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NEW LANDS PRODUCTIVITY

EGYPT

WORKING PAPERS

1 and 2

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 1

CROP BUDGETS AND FARM PLANS

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WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 1
CROP BUDGETS AND FARM PLANS

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WORKING PAPER NO. 1

CROP BUDGETS AND FARM PLANS

Crop Budgets

1.1 A large variety of crops can be grown in the New Lands. With top-level management, adequate fertilizer and careful irrigation methods, good yields are possible.

1.2 Only crops which are currently grown in the New Lands were considered in the study. It can be argued that introduction of new crops is reasonable to expect and perhaps could enhance the economic and financial returns. The experience of team members in many countries argues for caution regarding the speed at which new crops may be adopted in an area. In a closely controlled project -- such as is possible in a joint venture, for instance -- the adoption of new crops could take place fairly rapidly. Where large numbers of decision units (i.e., smallholders) are involved, it takes a very dramatic change in prospects to get a rapid adoption of a new crop. Examples can be cited where a new crop has come into an area fairly rapidly, such as soybeans in Brazil and sunflowers in several areas. But two factors argued against including a new crop component in the crop budgets for the feasibility analysis: (a) no readily apparent crop candidate exists that looks like it might take off in the near future (although speculation has been offered that several new crops are worthy of experimentation and may have future potential) and, (b) even if a suitable, dramatic new crop were found, it would take several years to get all the requisites (seed, know-how, extension, marketing, etc.) in place and the net effect on the IRR would be mitigated considerably.

1.3 The crop rotation used in the crop budgets is quite similar to the cropping patterns being used by farmers in the Tahaddi area. The team considered adopting a cropping pattern that on paper would give a higher net return, but ultimately concluded that farmers undoubtedly have good reasons for including certain crops in their rotations that show low returns on paper. They grow cereal grains for local food consumption. They grow fodder to feed their livestock and for soil building purposes. It did not seem prudent to assume that they will change markedly from existing patterns, without a

significant change in technology, extension efforts, or price policy.

1.4 Crop yields under existing conditions in the study area (South Tahrir/Tahaddi) are quite low. In developing crop budgets for the feasibility study, the team had to decide how much and how rapidly to deviate from existing yields and cropping patterns. Virtually no hard data existed on which to base judgments, either from on-farm experience in desert agriculture in Egypt or from experimental plots. This being the case, the study team had to estimate future yields, based on a combination of: (a) answers which farmers who were surveyed in the Tahaddi area gave to questions about yields of various crops during the previous year, (b) records of cooperatives in Tahaddi, (c) visual observations by team members of crop conditions over a period of three to four months, (d) discussions with agronomists and farm managers familiar with desert agriculture in Egypt and elsewhere, and (e) past and present yields in the Nile Valley and the Delta.

1.5 Recognizing the importance of yields in the calculations of rates of return, the team members invested considerable time in getting the best possible basis for the figures used. The team believes that the target yields assumed (which are considerably higher than any yields achieved so far on a commercial scale in the New Lands) are on the optimistic side, and that something less than the target yields is more likely to be obtained on the average in the New Lands.

1.6 Some people have expressed the feeling that average yields higher than those used in the calculations are likely. The burden of proof lies with those who are more optimistic. The team sincerely hopes that higher yields can be realized, and recommends that priority in any investments in the New Lands be given to action experiments which will show what yields are obtainable in the New Lands on a commercial scale using improved practices. If the yields obtained are significantly higher than those assumed by the present study, the rates of return can quickly be computed again using the new data.

1.7 Experience in the New Lands indicates that a difference in yields exists between the settlers, graduates, and joint venture farms. Average national yields and present yields for settlers, graduates, and joint venture farms in the Tahaddi area are shown in Table 1.1. The projected 1990 average national yields and

estimated ten year target yields for farms in the Tahaddi area are shown in Table 1.2. The yields for year one through year nine were estimated by using the parabolic curve formula $x = \sqrt{y}$ and the annual percentage increase is shown in Table 1.3.

1.8 Crop budgets were prepared to show projected yield, farm gate price, gross revenue, production input costs, labor costs, and net revenue for the crops to be considered for the area. The budgets were prepared using financial and economic prices for settlers, graduates and joint venture farms. Yields were projected to 125 percent above target yields and 87.5 and 75 percent below target yields. These projections were made for each of the three farm types and time phased for making a sensitivity analysis. (See Tables 1.4 through 1.19).

1.9 The need for mechanization for the small landholders would be for seedbed preparation. All other farming operations would be performed by hand labor. Production and harvesting operations for all crops grown by the joint venture farm would be mechanized.

1.10 Animal budgets were prepared for each of the different types of farms (Table 1.20). The animals budgeted for the joint venture farms were for slaughter. The amount of forage (fodder and berseem) allocated per animal for milk production was five metric tons on a dry matter basis. The amount of forage allocated per animal for slaughter was two metric tons on a dry matter basis. In addition to the forage for milk production, a concentrate feed was fed at the rate of .2 kg per kg of milk produced.

Farm Plans

1.11 The cropping pattern as found in the Tahaddi area for the small landholders is shown in Table 1.21. The major difference in the summer cropping pattern between the settlers and the graduates is in the area planted to maize, cowpeas, sesame and watermelons. In the winter cropping season the settlers planted 83 percent of their area to berseem and green peas while the graduates planted only 32 to 40 percent to these two crops. The graduates planted little or no wheat but planted a sizable area to barley. Table 1.21 also shows the cropping intensities of each farm size. The lower cropping pattern intensity of the graduates may be directly related to the insufficiency of water and farm labor. A financial and economic analysis of the area for the three types of farms are shown in Tables 1.22-1.27. A financial analysis

shows the advantage going to the settler farms while an economic analysis shows the advantage to be with the graduate farms. However, in neither analysis is the net revenue adequate to encourage farmers to stay on the land.

1.12 Tables 1.28 to 1.33 show the assumed farm size, cropping pattern, gross revenue, production input costs, labor costs and net revenue for the settler farm using both financial and economic prices. The projected cropping pattern does not vary significantly from the current cropping pattern. It does, however, show an increase in vegetable production over the development period. The net revenue from the five feddan farm does provide a minimum return to labor and management for year one and increases to an acceptable level at the end of the development period in the financial analysis. In the economic analysis, however, the return to management is almost zero in year one, but does increase significantly during the development period. Assuming a family labor supply of two man-year equivalents, the family would be fully employed on the five feddan farm (Tables 1.34 and 1.35). During the peak labor demand months the hours worked per day would have to be increased from a six-hour work day to a nine-hour work day. During the low labor demand months it would be possible for part of the labor force to work off the farm and earn additional income.

1.13 The size of the graduate farm is assumed to be 20 feddans which will have a 200 percent cropping intensity. The cropping pattern for field crops is very similar to the settler farm plan with one major exception -- one-half of the farm was assumed to be planted to tree crops. Eighty percent of the orchard area will be intercropped for the first two years; this will be reduced to 50 percent in years three, four and five. The farm plan of the graduate farm for the first five years shows trends toward commercial agriculture compared to the settler farm, (Tables 1.36 - 1.41): Graduates are planting a much higher percentage of their land to cash crops, such as peanuts and green peas, and a smaller percentage to family subsistence crops, such as maize and wheat. Sufficient area will be planted to fodder and berseem to maintain three milking animals, their calves, and three burros. These animals combined would constitute about four and one-half animal units. The return to management on the graduate farm at target yields is negative the first year, less than LE 500 in year five, but reaches a respectable level at end of development period, using financial prices. When using economic prices the return to management is still negative in year one. It becomes positive in year five and increases substantially by year ten, but is less

than that for the same time period when using financial prices. The labor force on the graduate farm was assumed to be three laborer families with two man-year equivalents in each family. The peak labor demand months are the same as those for the settler farm during years one through five, (Table 1.42). However, the peak demand months shift to the winter months beginning in year six (Table 1.43). This is the time period when labor demand on settler farms is lowest, making it possible for the graduate farm to utilize some of the underemployed labor in the area. A financial analysis was made on the graduate farm assuming no tree crops would be planted. The returns to management in years one to five are greater when the entire area is in field crops (Tables 1.44 - 1.46). The situation reverses itself when the tree crop comes into production. In year ten, the farm plan using tree crops shows the return to management to be more than twice than when no tree crops are planted.

1.14 The cropping pattern of the joint venture farm plan follows a three year rotation. During the summer months one-third of the area will be planted to each of the following crops, peanuts, vegetables, and fibrous root crops (corn and fodder). The winter crops are also divided into three equal groups, berseem, vegetables and barley. The fodder and berseem will be used as feed for fattening cattle. In the case of the joint venture farm it has been assumed that target yields will be attainable by year six. A study of Tables 1.47 - 1.52 shows that net revenue, returns to management and capital, are substantial even with the most pessimistic yields in both the financial and economic analysis. It should be pointed out, however, that the yields shown for the joint venture are based on limited observations and yields obtained from other countries with similar soils and the use of optimum production inputs and top management. If it is not possible to obtain these yields in the time frame assumed, net revenues will be severely affected.

National Average Yields and Present Yields
for Tahaddi Area by Crops

<u>Crops</u>	National Ave. Yields MT/fd ^{1/}	<u>Tahaddi Area</u>		
		Settlers MT/fd ^{2/}	Graduates MT/fd ^{2/}	Joint Venture MT/fd ^{3/}
Barley	1.11	.42	.43	.9
Berseem	6.5	6.9	5.8	15.0
Cowpeas (dry)	-	1.2	1.0	1.1
Fodder (sorghum)	-	11.3	9.1	15.6
Green Peas	-	1.08	.84	1.0
Green Pepper	6.9	1.0	.8	4.5
Lupines	.63	.45	.35	-
Maize	1.58	.45	.5	1.8
Onions	8.15	4.6	4.0	8.0
Peanuts	.88	.53	.51	1.0
Potatoes	7.0	1.2	1.0	12.0
Sesame	.54	.27	.24	.6
Tomatoes	6.7	3.0	2.0	11.0
Watermelons	11.16	2.7	2.4	-
Wheat	1.32	.68	.45	.9
Citrus	-	-	2.76	-

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- ^{1/} Suez Canal Region Integrated Agricultural Development Study EGY/76/001-6, Hunting Technical Services, April 1979.
- ^{2/} Tahaddi Field Survey (where estimates were based on a small sample, yields were adjusted on basis of judgement by Pacific Consultants).
- ^{3/} First Arabian feasibility studies and current estimates.

1990 Projected National Yields and Estimated
10-year Target Yields for Tahaddi Area by Crops

<u>Crops</u>	Projected National Ave. Yields MT/fd ^{1/}	Estimated 10-year target yields - Tahaddi		
		Settlers MT/fd ^{2/}	Graduates MT/fd ^{3/}	Joint Venture MT/fd ^{4/}
Barley	1.4	1.4	1.4	2.2
Berseem	-	10.56	9.6	18.0
Cowpeas, dry	-	1.28	1.12	1.6
Fodder, Sorghum	-	20.0	20.0	25.0
Green Peas	-	1.44	1.2	1.8
Green Pepper	9.8	5.1	4.3	6.4
Lupines	.9	.72	.56	-
Maize	2.57	1.6	1.6	3.0
Onions	9.24	7.4	6.2	14.0
Peanuts	1.0	.88	.8	1.4
Potatoes	10.0	8.0	6.8	12.0
Sesame	.82	.72	.64	.9
Tomatoes	9.3	7.2	4.8	12.0
Watermelon	15.9	12.7	10.8	-
Wheat	1.98	1.6	1.6	2.0
Citrus	-	-	6.4	-

- ^{1/} Projected 1990 National Average Yields using the average yield increase rate from 1950-54 to 1970-74.
- ^{2/} Estimated at 80% of projected 1990 average yield for onions, potatoes, tomatoes, watermelons, and wheat. Yields for other crops estimated on basis of judgement by Pacific Consultants.
- ^{3/} One hundred percent of settlers projected yields for grain and fodder crops, 90 percent for berseem and oilseed crops, 87.5% for cowpeas, 78% for lupines, and 85% for all vegetable crops except tomatoes which is 67%.
- ^{4/} First Arabian Company Feasibility Studies, Pepsi-Cola Farm test plot results and estimates by Pacific Consultants.

Annual Percentage Increase of Yields for
Small Landholders and Joint Venture Farms

<u>Year</u>	<u>Percentage Increase ^{1/}</u>	
	<u>Small Landholder</u>	<u>Joint Venture</u>
1	32	
2	45	55
3	55	63
4	63	78
5	71	90
6	78	100
7	84	
8	90	
9	95	
10	100	

1/ Percentage of the total yield improvement to be achieved in that year (zero = present yield, 100% = target yield),

Source: PC Team

Financial and Economic Crop Budgets
Citrus for 1 Feddan

Table 1.4

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE)			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75	(LE)	125	100	87.5	75	(LE)	(LE)	125	100	87.5	75
<u>Financial Prices</u>															
Graduates:															
Year 1	0	0	0	0	0	0	0	0	0	25	6	(33)	(33)	(33)	(33)
Year 5	1.0	0.8	0.7	0.6	80	80	64	56	48	56	57	(33)	(49)	(57)	(65)
Year 10	8.0	6.4	5.6	4.8		640	512	448	384	71	126	443	315	251	187
<u>Economic Prices</u>															
Graduates:															
Year 1	0	0	0	0	80	0	0	0	0	22	8	(30)	(30)	(30)	(30)
Year 5	1.5	.8	.7	.6		80	64	56	48	75	55	(50)	(66)	(74)	(82)
Year 10	8.0	6.4	5.6	4.8		640	512	448	384	131	126	383	255	191	127

Table 1.5

Financial and Economic Crop Budgets
Barley for 1 Feddan

	Yield (Mt) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected		Target			% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	.86	.73	.70	.61	75	56	47	46	41	26		30	21	20	15
Year 5	1.40	1.12	1.04	.89		91	73	68	58	32		59	41	36	26
Year 10	1.8	1.4	1.3	1.08		117	91	85	70	36		81	55	49	34
<u>Graduates:</u>															
Year 1	.87	.74	.71	.63	65	57	48	46	41	26	31	0	(9)	(11)	(16)
Year 5	1.40	1.12	1.05	.89		91	73	68	58	32	31	28	10	5	(5)
Year 10	1.8	1.4	1.3	1.08		117	91	85	70	36	31	50	24	18	2
<u>Joint Venture:</u>															
Year 1	.90	.72	.63	.54	65	59	47	41	35	35	11	13	1	(5)	(11)
Year 3	1.72	1.40	1.18	1.03		112	91	77	67	43	11	58	37	23	13
Year 6	2.20	1.8	1.5	1.32		143	117	98	86	47	11	85	59	40	28
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	.86	.73	.70	.63	125	107	91	87	79	40	41	26	10	6	(2)
Year 5	1.40	1.12	1.04	.89		175	140	130	111	59	41	75	40	30	11
Year 10	1.80	1.40	1.30	1.08		225	175	162	135	72	41	112	62	49	22
<u>Graduates:</u>															
Year 1	.87	.74	.71	.64	125	109	92	89	80	40	31	38	21	18	9
Year 5	1.40	1.12	1.05	.91		175	140	131	114	59	31	85	50	41	24
Year 10	1.80	1.40	1.30	1.10		225	175	162	138	72	31	122	72	59	35
<u>Joint Venture:</u>															
Year 1	.90	.72	.63	.54	125	112	90	79	68	53	11	48	26	15	4
Year 3	1.72	1.40	1.18	1.03		215	175	147	129	76	11	128	88	60	42
Year 6	2.20	1.81	1.50	1.32		275	226	187	165	96	11	168	119	80	58

Table 1.6

Financial and Economic Crop Budgets
Berseem for 1 Feddan

	Yield (MI) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	8.92	8.07	7.65	10.1	10	89	81	77	72	23		66	58	54	49
Year 5	11.37	9.50	8.56	7.6		114	95	86	76	27		87	68	59	49
Year 10	13.20	10.56	9.24	7.92		132	106	92	79	29		103	77	63	50
<u>Graduates:</u>															
Year 1	7.78	7.02	6.63	6.25	10	78	70	66	63	23	45	10	2	(2)	(5)
Year 5	10.20	8.50	7.65	6.79		102	85	77	68	25	45	32	15	7	(2)
Year 10	12.00	9.60	8.40	7.2		120	96	84	72	27	45	48	24	12	0
<u>Joint Venture:</u>															
Year 1	15.00	12.00	10.50	9.0	10	150	120	105	90	56	12	82	52	37	22
Year 3	16.89	13.51	11.83	10.1		169	135	118	101	58	12	99	65	48	31
Year 6	18.00	14.40	12.60	10.8		180	144	126	108	59	12	109	73	55	37
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	8.9	8.1	7.7	7.2	10	89	81	77	72	36	59	(6)	(14)	(18)	(23)
Year 5	11.4	9.5	8.6	7.6		114	95	86	76	49	59	6	(13)	(22)	(32)
Year 10	13.2	10.6	9.2	7.9		132	106	92	79	57	59	16	(10)	(24)	(37)
<u>Graduates:</u>															
Year 1	7.8	7.0	6.6	6.2	10	78	70	66	62	34	45	(1)	(9)	(13)	(17)
Year 5	10.2	8.5	7.7	6.8		102	85	77	68	46	45	11	(6)	(14)	(23)
Year 10	12.0	9.6	8.4	7.2		120	96	84	72	53	45	22	(2)	(14)	(45)
<u>Joint Venture:</u>															
Year 1	15.0	12.0	10.5	9.0	10	150	120	105	90	88	12	50	20	5	(10)
Year 3	16.9	13.5	11.8	10.1		169	135	118	101	99	12	58	24	7	(10)
Year 6	18.0	14.4	12.6	10.8		180	144	126	108	109	12	59	23	5	(13)

Table 1.7

Financial and Economic Crop Budgets
Cowpeas for 1 Feddan

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	1.33	1.09	1.2	1.2	50	66	55	60	60	28		38	27	32	32
Year 5	1.48	1.2	1.2	1.2		74	63	60	60	29		45	34	32	32
Year 10	1.6	1.28	1.2	1.2		80	64	60	60	30		50	34	30	30
<u>Graduates:</u>															
Year 1	1.13	1.04	1.0	1.2	50	55	52	50	50	31	35	(11)	(14)	(16)	(16)
Year 5	1.28	1.04	1.0	1.2		64	54	50	50	32	35	(3)	(13)	(17)	(17)
Year 10	1.4	1.12	1.0	1.0		70	56	50	50	33	35	2	(12)	(18)	(18)
<u>Joint Venture:</u>															
Year 1	1.1	.88	.77	.66	50	55	44	39	33	33	11	11	0	(5)	(11)
Year 3	1.42	1.13	.99	.85		71	57	50	43	35	11	25	11	4	(3)
Year 6	1.6	1.28	1.12	.96		80	64	56	48	36	11	33	17	9	1
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	1.33	1.09	1.2	1.2	50	66	55	60	60	44	46	(24)	(35)	(30)	(30)
Year 5	1.48	1.20	1.2	1.2		74	63	60	60	54	46	(26)	(37)	(40)	(40)
Year 10	1.6	1.28	1.2	1.2		80	64	60	60	59	46	(25)	(41)	(45)	(45)
<u>Graduates:</u>															
Year 1	1.13	1.04	1.0	1.2	50	55	52	50	50	49	35	(29)	(32)	(34)	(34)
Year 5	1.28	1.04	1.0	1.2		64	54	50	50	59	35	(30)	(40)	(44)	(44)
Year 10	1.4	1.12	1.0	1.2		70	56	50	50	64	35	(29)	(43)	(49)	(49)
<u>Joint Venture:</u>															
Year 1	1.1	.88	.77	.66	50	55	44	39	33	57	11	(13)	(24)	(29)	(35)
Year 3	1.42	1.13	.99	.85		71	57	50	43	67	11	(7)	(21)	(28)	(35)
Year 6	1.6	1.28	1.12	.96		80	64	56	48	76	11	(7)	(23)	(31)	(39)

Table 1.8

Financial and Economic Crop Budgets

Fodder for 1 Feddan

	Yield (MT) as % of				Farmgate Price (L.E)	Gross Revenue (L.E) as				Pro- duction Input Costs (L.E)	Labor Costs (L.E)	Net Revenue (L.E) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
Financial Prices															
Settlers:															
Year 1	15.6	14.1	13.3	12.5	7	109	99	93	88	36		73	63	57	52
Year 5	21.0	17.5	15.7	13.9		147	123	110	97	42		105	81	68	55
Year 10	25.0	20.0	17.5	15.0		175	140	123	105	46		129	94	77	59
Graduates:															
Year 1	14.1	12.6	11.8	11.0	7	99	88	83	77	35	41	23	12	7	1
Year 5	20.3	16.8	15.1	13.3		142	118	106	93	41	41	60	36	24	11
Year 10	25.0	20.0	17.5	15.0		175	140	123	105	46	41	88	53	36	18
Joint Venture:															
Year 1	15.6	12.5	10.9	9.4	7	109	88	76	66	56	12	41	20	8	(2)
Year 3	21.5	17.2	15.1	12.9		151	120	106	90	63	12	76	45	31	15
Year 6	25.0	20	17.5	15		175	140	123	105	66	12	97	62	45	27
Economic Prices															
Settlers:															
Year 1	15.6	14.1	13.3	12.5	7	109	99	93	88	59	50	0	(10)	(16)	(21)
Year 5	21.0	17.5	15.7	13.9		147	122	110	97	82	50	15	(10)	(22)	(35)
Year 10	25.0	20.0	17.5	15.0		175	140	122	105	96	50	29	(6)	(24)	(41)
Graduates:															
Year 1	14.1	12.6	11.8	11.0	7	99	88	83	77	56	41	2	(9)	(14)	(20)
Year 5	20.3	16.8	15.1	13.3		142	118	106	93	80	41	21	3	(15)	(28)
Year 10	25.0	20.0	17.5	15.0		175	140	122	105	96	41	38	3	(15)	(32)
Joint Venture:															
Year 1	15.6	12.5	10.9	9.4	7	200	87	76	66	89	12	99	(14)	(25)	(35)
Year 3	21.5	17.2	15.1	12.9		150	120	105	90	109	12	29	(1)	(16)	(31)
Year 6	25.0	20	17.5	15		175	140	122	105	126	12	37	2	(16)	(33)

Table 1.9

Financial and Economic Crop Budgets
Green Peas for 1 Feddan

	Yield (M ³) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	1.31	1.2	1.14	1.08	134	176	161	153	145	48		128	113	105	97
Year 5	1.59	1.34	1.21	1.08		213	180	162	145	50		163	130	112	95
Year 10	1.8	1.44	1.26	1.08		241	193	169	145	52		189	141	117	93
<u>Graduates:</u>															
Year 1	1.05	.96	.91	.86	134	141	129	122	115	46	63	32	20	13	6
Year 5	1.31	1.1	.99	.88		176	147	133	118	48	63	65	36	22	7
Year 10	1.5	1.2	1.05	.9		201	161	141	121	50	63	88	48	28	8
<u>Joint Venture:</u>															
Year 1	1.0	.80	.70	.60	134	134	107	94	80	57	43	34	7	(6)	(20)
Year 3	1.5	1.2	1.05	.82		201	161	141	110	61	43	97	57	37	6
Year 6	1.8	1.44	1.26	1.08		241	193	169	145	63	43	135	87	63	39
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	1.31	1.2	1.75	1.08	134	176	161	153	145	67	81	28	13	5	(3)
Year 5	1.59	1.34	1.21	1.08		213	180	162	145	78	81	54	22	3	(14)
Year 10	1.80	1.44	1.26	1.08		241	193	168	145	84	89	68	20	(5)	(28)
<u>Graduates:</u>															
Year 1	1.05	.96	.91	.86	134	141	129	122	115	67	63	11	(1)	(8)	(15)
Year 5	1.31	1.10	.99	.88		176	147	132	118	78	63	35	6	(9)	(23)
Year 10	1.5	1.2	1.05	.90		201	161	140	121	84	63	54	14	(7)	(26)
<u>Joint Venture:</u>															
Year 1	1.00	.80	.70	.6	134	134	107	94	80	74.4	43	17	(10)	(23)	(37)
Year 3	1.50	1.20	1.05	.82		201	161	141	110	85.8	43	72	32	12	(19)
Year 6	1.80	1.44	1.26	1.08		241	193	169	145	96.0	43	102	54	30	6

Table 1.10

Financial and Economic Crop Budgets
Green Pepper for 1 Feddan

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected		Target			% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
Financial Prices															
Settlers:															
Year 1	2.7	2.3	2.1	1.9	50	135	115	105	95	42		93	73	63	53
Year 5	4.8	3.9	3.5	3.0		240	195	175	150	49		191	146	126	101
Year 10	6.4	5.1	4.5	3.8		320	255	225	190	55		265	200	170	135
Graduates:															
Year 1	2.3	1.9	1.8	1.6	50	115	95	90	80	41	74	0	(20)	(25)	(35)
Year 5	4.1	3.3	2.9	2.5		205	165	145	125	47	75	118	78	58	38
Year 10	5.4	4.3	3.8	3.2		270	215	190	160	51	81	138	83	58	28
Joint Venture:															
Year 1	4.5	3.6	3.2	2.7	50	225	180	160	135	132	46	47	2	(16)	(43)
Year 3	5.7	4.5	4.0	3.4		285	225	200	170	136	55	94	34	9	(21)
Year 6	6.4	5.1	4.5	3.8		320	255	225	190	138	59	123	58	28	(7)
Economic Prices															
Settlers:															
Year 1	2.7	2.3	2.1	1.9	50	135	115	105	95	56	93	(14)	(34)	(44)	(54)
Year 5	4.8	3.9	3.5	3.0		240	195	175	150	81	94	65	20	0	(25)
Year 10	6.4	5.1	4.5	3.8		320	255	225	190	99	101	120	55	25	(10)
Graduates:															
Year 1	2.3	1.9	1.8	1.6	50	115	95	90	80	53	74	(12)	(32)	(37)	(47)
Year 5	4.1	3.3	2.9	2.5		205	165	145	125	74	75	56	16	(4)	(24)
Year 10	5.4	4.3	3.8	3.1		270	215	190	160	89	81	100	45	20	(10)
Joint Venture:															
Year 1	4.5	3.6	3.2	2.7	50	225	180	160	135	171	46	8	(37)	(57)	(82)
Year 3	5.7	4.5	4.0	3.4		285	225	200	170	186	55	44	(16)	(41)	(71)
Year 6	6.4	5.1	4.5	3.8		320	255	225	190	200	59	61	(4)	(34)	(69)

Financial and Economic Crop Budgets
Lupines for 1 Feddan

Table 1.11

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected	100	87.5	75		% of Target	125	100	87.5			75	% of Target	125	100
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	.59	.54	.51	.48	250	147	135	127	119	27		120	108	100	92
Year 5	.77	.64	.58	.51		192	160	145	128	29		163	131	116	99
Year 10	.90	.72	.63	.54		225	180	157	135	30		195	150	127	105
<u>Graduates:</u>															
Year 1	.46	.42	.39	.37	250	115	105	97	91	29	37	52	42	34	28
Year 5	.60	.50	.44	.40		150	125	110	100	27	37	86	61	46	36
Year 10	.70	.56	.49	.42		175	140	122	105	28	37	110	75	57	40
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	.59	.54	.51	.48	250	147	135	127	120	35	48	64	52	44	37
Year 5	.77	.64	.58	.51		192	160	145	128	43	48	101	69	54	37
Year 10	.90	.72	.63	.54		225	180	157	135	46	48	131	86	63	41
<u>Graduates:</u>															
Year 1	.46	.42	.39	.37	250	115	105	97	93	35	37	43	33	25	21
Year 5	.60	.50	.44	.40		150	125	110	100	43	37	70	45	30	20
Year 10	.70	.56	.49	.42		175	140	122	105	46	37	92	57	39	22

Financial and Economic Crop Budgets
Maize for 1 Feddan

Table 1.12

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected		Target			% of Target		% of Target				% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
Financial Prices															
Settlers:															
Year 1	.95	.82	.75	.69	82	78	67	62	57	28		50	39	34	29
Year 5	1.55	1.27	1.12	.98		127	104	92	80	34		93	70	58	46
Year 10	2.00	1.60	1.40	1.2		164	131	115	98	39		125	92	76	59
Graduates:															
Year 1	.98	.85	.79	.72	82	80	70	65	59	24	48	8	(2)	(7)	(13)
Year 5	1.57	1.28	1.14	1.0		129	105	93	82	34	48	47	23	11	0
Year 10	2.0	1.60	1.40	1.2		164	131	115	98	39	48	77	44	28	11
Joint Venture:															
Year 1	1.80	1.44	1.26	1.08	82	148	118	103	89	48	11	89	59	44	30
Year 3	2.56	2.04	1.79	1.54		210	167	147	126	55	11	144	101	81	60
Year 6	3.00	2.40	2.10	1.8		246	197	172	148	60	11	175	126	101	77
Economic Prices															
Settlers:															
Year 1	.95	.82	.75	.69	132	125	108	99	91	43	61	21	4	(5)	(13)
Year 5	1.55	1.27	1.12	.98		205	168	148	129	64	61	80	43	23	4
Year 10	2.00	1.60	1.40	1.2		264	211	185	158	79	61	124	71	45	18
Graduates:															
Year 1	.98	.85	.79	.72	132	129	112	104	95	43	48	38	21	13	4
Year 5	1.57	1.28	1.14	1.0		207	169	150	132	65	48	94	56	37	19
Year 10	2.00	1.60	1.40	1.2		264	211	185	158	79	48	137	84	58	31
Joint Venture:															
Year 1	1.80	1.44	1.26	1.08	132	238	190	166	143	80	11	147	99	75	52
Year 3	2.56	2.04	1.79	1.54		338	269	236	203	104	11	223	154	121	88
Year 6	3.00	2.40	2.10	1.80		396	317	277	238	126	11	259	180	140	101

Financial and Economic Crop Budgets
Onions for 1 Feddan

Table 1.13

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected		Target			% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
Financial Prices															
Settlers:															
Year 1	6.07	5.50	5.18	4.89	60	364	330	311	294	66		298	264	245	228
Year 5	7.87	6.59	5.88	5.25		472	395	353	315	71		401	324	282	244
Year 10	9.2	7.4	6.4	5.52		552	444	384	331	74		478	370	310	257
Graduates:															
Year 1	5.22	4.70	4.48	4.22	60	313	282	269	253	64	104	145	114	101	85
Year 5	6.70	5.56	5.07	4.48		402	334	304	269	68	112	222	154	124	89
Year 10	7.8	6.2	5.5	4.68		468	372	330	281	70	118	280	184	142	93
Joint Venture:															
Year 1	8	6.4	5.6	4.8	60	480	384	336	288	199	15	266	170	122	74
Year 3	11.8	9.4	8.3	7.1		708	566	496	425	210	15	483	341	271	200
Year 6	14	11.2	9.8	8.4		840	672	588	504	215	15	610	442	358	274
Economic Prices															
Settlers:															
Year 1	6.07	5.50	5.18	4.89	60	364	330	311	293	89	130	145	111	92	74
Year 5	7.87	6.59	5.88	5.25		472	395	353	315	110	140	222	145	103	65
Year 10	7.2	7.4	6.4	5.52		552	444	384	331	123	148	281	173	113	60
Graduates:															
Year 1	5.2	4.70	4.48	4.22	60	313	282	269	253	89	104	120	89	76	60
Year 5	6.70	5.56	5.07	4.48		402	334	304	269	110	112	180	112	82	47
Year 10	7.8	6.2	5.5	4.68		468	372	330	281	123	118	227	131	89	40
Joint Venture:															
Year 1	8.0	6.4	5.6	4.8	60	480	384	336	288	270	15	195	99	51	3
Year 3	11.8	9.4	8.3	7.1		708	564	498	426	302	15	391	247	181	109
Year 6	14.0	11.2	9.8	8.4		840	672	588	504	330	15	495	327	243	159

Financial and Economic Crop Budgets

Table 1.14

Peanuts for 1 Feddan

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	.71	.64	.61	.57	267	190	171	163	153	79		111	92	84	74
Year 5	.93	.78	.70	.62		248	208	187	166	82		166	126	105	84
Year 10	1.10	.88	.77	.66		294	235	206	176	84		210	151	122	92
<u>Graduates:</u>															
Year 1	.67	.60	.57	.54	267	179	160	152	144	79	67	33	14	6	(2)
Year 5	.86	.72	.64	.57		230	192	171	153	81	72	77	39	78	0
Year 10	1.00	.80	.70	.60		267	214	187	160	82	75	110	57	30	3
<u>Joint Venture:</u>															
Year 1	1.00	.80	.70	.60	267	267	214	187	160	99	12	156	103	76	49
Year 3	1.25	1.00	.88	.75		334	267	235	200	102	12	220	153	121	86
Year 6	1.40	1.12	.98	.84		374	299	262	224	103	12	259	184	147	109
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	.71	.64	.61	.57	387	275	248	236	221	92	86	97	70	58	43
Year 5	.93	.78	.70	.62		360	302	271	240	103	92	165	107	76	45
Year 10	1.10	.88	.77	.66		426	341	298	255	110	97	219	134	91	48
<u>Graduates:</u>															
Year 1	.67	.60	.57	.54	387	259	232	221	209	92	67	100	73	62	50
Year 5	.86	.72	.64	.57		333	279	248	221	103	72	158	104	73	46
Year 10	1.00	.80	.70	.60		387	310	271	232	110	75	202	125	86	47
<u>Joint Venture:</u>															
Year 1	1.00	.80	.70	.60	387	387	310	271	232	124	12	251	174	135	96
Year 3	1.25	1.00	.88	.75		484	387	341	290	134	12	338	241	195	144
Year 6	1.40	1.12	.98	.84		542	433	379	325	145	12	385	276	222	168

Financial and Economic Crop Budgets
Potatoes for 1 Feddan

Table 1.15

	Yield (MT) as % of				Harvest Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
Settlers:															
Year 1	4.0	3.4	3.1	2.7	60	240	204	186	162	226		14	22	40	64
Year 5	7.4	6.0	5.3	4.6		444	360	318	276	242		202	118	76	34
Year 10	10.0	8.0	7.0	6.0		600	480	420	360	255		345	225	165	105
Graduates:															
Year 1	3.4	2.9	2.6	2.3	60	204	174	156	138	223	70	(89)	(119)	(137)	(155)
Year 5	6.3	5.1	4.6	3.9		378	306	276	234	237	73	68	(4)	(34)	(76)
Year 10	8.5	6.8	6.0	5.1		510	408	360	306	248	77	185	83	35	0.9
Joint Venture:															
Year 1	12	9.6	8.4	7.2	60	720	576	504	432	278	13	429	285	213	141
Year 3	12	9.6	8.4	7.2		720	576	504	432	278	13	429	285	213	141
Year 6	12	9.6	8.4	7.2		720	576	504	432	278	13	429	285	213	141
<u>Economic Prices</u>															
Settlers:															
Year 1	4.0	3.4	3.1	2.7	60	240	204	186	162	254	88	(102)	(138)	(156)	(180)
Year 5	7.4	6.0	5.3	4.6		444	360	318	276	311	99	34	(50)	(92)	(134)
Year 10	10.0	8.0	7.0	6.0		600	480	420	360	353	119	128	8	(52)	(112)
Graduates:															
Year 1	3.4	2.9	2.6	2.3		204	174	156	138	247	70	(113)	(143)	(161)	(179)
Year 5	6.3	5.1	4.6	3.9		378	306	276	234	296	73	9	(63)	(93)	(135)
Year 10	8.5	6.8	6.0	5.1		510	408	360	306	331	77	102	0	(48)	(102)
Joint Venture:															
Year 1	12	9.6	8.4	7.2	60	720	576	504	432	306	13	401	257	185	113
Year 3	12	9.6	8.4	7.2		720	576	504	432	322	13	385	241	169	97
Year 6	12	9.6	8.4	7.2		720	576	504	432	341	13	366	222	150	78

Financial and Economic Crop Budgets
Sesame for 1 Feddan

Table 1.16

	Yield (MT) as % of Projected Target				Farmgate Price (LE)	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	.47	.41	.39	.36	415	195	170	182	149	16		179	154	146	133
Year 5	.72	.59	.53	.46		299	245	220	191	18		281	227	202	173
Year 10	.90	.72	.63	.54		374	299	261	224	20		354	279	241	204
<u>Graduates:</u>															
Year 1	.42	.37	.34	.32	415	174	154	141	133	15	41	118	98	85	77
Year 5	.64	.52	.47	.41		266	216	195	170	17	41	208	158	137	112
Year 10	.80	.64	.56	.48		332	266	232	199	19	41	272	206	172	139
<u>Joint Venture:</u>															
Year 1	.60	.48	.42	.36	415	249	199	174	149	29	11	209	159	134	109
Year 3	.79	.63	.55	.49		328	261	228	203	31	11	286	219	186	161
Year 6	.90	.72	.63	.54		374	299	261	224	32	11	331	256	218	181
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	.47	.41	.39	.36	415	195	170	162	149	24	51	126	95	87	74
Year 5	.72	.59	.53	.46		299	245	220	191	34	51	214	160	135	106
Year 10	.90	.72	.63	.54		374	299	261	224	40	51	283	208	170	183
<u>Graduates:</u>															
Year 1	.42	.37	.34	.32	415	174	154	141	133	23	41	110	90	77	69
Year 5	.64	.52	.47	.41		266	216	195	170	31	41	194	144	123	98
Year 10	.80	.64	.56	.48		332	266	232	199	37	41	254	188	154	125
<u>Joint Venture:</u>															
Year 1	.60	.48	.42	.36	415	249	199	174	149	46	11	192	142	117	92
Year 5	.79	.63	.55	.49		328	261	228	203	52	11	265	198	165	140
Year 6	.90	.72	.63	.54		374	299	261	224	58	11	305	230	192	155

Financial and Economic Crop Budgets
Tomatoes for 1 Feddan

Table 1.17

	Yield (MT) as % of				Irrigate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected		Target			% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	4.9	4.3	4.1	3.8	59	289	254	242	224	98		191	156	144	126
Year 5	7.3	6.0	5.3	4.7		431	354	313	277	106		325	248	207	171
Year 10	9.0	7.2	6.3	5.4		531	425	372	319	112		419	313	260	207
<u>Graduates:</u>															
Year 1	3.3	2.9	2.7	2.5	59	195	171	159	148	91	109	(5)	(29)	(41)	(52)
Year 5	4.8	4.0	3.6	3.1		283	236	212	183	97	109	7	30	6	23
Year 10	6.0	4.8	4.2	3.6		354	283	248	212	101	117	136	65	30	6
<u>Joint Venture:</u>															
Year 1	11.0	8.8	7.7	6.6	59	649	519	454	389	322	18	309	179	114	49
Year 3	11.6	9.3	8.1	6.9		684	549	477	407	324	18	342	207	135	65
Year 6	12.0	9.6	8.4	7.2		708	566	494	425	326	18	364	222	152	81
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	4.9	4.3	4.1	3.8	59	289	254	242	224	121	125	43	8	(4)	(22)
Year 5	7.3	6.0	5.3	4.7		431	354	313	277	153	128	150	73	32	(4)
Year 10	9.0	7.2	6.3	5.4		531	425	372	319	174	145	212	106	53	0
<u>Graduates:</u>															
Year 1	3.3	2.9	2.7	2.5	59	195	171	159	148	109	109	(23)	(47)	(59)	(70)
Year 5	4.8	4.0	3.6	3.1		283	236	212	183	129	109	45	(2)	(26)	(55)
Year 10	6.0	4.8	4.2	3.6		354	283	248	212	143	117	94	23	(12)	(48)
<u>Joint Venture:</u>															
Year 1	11.0	8.8	7.7	6.6	59	649	519	454	389	421	18	210	80	15	(50)
Year 3	11.6	9.3	8.1	6.9		684	549	477	407	437	18	229	94	22	(48)
Year 6	12.0	9.6	8.4	7.2		708	566	496	425	455	18	235	93	23	(46)

Financial and Economic Crop Budgets
Watermelons for 1 Feddan

Table 1.18

	Yield (MT) as % of				Farmgate Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected	Target	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
<u>Settlers:</u>															
Year 1	6.9	5.9	5.4	4.9	50	345	295	270	244	65		280	230	205	179
Year 5	12.1	9.8	8.7	7.6		605	490	435	378	83		522	407	352	295
Year 10	15.9	12.7	11.1	9.5		795	635	555	477	96		699	539	459	381
<u>Graduates:</u>															
Year 1	6.0	5.1	4.6	4.2	50	300	255	230	211	62	55	183	138	113	94
Year 5	10.3	8.4	7.4	6.45		515	420	370	322	76	55	384	289	239	191
Year 10	13.5	10.8	9.4	8.1		675	540	470	405	87	60	528	393	323	258
<u>Economic Prices</u>															
<u>Settlers:</u>															
Year 1	6.9	5.9	5.4	4.9	50	345	295	270	244	97	68	180	130	105	79
Year 5	12.1	9.8	8.7	7.6		605	490	435	378	160	69	376	261	206	149
Year 10	15.9	12.7	11.1	9.5		795	635	555	477	203	74	518	358	278	200
<u>Graduates:</u>															
Year 1	6.0	5.1	4.6	4.2	50	300	255	230	211	90	55	155	110	85	66
Year 5	10.3	8.4	7.4	6.45		515	420	370	322	143	56	316	221	171	123
Year 10	13.5	10.8	9.4	8.1		675	540	470	405	179	60	436	301	231	166

Table 1.19

Financial and Economic Crop Budgets
Wheat For 1 Feddan

	Yield (MT) as % of				Fertilizer Price (LE)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
Financial Prices															
Settlers:															
Year 1	1.10	.97	.91	.85	63	69	61	57	54	30		39	31	27	24
Year 5	1.6	1.3	1.2	1.05		101	82	76	66	35		66	47	41	31
Year 10	2.00	1.6	1.4	1.2		126	101	88	76	39		87	62	49	37
Graduates:															
Year 1	.9	.81	.75	.69	63	57	51	47	43	28	31	(2)	(8)	(12)	(16)
Year 5	1.55	1.26	1.1	.98		98	79	69	62	34	31	33	14	4	(3)
Year 10	2.0	1.6	1.4	1.2		126	101	88	76	39	31	56	31	18	6
Joint Venture:															
Year 1	.9	.72	.63	.54	63	57	45	40	34	32	11	14	2	(3)	(9)
Year 3	1.6	1.3	1.1	.96		101	82	69	60	39	11	50	37	19	10
Year 6	2.0	1.6	1.4	1.2		126	101	88	76	43	11	72	47	34	22
Economic Prices															
Settlers:															
Year 1	1.10	.97	.91	.85	147	162	143	134	125	46	41	75	56	47	38
Year 5	1.61	1.33	1.19	1.05		237	195	175	154	66	41	130	88	68	47
Year 10	2.00	1.60	1.40	1.2		294	235	206	176	79	41	174	115	86	56
Graduates:															
Year 1	.94	.81	.75	.69	147	138	119	110	101	46	31	61	42	33	24
Year 5	1.50	1.30	1.10	.98		220	191	162	144	66	31	123	94	65	47
Year 10	2.00	1.60	1.40	1.2		294	235	206	176	79	31	184	125	96	66
Joint Venture:															
Year 1	.90	.72	.63	.54	147	132	106	93	79	50	11	71	45	32	18
Year 3	1.60	1.30	1.10	.86		235	191	162	141	91	11	133	89	60	39
Year 6	2.00	1.60	1.40	1.2		294	235	206	176	88	11	195	136	107	77

Financial and Economic Animal Budget

Table 1.20

	Yield (Kg) as % of				Farmgate Price (Kg)	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
	Projected Target					% of Target						% of Target			
	125	100	87.5	75		125	100	87.5	75			125	100	87.5	75
<u>Financial Prices</u>															
Settlers:															
Year 1	2000	1600	1400	1200	.1	305	265	245	225	136		169	129	109	89
Year 5	3197	2558	2238	1918	(milk)	425	361	329	297	139		286	222	190	158
Year 10	3900	3120	2730	2340		495	417	378	339	90		405	327	288	249
Graduates:															
Year 1	2000	1600	1400	1200	.1	305	265	245	225	136	101	68	28	8	(12)
Year 5	3197	2558	2238	1918	(milk)	425	361	329	297	139	101	185	121	89	57
Year 10	3900	3120	2730	2340		495	417	379	339	90	101	304	226	188	148
Joint Venture:															
Year 1	375	300	263	225	.7	263	210	184	158	110	5	119	95	83	71
Year 3	424	339	297	254	(beef)	297	237	208	179	124	6	134	107	94	80
Year 6	450	360	316	270		316	252	221	190	132	6	143	114	100	86
<u>Economic Price</u>															
Settlers:															
Year 1	2000	1600	1400	1200	.1	264	224	204	184	62	101	101	61	41	21
Year 5	3197	2558	2238	1918	(milk)	384	320	288	256	68	101	215	151	119	87
Year 10	3900	3120	2730	2340		454	376	337	298	70	101	283	205	166	127
Graduates:															
Year 1	2000	1600	1400	1200	.1	264	224	204	184	62	101	101	61	41	21
Year 5	3197	2558	2238	1918	(milk)	384	320	288	256	68	101	215	151	119	87
Year 10	3900	3120	2730	2340		454	376	337	298	70	101	283	205	166	127
Joint Venture:															
Year 1	375	300	263	225	.425	160	128	112	96	69	5	68	54	47	41
Year 3	424	339	297	254	(beef)	181	145	127	108	78	6	77	61	53	46
Year 6	450	360	316	270		192	154	134	115	83	6	82	65	56	49

Table 1.21

Cropping Patterns of Farmers
in Tahaddi Area - 1979 ^{1/}

<u>Crops</u>	<u>Settlers</u>		<u>Graduates</u>			
	<u>Feddans</u> <u>Farmed</u>	<u>Crop</u> <u>Percent</u>	<u>University</u>		<u>Secondary</u>	
			<u>Feddans</u> <u>Farmed</u>	<u>Crop</u> <u>Percent</u>	<u>Feddans</u> <u>Farmed</u>	<u>Crop</u> <u>Percent</u>
Summer :						
Peanuts	1618	46.7	3552	46.6	2984	54.7
Maize	1261	36.4	320	4.2	376	6.9
Cowpeas	419	12.1	-	-	-	-
Vegetables	83	2.4	76	1.0	142	2.6
Sesame	-	-	313	4.1	644	11.8
Watermelons	-	-	564	7.4	595	10.9
Winter :						
Berseem	1334	38.5	1201	15.8	1097	20.1
Green Peas	1545	44.6	1238	16.2	1108	20.3
Vegetables	52	1.5	114	1.5	16	.3
Wheat	211	6.1	61	.8	-	-
Lupines	315	9.1	617	8.1	267	4.9
Barley	-	-	1105	14.5	1942	35.6
Permanent :						
Citrus			1666 ^{1/}	21.9	366 ^{1/}	6.7
Total Cropped						
Area	6838	-	10827	-	9537	-
Area in Farms	3465	-	7622	-	5456	-
Cropping						
Intensity	-	197.4	-	142.1	-	174.8

^{1/} Feddans in permanent crop were counted twice for summer and winter cropping patterns.

FINANCIAL ANALYSIS OF SETTLERS' FARMS, 1979

Table 1.22

3465 Feddans - Cropping Intensity 197.34%

	Yield, MT/Fd	Financial Price, LE/MT	Area, Feddans	Gross Revenue, LE 1000/Arca	Input Costs, LE/Fd	Input Costs, LE 1000/Arca	Labor Costs, LE/Fd	Labor Costs, LE 1000/Arca	Net Revenue, LE 1000/Arca
Summer:									
Peanuts	.53	267	1618	229	77	125	-	-	104
Maize	.45	82	1261	103	23	29	-	-	74
Cowpeas	1.2	50	419	25	27	11	-	-	14
Vegetables ^{a/}	3.0	59	83	15	91	8	-	-	7
Winter:									
Beræem	6.9	10	1334	92	22	29	-	-	63
Green Peas	1.08	134	1545	224	47	73	-	-	151
Vegetables ^{a/}	3.0	59	52	9	91	5	-	-	4
Wheat	.68	63	211	9	26	5	-	-	4
Lupins	.45	250	315	35	26	8	-	-	27
Total	-	-	6838	741	-	293	-	-	448

^{a/} Tomatoes used as representative vegetable crop.

FINANCIAL ANALYSIS OF SECONDARY GRADUATES' FARMS, 1979

Table 1.23

5456 Feddans - Cropping Intensity 174.8%

Crops	Yield, mt/ha	Financial	Area, Feddans	Yield, LE 1000/Area	Input	Input	Labor	Labor	Net
		Price, S/mt			Costs, LE/ha	Costs, LE 1000/Area	Costs, LE/ha	Costs, LE 1000/Area	Value, LE 1000/Area
Summer:									
Peanuts	.51	267	2984	406	77	230	63	188	(12)
Maize	.5	82	376	15	24	9	48	18	(12)
Vegetables ^{a/}	2.0	59	142	17	88	12	109	15	(10)
Sesame	.24	415	644	64	14	9	41	26	29
Watermelons	2.4	50	595	71	49	29	55	33	9
Winter:									
Berseem	5.8	10	1097	63	20	22	45	49	(8)
Green Peas	.84	134	1108	125	45	50	63	70	5
Vegetables ^{a/}	2.0	59	16	2	88	1	109	2	(1)
Lupins	.35	250	267	23	25	7	37	10	6
Barley	.43	65	1942	54	22	43	31	60	(49)
Permanent:									
Citrus	2.76	80	183	40	52	10	88	16	14
Total	-	-	9354	880	-	422	-	487	(29)

^{a/} Tomatoes used as representative vegetable crop.

FINANCIAL ANALYSIS OF UNIVERSITY GRADUATES' FARMS, 1979

Table 1.24

7622 Feddans - Cropping Intensity 142%

Crops	Yield, MT/Fd	Financial Price, LE/MT	Area, Feddans	Gross Revenue, LE 1000/Area	Input Costs, LE 1000/Area	Input Costs, LE 1000/Area	Labor Costs, LE/Fd	Labor Costs, LE 1000/Area	Net Revenue, LE 1000/Area
Summer:									
Peanuts	.51	267	3552	484	77	274	.63	224	(14)
Maize	.5	82	320	13	24	8	48	15	(10)
Vegetables ^{a/}	2.0	59	76	9	88	7	109	8	(6)
Sesame	.24	415	313	31	14	4	41	13	14
Watermelons	2.4	50	564	68	49	28	55	31	9
Winter:									
Berseem	5.8	10	1201	70	20	24	45	54	(8)
Green Peas	.84	134	1238	139	45	56	63	78	5
Vegetables ^{a/}	2.0	59	114	13	88	10	109	12	(9)
Wheat	.45	63	61	2	23	1	31	2	(1)
Lupins	.35	250	617	54	25	15	37	23	16
Barley	.43	65	1105	31	22	24	31	34	(27)
Permanent:									
Citrus	2.76	80	833	184	52	43	88	73	68
Total	-	-	9994	1098	-	494	-	567	37

^{a/} Tomatoes used as representative vegetable crop.

ECONOMIC ANALYSIS OF SETTLER FARMS, 1979
3465 Feddans - Cropping Intensity 197.34%

Table 1.25

Crops	Yield, MT/Fd	Economic Price, LE/MT	Area, Feddans	Gross Revenue, LE 1000/Area	Input Costs, LE/Fd	Input Costs, LE 1000/Area	Labor Costs, LE/Fd	Labor Costs, LE 1000/Area	Net Revenue, LE 1000/Area
Summer:									
Peanuts	.53	387	1618	332	86	139	81	131	62
Maize	.45	132	1261	75	30	38	61	77	(40)
Cowpeas	1.2	50	419	25	40	17	46	19	(11)
Vegetables ^{a/}	3.0	59	83	15	105	9	125	10	(4)
Winter:									
Berseem	6.9	10	1334	92	29	39	59	79	(26)
Green Peas	1.08	134	1545	224	62	96	81	125	3
Vegetables ^{a/}	3.0	59	52	9	105	5	125	7	(3)
Wheat	.68	147	211	21	36	8	41	9	4
Lupins	.45	250	315	35	32	10	48	15	10
Total	-	-	6838	828	-	361	-	472	(5)

^{a/} Tomatoes used as representative vegetable crop.

ECONOMIC ANALYSIS OF SECONDARY GRADUATES FARMS, 1979

Table 1.26

5456 Feddans - Cropping Intensity 174.8%

<u>Crops</u>	<u>Yield, MT/Fd</u>	<u>Economic Price, LE/MT</u>	<u>Area, Feddans</u>	<u>Gross Revenue, LE 1000/Area</u>	<u>Input Costs, LE/Fd</u>	<u>Input Costs, LE 1000/Area</u>	<u>Labor Costs, LE/Fd</u>	<u>Labor Costs, LE 1000/Area</u>	<u>Net Revenue, LE 1000/Area</u>
Summer:									
Peanuts	.51	387	2984	589	86	257	63	188	144
Maize	.5	132	376	25	32	12	48	18	(5)
Vegetables ^{a/}	2.0	59	142	17	97	14	109	15	(12)
Sesame	.24	415	644	64	18	12	41	26	26
Watermelon	2.4	50	595	71	60	36	55	33	2
Winter:									
Berseem	5.8	10	1099	64	27	30	45	49	(15)
Green Peas	.84	134	1108	125	62	69	63	70	(14)
Vegetables ^{a/}	2.0	59	16	2	97	2	109	2	(2)
Lupins	.35	250	267	23	32	9	37	10	(4)
Barley	.43	125	1942	104	29	56	31	60	(12)
Permanent:									
Citrus	2.76	80	183	40	93	17	88	16	7
Total	-	-	9354	1124	-	514	-	487	115

^{a/} Tomatoes used as representative vegetable crop.

ECONOMIC ANALYSIS OF UNIVERSITY GRADUATES FARMS, 1979

Table 1.27

7622 Feddans - Cropping Intensity 142%

<u>Crops</u>	<u>Yield, MT/Fd</u>	<u>Economic Price, LE/MT</u>	<u>Area, Feddans</u>	<u>Gross Revenue, LE 1000/Area</u>	<u>Input Costs, LE/Fd</u>	<u>Input Costs, LE 1000/Area</u>	<u>Labor Costs, LE/Fd</u>	<u>Labor Costs, LE 1000/Area</u>	<u>Net Revenue, LE 1000/Area</u>
Summer:									
Peanuts	.51	387	3552	701	86	305	63	224	172
Maize	.5	132	320	21	32	10	48	15	(4)
Vegetables ^{a/}	2.0	59	76	9	97	7	109	8	(6)
Sesame	.24	415	313	31	18	6	41	13	12
Watermelons	2.4	50	564	68	60	34	55	31	3
Winter:									
Berseem	5.8	10	1201	70	27	32	45	54	(16)
Green Peas	.84	134	1238	139	62	77	63	78	(16)
Vegetables ^{a/}	2.0	59	114	13	97	11	109	12	(10)
Wheat	.45	147	61	4	36	2	31	2	0
Lupins	.35	250	617	54	32	20	37	23	11
Barley	.43	125	1105	59	29	32	31	34	(7)
Permanent:									
Citrus	2.76	80	833	184	93	77	88	73	34
Total	-	-	9994	1353	-	613	-	567	173

^{a/} Tomatoes used as representative vegetable crop.

Table 1.28

Farm Plan; Settlers, 5 Feddan, Year 1 (Financial Prices)200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
		% of Target						% of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	1.6	304	274	261	245	127	-0-	177	147	134	118
Maize	1.5	117	101	92	86	42	-0-	75	59	50	44
Fodder	1.0	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	36	-0-	(36) ^{b/}	(36) ^{b/}	(36) ^{b/}	(36) ^{b/}
Tomatoes ^{a/}	.25	72	64	60	56	24	-0-	48	40	36	32
Sesame	.25	49	43	40	37	4	-0-	45	39	36	33
Cowpeas	.4	26	24	24	24	13	-0-	13	11	11	11
Winter :											
Berseem	1.6	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	37	-0-	(37) ^{b/}	(37) ^{b/}	(37) ^{b/}	(37) ^{b/}
Wheat	.5	35	31	29	26	15	-0-	20	16	14	11
Barley	.3	17	14	14	12	8	-0-	9	6	6	4
Lupins	.5	74	68	64	60	13	-0-	61	55	51	47
Tomatoes ^{a/}	.25	72	64	60	56	24	-0-	48	40	36	32
Green Peas	1.85	325	297	283	268	89	-0-	236	208	194	179
Animal	1.0	305	265	245	225	136	-0-	169	129	109	89
Totals		1,396	1,245	1,172	1,095	568	-0-	828	677	604	527

^{a/} Tomatoes used as representative vegetable crop.

^{b/} Revenue transferred to Revenue for Animal.

Note: Cow purchase cost of LE 400 not included.

Table 1. 29

Farm Plan: Settlers, 5 Feddan, Year 5 (Financial Prices)200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	1.6	397	333	299	266	131	-0-	266	202	168	135
Maize	.9	114	94	83	73	31	-0-	83	63	52	42
Fodder	1.0	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	42	-0-	(42) ^{b/}	(42) ^{b/}	(42) ^{b/}	(42) ^{b/}
Tomatoes ^{a/}	.6	259	212	188	167	64	-0-	195	148	124	103
Sesame	.5	149	122	110	96	9	-0-	140	113	101	87
Cowpeas	.4	30	25	24	24	14	-0-	16	11	10	10
Winter :											
Berseem	1.6	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	42	-0-	(42) ^{b/}	(42) ^{b/}	(42) ^{b/}	(42) ^{b/}
Wheat	.5	51	42	38	33	17	-0-	34	25	21	16
Barley	.3	27	22	20	17	10	-0-	17	12	10	7
Lupins	.5	96	80	72	64	14	-0-	82	66	58	50
Tomatoes ^{a/}	.6	259	212	188	167	64	-0-	195	148	124	103
Green Peas	1.5	320	269	243	217	75	-0-	245	194	168	142
Animal	1	425	361	329	297	139	-0-	286	222	190	158
Totals		2,127	1,772	1,594	1,421	652	-0-	1,475	1,120	942	769

^{a/} Tomatoes used as representative vegetable crop.

^{b/} Net Revenue transferred to Net Revenue of Animal.

Note: Cow replacement cost of LE 287 over cull cow not included.

Table 1.30

Farm Plan: Settlers, 5 Feddan, Year 10 (Financial Prices)

200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	1.6	470	376	330	282	134	-0-	336	242	196	148
Maize	.9	148	118	103	89	35	-0-	113	83	68	54
Fodder	.8	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	37	-0-	(37) ^{b/}	(37) ^{b/}	(37) ^{b/}	(37) ^{b/}
Tomatoes ^{a/}	.8	425	340	298	255	90	-0-	335	250	208	165
Sesame	.5	187	149	131	112	10	-0-	177	139	121	102
Cowpeas	.4	32	26	24	24	14	-0-	18	12	10	10
Winter :											
Berseem	1.4	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	40	-0-	(40) ^{b/}	(40) ^{b/}	(40) ^{b/}	(40) ^{b/}
Wheat	.5	63	50	44	38	19	-0-	44	31	25	19
Barley	.3	35	27	25	21	11	-0-	24	16	14	10
Lupins	.5	112	90	78	68	15	-0-	97	95	63	53
Tomatoes ^{a/}	.8	425	340	298	255	90	-0-	335	250	208	165
Green Peas	1.5	362	289	253	217	78	-0-	284	211	175	139
Animal	1	495	417	378	339	90	-0-	405	327	288	249
Totals		2,754	2,222	1,962	1,700	663	-0-	2,091	1,559	1,299	1,037

^{a/} Tomatoes used as representative vegetable crop.

^{b/} Revenue transferred to Revenue of Animal.

Note: Cow replacement cost of LE 287 over cull cow not included.

Table 1.31

Farm Plan: Settlers, 5 Feddan, Year 1/ (Economic Prices)

200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as % of Target				Production Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	1.6	440	396	378	354	147	138	155	111	93	69
Maize	1.5	188	162 ^{b/}	148 ^{b/}	136 ^{b/}	64	92	32	6 ^{b/}	(8) ^{b/}	(20) ^{b/}
Fodder	1.0	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	59	50	(109) ^{b/}	(109) ^{b/}	(109) ^{b/}	(109) ^{b/}
Tomatoes ^{a/}	.25	72	64	60	56	30	31	11	3	(1)	(5)
Sesame	.25	49	43	40	37	6	13	30	24	21	18
Cowpeas	.4	26	24	24	24	20	18	(12)	(14)	(14)	(14)
Winter :											
Berseem	1.6	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	58	94	(152) ^{b/}	(152) ^{b/}	(152) ^{b/}	(152) ^{b/}
Green Peas	1.85	326	298	283	268	124	150	52	24	9	(6)
Lupins	.5	74	68	64	60	18	24	32	26	22	18
Tomatoes ^{a/}	.25	72	64	60	56	30	31	11	3	(1)	(5)
Wheat	.5	81	71	67	62	23	21	37	27	23	18
Barley	.3	32	27	26	24	12	12	8	3	2	0
Animal	1.0	264	224	204	184	62	101	101	61	41	21
Totals		1,624	1,441	1,354	1,261	653	775	196	13	(74)	(167)

a/ Tomatoes used as representative vegetable.

b/ Revenue transferred to revenue of Animal.

Note: Cow purchase cost of LE 400 not included.

Table 1.32

Farm Plan; Settlers, 5 Feddan, Year 3 (Economic Prices)200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as % of Target				Production Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	1.6	576	483	433	384	165	147	264	171	121	72
Maize	.9	184	151	133	116	58	55	71	38	20	3
Fodder	1.0	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	82	50	(132) ^{b/}	(132) ^{b/}	(132) ^{b/}	(132) ^{b/}
Tomatoes ^{a/}	.6	259	212	188	166	92	77	90	43	19	(3)
Sesame	.5	149	122	110	96	17	26	106	79	67	53
Cowpeas	.4	30	25	24	24	22	18	(10)	(15)	(16)	(16)
Winter :											
Berseem	1.6	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	79	94	(173) ^{b/}	(173) ^{b/}	(173) ^{b/}	(173) ^{b/}
Green Peas	1.5	320	270	243	218	117	122	81	31	4	(21)
Lupines	.5	96	80	72	64	22	24	50	34	26	18
Tomatoes ^{a/}	.6	259	212	188	166	92	77	90	43	19	(3)
Wheat	.5	118	98	87	77	33	21	64	44	33	23
Barley	.3	52	42	39	33	18	12	22	12	9	3
Animal	1.0	384	320	288	256	68	101	215	151	119	87
Totals		2,427	2,015	1,805	1,600	865	824	738	326	116	(89)

^{a/} Tomatoes used as representative vegetable crop.

^{b/} Revenue transferred to revenue of Animal.

Note: Cow purchase cost of LE 287 over cull cow not included.

Table 1.33

Farm Plan Settlers, 5 Feddan, Year 10. (Economic Prices)

200 Percent Cropping Intensity

Crop	Area, Feddans	Gross Revenue (LE) as % of Target				Production Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	1.6	681	545	477	408	176	155	350	214	146	77
Maize	.9	238	190	166	142	71	55	112	64	40	16
Fodder	.8	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	77	40	(117) ^{b/}	(117) ^{b/}	(117) ^{b/}	(117) ^{b/}
Tomatoes ^{a/}	.8	425	340	298	255	139	116	170	85	43	0
Sesame	.5	187	149	131	112	20	26	141	103	85	66
Cowpeas	.4	32	26	24	24	24	18	(10)	(16)	(18)	(18)
Winter:											
Berseem	1.4	0 ^{b/}	0 ^{b/}	0 ^{b/}	0 ^{b/}	80	83	(163) ^{b/}	(163) ^{b/}	(163) ^{b/}	(163) ^{b/}
Green Peas	1.5	362	290	252	218	126	134	102	30	(8)	(42)
Lupins	.5	112	90	78	68	23	24	65	43	31	21
Tomatoes ^{a/}	.8	425	340	298	255	139	116	170	85	43	0
Wheat	.5	147	118	103	88	40	20	87	58	43	28
Barley	.3	68	52	49	40	22	12	34	18	15	6
Animal	1	454	376	337	298	70	101	283	205	166	127
Totals		3,131	2,516	2,213	1,908	1,007	900	1,224	609	306	1

^{a/} Tomatoes used as representative vegetable crop.

^{b/} Revenue transferred to Revenue of Animal.

Note: Cow purchase cost of LE 287 over cull cow not included.

Table 1.34

Labor Requirements, Settlers Farm, Five Feddans
Year 1

Crops	Man-Days By Month												TOTAL	
	Fd.	J	F	M	Ap.	My	Ju	Jl	Au	S	O	N		D
Peanuts	1.6				18	20	20	20	6	34				118
Sesame	.25					3	3	1	5					12
Fodder	1.0				5	6	11	12	11					65
Maize	1.5				8	18	18	13	4	22				83
Cowpeas	.4					2	4	4	7					17
Tomatoes	.25		1	6	4	12	6							29
Berseem	1.6	10	10	8	6					7	6	15	14	76
Green Peas	1.85	46								13	33	33	11	136
Lupines	.5	1	10								3	7	1	22
Wheat	.5	2	1	11								2	2	9
Barley	.3	1	1	7								1	1	11
Tomatoes	.25	6								1	6	4	12	29
Animal, Hd	1	8	7	6	7	8	7	8	8	7	8	7	8	91
TOTAL		74	30	40	48	69	69	58	41	84	56	69	50	688

Table 1-35

Labor Requirements, Settlers Farm, Five Feddans
Year 10

Crops	Man - Days By Month													
	Fd.	J	F	M	Ap.	My	Ju	Jl	Au	S	O	N	D	TOTAL
Peanuts	1.6				18	20	20	20	6	34				118
Sesame	.5					7	6	1	9					23
Fodder	.8				4	5	9	9	9					36
Maize	.9				5	11	11	8	2	13				50
Cowpeas	.4					2	4	4	7					17
Tomatoes	.8		2	19	14	38	19							92
Berseem	1.4	8	8	13	8					6	6	13	13	75
Green Peas	1.5	38								10	27	27	9	111
Lupines	.5	1	10								3	7	1	22
Wheat	.5	2	1	1	10							3	2	19
Barley	.3	1	1	1	6							1	1	11
Tomatoes	.8	19								2	19	14	38	92
Animal	1	8	7	8	7	8	7	8	8	7	8	7	8	91
TOTAL		77	29	42	72	91	76	50	41	72	63	72	72	757

Table 1.36

Farm Plan: Graduated, 20 Feddans, Year 1 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target					
		125	100	87.5	75			125	100	87.5	75		
Permanent:													
Citrus	10	0	0	0	0	253	76	(329)	(329)	(329)	(329)		
Summer:													
Peanuts	9.3 ^{a/}	1665	1488	1414	1339	735	623	307	130	56	(19)		
Maize	1.3	104	91	84	77	31	62	11	(2)	(9)	(16)		
Fodder	4.0 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	140	164	(304) ^{c/}	(304) ^{c/}	(304) ^{c/}	(304) ^{c/}		
Tomatoes ^{b/}	1.4	273	239	222	207	128	153	(8)	(42)	(59)	(74)		
Sesame	1.0	174	154	141	122	15	41	118	98	85	66		
Watermelon	1.0	300	255	230	211	62	55	183	138	113	94		
Winter:													
Berseem	6.3 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	142	284	(426) ^{c/}	(426) ^{c/}	(426) ^{c/}	(426) ^{c/}		
Wheat	2.0	114	102	94	86	55	62	(3)	(15)	(23)	(31)		
Barley	1.3	74	62	60	53	34	40	0	(12)	(14)	(21)		
Lupins	2.4	276	252	233	218	62	89	125	101	82	67		
Tomatoes ^{b/}	1.0	195	171	159	148	91	109	(5)	(29)	(41)	(52)		
Green Peas	5.0 ^a	705	645	610	575	230	315	160	100	65	30		
Animals, Hd	3	915	795	735	675	408	301	206	86	26	(3)		
Total		4795	4254	3982	3711	2386	2374	35	(506)	(778)	(1045)		

^{a/} Area shown at target yields. At higher or lower yields fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.37

Farm Plan: Graduates, 20 Feddans, Year 5 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) % of Target					
		125	100	87.5	75			125	100	87.5	75		
Permanent:													
Citrus	10	800	640	560	480	563	545	(308)	(468)	(548)	(628)		
Summer:													
Peanuts	7.4 ^{a/}	1702	1421	1265	1132	599	533	570	289	133	0		
Maize	1.3	167	136	122	107	44	62	61	30	16	1		
Fodder	2.9 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	119	119	(238) ^{c/}	(238) ^{c/}	(238) ^{c/}	(238) ^{c/}		
Tomatoes ^{b/}	1.4	396	330	297	259	136	153	107	41	8	(30)		
Sesame	1.0	266	216	195	171	18	41	207	157	136	112		
Watermelon	1.0	515	420	370	322	76	56	383	288	238	190		
Winter:													
Berseem	5.0 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	126	225	(351) ^{c/}	(351) ^{c/}	(351) ^{c/}	(351) ^{c/}		
Wheat	2.0	196	158	138	124	68	62	66	28	8	(6)		
Barley	1.3	118	95	89	75	41	40	37	14	8	(6)		
Lupins	2.4	360	300	264	240	65	65	230	170	134	110		
Tomatoes ^{b/}	1.0	283	236	212	185	97	109	77	30	6	(21)		
Green Peas	3.3 ^{a/}	581	485	439	399	165	208	208	112	66	26		
Animals	3	1275	1083	987	891	416	301	558	366	270	174		
Total		6659	5520	4938	4385	2533	2519	1607	468	(114)	(667)		

^{a/} Area shown at target yields. At higher or lower yields fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.38

Farm Plan: Graduates, 20 Feddans, Year 10 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target				
		125	100	87.5	75			125	100	87.5	75	
Permanent:												
Citrus	10	6400	5120	4480	3840	710	1260	4430	3150	2510	1870	
Summer:												
Peanuts	3.3 ^{a/}	881	706	617	528	271	248	362	187	98	9	
Maize	.6 ^{a/}	98	79	69	59	23	29	46	27	17	7	
Fodder	2.7 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	124	111	(235) ^{c/}	(235) ^{c/}	(235) ^{c/}	(235) ^{c/}	
Tomatoes ^{b/}	1.4	496	396	347	297	143	162	191	91	42	(8)	
Sesame	1.0	332	266	232	199	19	41	272	206	172	139	
Watermelon	1.0	675	540	470	405	87	60	528	393	323	258	
Winter:												
Berseem	5.4 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	147	243	(390) ^{c/}	(390) ^{c/}	(390) ^{c/}	(390) ^{c/}	
Wheat	.7 ^{a/}	88	71	62	53	27	22	39	22	13	4	
Lupins	1.5	263	210	183	158	42	56	165	112	85	60	
Tomatoes ^{b/}	1.0	354	283	248	212	102	116	136	65	30	(6)	
Green Peas	1.4 ^{a/}	281	225	197	169	70	88	123	67	39	11	
Animals	3	1485	1251	1134	1017	269	301	915	681	564	447	
Total		11353	9147	8039	6937	2034	2737	6582	4376	3268	216	

^{a/} Area shown at target yields. At higher or lower yields fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts, maize, wheat, and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.39

Farm Plan: Graduates, 20 Feddans, Year 1 (Economic Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target					
		125	100	87.5	75			125	100	87.5	75		
Permanent:													
Citrus	10	0	0	0	0	216	76	(292)	(292)	(292)	(292)		
Summer:													
Peanuts	9.3 ^{a/}	2409	2158	2055	1944	856	623	930	679	576	465		
Maize	1.3	168	146	136	124	56	62	50	28	18	6		
Fodder	4.0 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	224	164	(388) ^{c/}	(388) ^{c/}	(388) ^{c/}	(388) ^{c/}		
Tomatoes ^{b/}	1.4	273	239	223	207	153	153	(33)	(67)	(83)	(99)		
Sesame	1.0	174	154	141	133	23	41	110	90	77	69		
Watermelon	1.0	300	255	230	211	90	55	155	110	85	66		
Winter:													
Berseem	6.3 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	214	284	(498) ^{c/}	(498) ^{c/}	(498) ^{c/}	(498) ^{c/}		
Wheat	2.0	276	238	221	202	93	62	121	83	66	47		
Barley	1.3	141	120	115	104	51	40	50	29	24	13		
Lupins	2.4	276	252	233	223	84	89	103	79	60	50		
Tomatoes ^{b/}	1.0	195	171	159	148	109	109	(23)	(47)	(59)	(70)		
Green Peas	5.0 ^{a/}	705	645	610	575	335	315	55	(5)	(40)	(75)		
Animals	3	792	672	612	552	186	301	305	185	125	6		
Totals		5709	5050	4735	4423	2690	2374	645	(14)	(328)	(64)		

^{a/} Area shown at target yields. At higher or lower yields fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.40

Farm Plan: Graduates, 20 Feddans, Year 5 (Economic Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target					
		125	100	87.5	75			125	100	87.5	75		
Permanent:													
Citrus	10	800	640	560	480	753	545	(498)	(658)	(738)	(818)		
Summer:													
Peanuts	7.4 ^{a/}	1702	1421	1265	1132	599	533	570	289	133	0		
Maize	1.3	269	220	196	172	85	62	122	73	49	25		
Fodder	2.9 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	232	119	(351) ^{c/}	(351) ^{c/}	(351) ^{c/}	(351) ^{c/}		
Tomatoes ^{b/}	1.4	396	330	297	256	181	153	62	(4)	(37)	(78)		
Sesame	1.0	266	216	195	170	31	41	194	144	123	98		
Watermelon	1.0	515	420	370	322	143	56	316	221	171	123		
Winter:													
Berseem	5.0 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	230	225	(455) ^{c/}	(455) ^{c/}	(455) ^{c/}	(455) ^{c/}		
Wheat	2.0	441	382	323	288	132	62	247	188	129	94		
Barley	1.3	228	182	171	148	77	40	111	65	54	31		
Lupins	2.4	372	312	269	240	103	89	180	120	77	48		
Tomatoes ^{b/}	1.0	283	236	212	183	129	109	45	(2)	(26)	(55)		
Green Peas	3.3 ^{a/}	581	485	436	389	257	208	116	20	(29)	(76)		
Animals	3	1151	959	863	768	204	301	646	454	358	263		
Total		7004	5803	5157	4548	3156	2543	1305	104	(542)	(1151)		

^{a/} Area shown at target yields. At higher or lower yield fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.41

Farm Plan Graduates 20 Feddans Year 10 (Economic Prices)

200 Percent Cropping Intensity

Crops	Area Feddans	Gross Revenue (LE) as % of Target				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as % of Target				
		125	100	87.5	75			125	100	87.5	75	
Permanent:												
Citrus	10	6400	5120	4480	3840	1306	1260	3834	2554	1914	1274	
Summer:												
Peanuts	3.3 ^{a/}	1277	1023	894	766	363	248	666	412	283	155	
Maize	.6 ^{a/}	158	127	111	95	47	29	82	51	35	19	
Fodder	2.7 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	259	110	(369) ^{c/}	(369) ^{c/}	(369) ^{c/}	(369) ^{c/}	
Tomatoes ^{b/}	1.4	495	396	347	297	200	164	131	32	(17)	(67)	
Sesame	1.0	332	265	232	199	37	41	254	187	154	121	
Watermelon	1.0	675	540	470	405	179	60	436	301	231	166	
Winter:												
Berseem	5.4 ^{a/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	0 ^{c/}	286	243	(529) ^{c/}	(529) ^{c/}	(529) ^{c/}	(529) ^{c/}	
Wheat	.7 ^{a/}	206	165	144	123	55	22	129	88	67	46	
Lupins	1.5	262	210	183	157	69	55	138	86	59	33	
Tomatoes ^{b/}	1.0	354	283	248	212	143	117	94	23	(12)	(48)	
Green Peas	1.4	281	225	196	169	118	88	75	19	(10)	(37)	
Animals	3	1362	1128	1011	894	210	301	851	617	500	383	
Totals		11802	9482	8316	7157	3272	2738	5792	3472	2306	1147	

^{a/} Area shown at target yields. At higher or lower yields fodder and berseem area and production input costs decrease or increase at the advantage or disadvantage of peanuts, maize, wheat and green peas sufficiently to maintain 3 animals.

^{b/} Tomatoes used as representative vegetable crop.

^{c/} Revenue transferred to revenue of animals.

Table 1.42

Labor Requirements, Graduate Farm, Twenty Feddans
Year 1

Crops	Man-Days By Month													
	Fd.	J	F	M	Ap.	My	Ju	JI	Au	S	O	N	D	TOTAL
Peanuts	9.3				107	114	112	42	23	168				566
Maize	1.3				5	20	11	4	3	14				57
Fodder	4.0				10	20	52	48	41					171
Tomatoes	1.4		2	32	27	27	34	17						139
Sesame	1.0					9	9	3	16					37
Watermelon	1.0			12	12	1	3	12						50
Berseem	6.3	50	13	54	50					22	17	2	49	257
Wheat	2.0	5	3	4	4	26						6	8	56
Barley	1.3	3	2	3	3	17						4	5	37
Lupine	2.4	5	37								10	26	3	81
Tomatoes	1.0	24	12							2	23	19	19	99
Green Peas	5.0	118								20	68	70	10	286
Citrus	10	3	3	3	18	3	18	4		3	4	3	3	69
Animals	3	23	21	23	23	23	23	23	23	23	23	23	23	274
TOTAL		231	93	131	259	270	262	153	110	252	145	153	120	2179

Table 1.43

Labor Requirements, Graduate Farm, Twenty Faddana
Year 10

Crops	Man-Days By Month													
	Fd.	J	F	M	Ap.	My	Ju	Jl	Au	S	O	N	D	TOTAL
Peanuts	3.3				33	36	35	13	7	100				224
Maize	.6				2	7	5	2	10					26
Fodder	2.7				7	13	30	27	23					100
Tomatoes	1.4		2	32	27	26	38	23						148
Sesame	1.0					9	9	3	16					37
Watermelon	1.0			13	11	11	3	17						55
Berseem	5.4	43	11	46	43						19	16	43	221
Wheat	.7	2	1	1	1	9						2	3	19
Barley	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Lupines	1.5	3	23								6	14	5	51
Tomatoes	1.0	25	16							2	23	20	19	1105
Greenpeas	1.4	30								6	20	21	3	80
Citrus	10	150	160	130	15	30	45	40	45	20	140	170	200	1145
Animal	3	23	21	23	23	23	23	23	23	23	23	23	23	274
Total		276	234	245	162	164	188	148	124	151	231	266	296	2485

Table 1.44

Farm Plan: Graduates, 20 Feddan Farm, No Citrus, Year 1 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
		% of Target						% of Target			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	6.4	1146	1024	973	922	503	428	215	93	42	(9)
Maize	6.0	482	418	389	354	141	288	53	(11)	(40)	(75)
Fodder	4.0	0	0	0	0	138	164	(302)	(302)	(302)	(302)
Tomatoes	1.0	195	171	159	148	91	109	(5)	(29)	(41)	(52)
Sesame	1.0	174	154	141	122	16	41	117	97	84	65
Cowpeas	1.6	88	83	80	80	50	56	(18)	(23)	(26)	(26)
Winter:											
Berseem	6.4	0	0	0	0	145	288	(433)	(433)	(433)	(433)
Wheat	2.0	113	102	95	86	55	62	(4)	(15)	(22)	(31)
Barley	1.2	68	58	55	50	32	37	(1)	(11)	(14)	(19)
Lupins	2.0	230	210	194	182	52	74	104	84	68	56
Tomatoes	1.0	195	171	159	148	91	109	(5)	(29)	(41)	(52)
Green Peas	7.4	1041	952	902	851	343	466	232	143	93	42
Animals, Hd	4	1220	1060	980	900	544	404	272	112	32	(48)
Totals		4952	4403	4127	3843	2201	2526	225	(324)	(600)	(884)

Table 1.45

Farm Plan: Graduates, 20 Feddan Farm, No Citrus, Year 5 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as				Pro- duction Input Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	6.4	1472	1229	1094	979	517	458	497	254	119	4
Maize	3.6	463	378	337	295	123	173	167	82	41	(1)
Fodder	4.0	0	0	0	0	164	164	(328)	(328)	(328)	(328)
Tomatoes	2.4	679	566	509	444	234	262	183	70	13	(52)
Sesame	2.0	531	432	390	342	35	82	414	315	273	225
Cowpeas	1.6	102	86	80	80	52	56	(6)	(22)	(28)	(28)
Winter:											
Berseem	6.4	0	0	0	0	161	288	(449)	(449)	(449)	(449)
Wheat	2.0	195	159	142	124	68	62	65	29	12	(6)
Barley	1.2	109	87	82	70	38	37	34	12	7	(5)
Lupins	2.0	300	250	220	200	54	74	172	122	92	72
Tomatoes	2.4	679	566	509	444	234	262	183	70	13	(52)
Green Peas	6.0	1053	884	796	708	289	378	386	217	129	41
Animals, Hd	4	1700	1444	1316	1188	554	404	742	486	358	230
Total	-	7283	6081	5475	4874	2523	2700	2060	858	252	(349)

Table 1.46

Farm Plan, Graduates, 20 Feddan Farm, No Citrus, Year 10 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE) as				Pro- duction Unit Costs (LE)	Labor Costs (LE)	Net Revenue (LE) as			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	6.4	1709	1370	1197	1024	527	480	702	363	190	17
Maize	3.6	590	472	413	354	139	173	278	160	101	42
Fodder	3.2	0	0	0	0	147	131	(278)	(278)	(278)	(278)
Tomatoes	3.2	1133	906	794	678	325	373	435	208	96	(20)
Sesame	2.0	664	531	465	398	39	82	543	410	344	277
Cowpeas	1.6	116	90	80	80	53	56	3	(19)	(29)	(29)
Winter:											
Beraeem	5.6	0	0	0	0	152	252	(404)	(404)	(404)	(404)
Wheat	2.0	252	202	176	151	77	62	113	63	37	12
Barley	1.2	140	109	101	84	43	37	60	29	21	4
Lupins	2.0	350	280	244	210	56	74	220	150	114	80
Tomatoes	3.2	1133	906	794	678	325	373	435	208	96	(20)
Green Peas	6.0	1206	965	844	724	297	378	531	290	169	49
Animals, Hd	4	1980	1668	1512	1356	359	404	1217	905	749	593
Total		9269	7499	6620	5737	2539	2875	3855	2085	1206	323

Table 1.47

Farm Plan - Joint Venture 6000 Feddans - Year 1 (Financial Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000) as % of Target				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	2000	534	428	374	320	197	24	313	207	153	99
Maize	80	12	9	8	7	4	1	7	4	3	2
Fodder	1920	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	108	23	(131) ^{a/}	(131) ^{a/}	(131) ^{a/}	(131) ^{a/}
Tomatoes	200	130	104	91	78	64	4	62	36	23	10
Potatoes	900	648	518	454	389	250	12	386	256	192	127
Onions	900	432	346	302	259	179	14	239	153	109	66
Winter:											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	111	24	(135) ^{a/}	(135) ^{a/}	(135) ^{a/}	(135) ^{a/}
Tomatoes	200	130	104	91	78	64	4	62	36	23	10
Potatoes	900	648	518	454	389	250	12	386	256	192	127
Onions	900	432	346	302	259	179	14	239	153	109	66
Barley	2000	117	94	82	70	70	22	25	2	(10)	(22)
Animals, hd. ^{b/}	4800	1260	1008	882	756	528	24	570	456	399	347
Total		4343	3475	3040	2605	2004	178	2023	1293	927	561

a/ Revenue transferred to revenue for animals.

b/ Production input and labor costs should be multiplied by their respective percentages to calculate their respective net revenues.

Table 1, 48

Farm Plan - Joint Venture 6000 Feddans - Year 3 (Financial Prices)
200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000) as % of Target				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	2000	668	534	467	400	203	24	441	307	240	173
Maize	440	92	74	65	55	24	5	63	45	36	26
Fodder	1560	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	98	19	(117) ^{a/}	(117) ^{a/}	(117) ^{a/}	(117) ^{a/}
Tomatoes	200	137	110	95	82	65	3	69	42	27	14
Potatoes	900	648	518	454	389	250	12	386	256	192	127
Onions	900	637	509	446	382	189	14	434	306	243	179
Winter:											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	115	24	(139) ^{a/}	(139) ^{a/}	(139) ^{a/}	(139) ^{a/}
Tomatoes	200	137	110	95	82	65	3	69	42	27	14
Potatoes	900	648	518	454	389	250	12	386	256	192	127
Onions	900	636	509	446	382	189	14	433	306	243	179
Barley	2000	227	182	159	136	86	22	119	74	51	28
Animals, hd ^{b/}	5440	1433	1142	999	853	598	31	646	513	449	380
Totals		5257	4206	3680	3154	2132	183	2789	1891	1444	991

^{a/} Revenue transferred to revenue for animals.

^{b/} Production input and labor costs should be multiplied by their respective percentages to calculate their respective net revenue.

Table 1.49

Farm Plan - Joint Venture 6000 Feddans - Year 6 (Financial Prices)
200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000) as % of Target				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	2000	748	598	524	448	206	24	518	368	294	218
Maize	560	138	110	96	83	34	6	98	70	56	43
Fodder	1440	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	95	17	(112) ^{a/}	(112) ^{a/}	(112) ^{a/}	(112) ^{a/}
Tomatoes	200	141	113	99	85	65	4	72	44	30	16
Potatoes	900	640	512	448	384	250	12	378	250	186	122
Onions	900	756	605	529	454	193	14	549	398	322	247
Winter:											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	118	24	(142) ^{a/}	(142) ^{a/}	(142) ^{a/}	(142) ^{a/}
Tomatoes	200	142	113	99	85	65	4	73	44	30	16
Potatoes	900	640	512	448	384	250	12	378	250	186	122
Onions	900	756	605	529	454	193	14	549	398	322	247
Barley	2000	292	234	205	175	96	22	172	116	87	57
Animals, Hd ^{b/}	5760	<u>1512</u>	<u>1210</u>	<u>1059</u>	<u>907</u>	<u>625</u>	<u>34</u>	<u>692</u>	<u>551</u>	<u>482</u>	<u>413</u>
Total		5765	4612	4236	3459	2190	187	3225	2235	1741	1247

a/ Revenue transferred to revenue for animals.

b/ Production input and labor costs should be multiplied by their respective percentages to calculate their net revenues.

Table 1.50

Farm Plan - Joint Venture 6000 Feddans - Year 1 (Economic Prices)
200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000) as % of Target				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	2000	774	619	542	464	248	24	502	347	270	192
Maize	80	19	15	13	11	6	1	12	8	6	4
Fodder	1920	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	171	23	(194)	(194)	(194)	(194)
Tomatoes	200	130	104	91	78	84	4	42	16	3	(10)
Potatoes	900	648	518	454	389	275	12	361	231	167	102
Onions	900	432	346	302	259	243	14	175	89	45	2
Winter:											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	176	24	(200)	(200)	(200)	(200)
Tomatoes	200	130	104	91	78	84	4	42	16	3	(10)
Potatoes	900	648	518	454	389	275	12	361	231	167	102
Onions	900	432	346	302	259	243	14	175	89	45	2
Barley	2000	225	180	158	135	106	22	97	52	30	7
Animals, Hd ^{b/}	4800	765	612	536	459	328	24	325	260	228	195
Totals		4203	3362	2943	2521	2239	178	1698	945	570	192

a/ Revenue transferred to revenue for animals.

b/ Production input and labor costs should be multiplied by their respective percentages to calculate their respective net revenue.

Table 1.51

Farm Plan - Joint Venture 6000 Feddans - Year 3 (Economic Prices)

200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000)				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000)			
		125	100	87.5	75			125	100	87.5	75
Summer:											
Peanuts	2000	968	774	677	580	269	24	675	481	384	287
Maize	440	151	121	106	91	44	6	102	71	57	41
Fodder	1560	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	170	19	(189) ^{a/}	(189) ^{a/}	(189) ^{a/}	(189) ^{a/}
Tomatoes	200	137	110	95	82	87	4	46	19	4	(9)
Potatoes	900	648	518	454	389	290	12	346	216	152	87
Onions	900	635	508	444	381	272	14	349	222	158	95
Winter:											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	202	24	(226) ^{a/}	(226) ^{a/}	(226) ^{a/}	(226) ^{a/}
Tomatoes	200	137	110	95	82	87	4	46	19	4	(9)
Potatoes	900	648	518	454	389	290	12	346	216	152	87
Onions	900	635	508	444	381	272	14	349	222	158	95
Barley	2000	437	350	306	262	152	22	263	176	127	88
Animals, Hd ^{b/}	5440	868	694	607	521	364	31	374	299	262	224
Total		5264	4211	3682	3158	2499	186	2481	1526	1043	571

a/ Revenue transferred to revenue for animals.

b/ Production input and labor costs should be multiplied by their respective percentages to calculate their respective net revenues.

Farm Plan - Joint Venture 6000 Feddans - Year 6 (Economic Prices)
200 Percent Cropping Intensity

Crops	Area, Feddans	Gross Revenue (LE 1000) as % of Target				Pro- duction Input Costs (LE 1000)	Labor Costs (LE 1000)	Net Revenue (LE 1000) as % of Target			
		125	100	87.5	75			125	100	87.5	75
Summer :											
Peanuts	2000	1084	867	759	650	289	24	771	554	446	337
Maize	560	219	175	153	131	70	7	142	98	76	54
Fodder	1440	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	182	17	(199) ^{a/}	(199) ^{a/}	(199) ^{a/}	(199) ^{a/}
Tomatoes	200	141	113	99	85	91	4	46	18	4	(10)
Potatoes	900	648	518	453	389	307	12	329	199	134	70
Onions	900	756	605	529	454	297	14	445	294	218	143
Winter :											
Berseem	2000	0 ^{a/}	0 ^{a/}	0 ^{a/}	0 ^{a/}	218	24	(242) ^{a/}	(242) ^{a/}	(242) ^{a/}	(242) ^{a/}
Tomatoes	200	141	113	99	85	91	4	46	18	4	(10)
Potatoes	900	648	518	453	389	307	12	329	199	134	70
Onions	900	756	605	529	454	297	14	445	294	218	143
Barley	2000	565	452	396	339	192	22	351	238	182	125
Animals, Hd ^{b/}	5760	917	734	642	550	383	34	396	317	277	238
Total		5875	4700	4112	3525	2724	188	2859	1788	1252	719

a/ Revenue transferred to revenue for animals.

b/ Production inputs and labor costs should be multiplied by their respective percentages to calculate their respective net revenues.

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO.2
SOCIOLOGICAL CONSIDERATIONS

TAHADDI: A Case Study
of a Land Reclamation Project in Egypt

JANUARY 1980

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Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO.2
SOCIOLOGICAL CONSIDERATIONS
TAHADDI: A CASE STUDY

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EGYPT NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

WORKING PAPER NO.2

SOCIOLOGICAL CONSIDERATIONS

Introduction

2.1 In the last year and one half Egypt has witnessed an increasing interest among government officials and the general public on the topic of expansion in the New Lands,^{1/} mostly in desert regions. The Egyptian newspapers reflect this interest by printing daily articles about future land reclamation projects. In spite of the fact that land reclamation seems to be one of the major concerns of the Egyptian government, very little is known about the sociological dynamics of land reclamation. The available sociological literature on land reclamation projects is sparse, and much of it represents the norms for setting up communities in the New Lands. It is beyond the scope of this feasibility study to attempt any major in-depth survey of all land reclamation projects in Egypt. There is, however, a tremendous need for such a study that will focus on all the dimensions of the human component in the New Lands of Egypt.

2.2 In Egypt, the term "land reclamation" means different things to different people. To the government of Egypt, land reclamation projects have positive social, economic, and political implications. Through land reclamation projects, the government hopes to find partial solutions to the overcrowded villages of the Old Lands, and to the ever-increasing need for agricultural products. Politically the "green revolution" slogan captures the imagination of Egyptians who would like to expand the area of available land. To the Ministry of Land Reclamation, the term generally refers to the technical process of bringing various kinds of soils to a level of agricultural marginality. To the beneficiaries of the New Lands, peasants, agricultural university graduates^{2/} and government officials, land reclamation has different meanings.

1/ "New Lands" in Egypt are reclaimed lands. The opposite term is "Old Lands" and refers to agricultural areas that are under gravity command of the Nile, and have silt soils.

2/ The term "graduate" refers to (1) agricultural university graduates who have the option of owning 30 feddans in the New Lands, and (2) agricultural secondary school graduates who have the option of owning 20 feddans in the New Lands.

To a landless peasant who hopes to be granted land, reclamation means "an opportunity to own land", "a new and better life", "a door to a life of dignity as a land-owner", and "a chance to have a decent life for my family"; these are quotations from settlers in the New Lands. To an agricultural university graduate who has spent a few years working for the government, then decides to become a farmer on 30 feddans in the New Lands, land reclamation means "an escape from routine", a "hope for a better economic condition", and a "chance to leave something behind for the children". To government administrators who are assigned to positions in the New Lands, land reclamation means "misery for our families who have to suffer from the poor quality of the infrastructure services", poor salaries, and more expensive prices for all goods", and the "end of enjoying the little niceties of life". These statements were selected from interviews with beneficiaries of New Land projects.

Settlement Models in the New Lands of Egypt

2.3 One can perceive several models for settlements in Egypt's New Lands: (a) a model that provides optimum settlement, or (b) a low labor-intensity model that has minimum settlement requirements. The first model we will refer to here is the settlers' model where the labor requirements for cultivating 30,000 feddans (five feddans for each family) is anticipated to be about 49,026 ^{1/} settlers' families and support staff. In the second, a joint venture model, farming 30,000 feddans will require 1260 people, farm laborers and technicians.

Social Benefits of High Density Settlement Models:

- (a) It offers job opportunities to a large number of people;
- (b) It relieves the population pressures of the Old Lands;
- (c) It offers a large number of landless Egyptian farmers the opportunity to own land;
- (d) It offers a large number of settlers' children the opportunity to have a better standard of living, because of the availability of social services in the New Lands.

^{1/} This figure was obtained using the family size of six persons for settlers and five for support staff.

2.4 The studies in the New Lands show that after three years of settlement and owning land, settlers enjoyed a high standard of living. In South Tahrir and Abis, old settlements in reclaimed lands, settlers send their children to school, enjoy a high level of awareness of the value of education, and have a better sense of community organization. Settlers' wives participate in community development classes, learn new skills such as sewing, crocheting, etc. They become active in the political life of the community. It seems apparent that the settlers' model is the best of all the models in terms of being a successful social investment. Settlers, especially the landless type, tend to be highly motivated by the idea of owning land and owning a new red-brick house. They need to have a high degree of farming skills, hence their yields are higher than other groups and organizations, e.g. graduates and state farms.

2.5 If one of Egypt's main objectives is to create job opportunities for a large population that consists basically of peasants, it makes sense that one makes use of their agricultural knowledge by offering them land where they can make a decent living and add to the general overall economic production of the whole country.

The Low Labor Intensity (Joint Venture Model)

2.6 A 30,000 feddan joint venture, a collaborative agricultural investment by the GOE and a foreign investor, provides expected employment to 252 people. The joint venture model does not offer much relief from unemployment problems, or crowded conditions in Old Land villages. The viability of the joint venture is mainly economic, and to a lesser degree, social. The high yields will reflect on the general economy of the country. Socially, fewer people are employed on a joint venture project, and many of these leave their families behind because of the limited nature of social infrastructure on these projects.

Conceptual Framework

2.7 Theoretically, one can perceive two different ways of studying the communities of the New Lands in Egypt. At one level, one can study the macro-organizational and managerial structure that will involve decisions made by the various Ministries, such as the Ministry of Land Reclamation, Ministry of Education, Ministry of Irrigation, Ministry of Health, Ministry of Local Government and possibly the Ministry of Social Affairs^{1/} regarding infra-

^{1/} In the New Lands, the Ministry of Social Affairs supervises Sinai Desert and Suez Canal immigrants.

structure services. On another level, one can study the way in which individual beneficiaries adjust to life in the New Lands, and how they express their problems and their hopes. This study will focus primarily on the latter, the micro-level individuals interacting with their new environments. The two main components of the analysis are social and economic related issues.

(a) Economic Issues

- (i) Crop rotation and farm yields
- (ii) Labor requirements and wages
- (iii) Farm income on the New Lands
- (iv) Non-farm income

(b) Social Issues

- (i) The nature of the beneficiary
- (ii) Settlement impact on beneficiaries
- (iii) Role of women
- (iv) Beneficiary selection criteria
- (v) Parameters for social infrastructure services

These two components will be discussed within the cultural and the environmental context of the Tahaddi settlement.

Research Objectives

2.8 (a) Describe and analyze sociological issues pertinent to conditions essential for successful settlements in the New Lands of Egypt, e.g. demographic features, the nature of beneficiaries (income levels, ethnic backgrounds, new roles for women), attitudes and rationale for moving to the New Lands, socio-economic expectations of the different beneficiary groups, drop-out rates (why?), beneficiary-authority relationships, sources of conflict in New Land communities, sociological impact of settlement on social groups and individuals, and the quality of infrastructure services in the New Lands.

(b) Describe the existing norms and cultural constraints for the provision of all infrastructure services, and evaluate their competency level.

2.5

- (c) Establish a set of clearly defined sociological parameters for the construction of infrastructure services in settlements of the New Lands in Egypt.
- (d) Design three models for the construction of minimum social/commercial infrastructure packages needed for three different types of production units for settlers, graduates, and joint ventures.

Research Sites

- 2.9 (a) Tahaddi has been selected as a basic research site. Tahaddi is a relatively new settlement area (settled in 1967) that still suffers from inadequate infrastructure services. The problems of Tahaddi are not unique. They are found in all new settlements. These problems tend to be a function of mismanagement, lack of coordinated planning, lack of spare parts for machinery, small operative budgets, and major problems in the areas of the distribution of irrigation water.
- (b) For comparative purposes, areas other than Tahaddi were visited. Data has been collected from the South Tahrir farm laborers' camp, the Pepsi Cola joint venture farm, Abis and Al-Nahda, older settlements.
 - (c) Visits to settlers' home villages proved valuable. In order to assess the changes that a settler has to go through when he or she decides to join a settlement in the reclaimed lands of Egypt, one has to compare life in the New Lands with life previous to resettlement.

Research Methodology

2.10 A multimethod approach has been utilized in collecting the sociological data for this feasibility study:

- (a) A questionnaire was administered to 308 settlers, graduates, seasonal migrant farm laborers, and government employees.

Questionnaire Respondents

<u>No. of Persons</u>	<u>Group</u>	<u>Name in Arabic</u>
150	Settlers	<u>Muntafiin</u>
64	Graduates	<u>Xaregin</u> (19 secondary and 35 university)
44	Seasonal farm laborers	<u>Umal Tarahil</u>
50	Government employees	<u>Muwazafin</u>

- (b) Interviews were conducted with community leaders of the different ethnic groups, senior government employees, traders, barbers, mechanics, medicine men, etc. Team members were encouraged to use the "free flow of communication" method whenever possible.
- (c) Data was collected for case studies. A settler's wife, a graduate's wife, a female government employee, and a prominent community leader were chosen for study.
- (d) Other sources of data included a large volume of published materials on land reclamation both in Arabic and English. (Bibliography).
- (e) Discussions were held with local and international experts on settlements in Egypt's New Lands.

2.11 The objectives of the research were fully explained to all respondents prior to data collection. Research was conducted in Egyptian colloquial Arabic, the natives' spoken language.

2.12 Two months were spent in the field gaining insights into the sociology of settlements. The research team commuted daily to Tahaddi and other areas listed above collecting the necessary data. A two-week preliminary investigation that included interviews with various community members helped the team in designing the questionnaire.

Sampling Techniques

2.13 Four questionnaires were administered to a random sample of the population. The following variables were taken into consideration:

- (a) Samples were drawn from all villages of settlers
- (b) Samples were drawn from old settlers who have worked on the lands as tenants for three years and have been approved by the government to own the land in Village Three at Al Ma'araka
- (c) Samples were taken from the following three groups of people:
 - (i) Those who pay rent of LE3 per feddan (poor land)
 - (ii) Those who pay rent of LE9 per feddan
 - (iii) Those who pay rent of LE15 per feddan

Productivity in three types of land varies considerably. The LE3 feddans represent the poorest quality land. This is defined in terms of accessibility to water, period of reclamation, and the nature of the topography (levelling).
- (d) Samples were drawn from different ethnic groups, Upper Egyptians, Munifyians^{1/}, and Copts
- (e) Samples were drawn from university graduates and secondary school graduates
- (f) Samples were drawn from top, middle and low management levels
- (g) Wherever possible husbands and wives were interviewed separately to cross-check information
- (h) Income data was sometimes cross-checked with the Agricultural Co-op and neighbors

^{1/} From the Governorate of Munifiya, Lower Egypt.

Research Team

2.14 A team of four sociologists/anthropologists were involved in this study:

Dr Soheir Sukkary (Ph.D., Rural Development Consultant).

Mrs Sanaa Basiouny (M.A. in Rural Sociology, Cornell University, employed by MLR).

Mrs Hudda Abdel Moniem (B.E., Social Work, employed by MLR).

Mr Kamel Abu El Kheir (B.A., Social Work, Tahaddi Social Worker).

2.15 Dr Sukkary worked closely with the MLR staff to ensure that official political concerns of the Egyptian Government were heard and incorporated in the research design of the feasibility study. Dr Anwar Al Abd, Mr Abdel Wahab Abu El Kheir, Dr Anwar Al-Tawil, Mrs Zakiya Kufit and Mr Fahmy Al-Gayeh all made valuable contributions to the social section of this feasibility study.

Tahaddi

2.16 Tahaddi consists of 37,078 feddans of sprinkler irrigated sandy soil. Water for irrigation is drawn from the Nubariya Canal, a branch canal of the Nile, as well as groundwater.

A Brief History of Tahaddi

2.17 Historical Data: In 1959, Italconsult, an Italian company, started working on reclaiming 37,078 feddans that lie 140 km northwest of Cairo. The Arabic word "Tahaddi" means "Challenge" and is pronounced in Egyptian colloquial Arabic as "Ittahaddi". Tahaddi belongs to Al-Beheira Governorate and is located 75 kms away from Damanshour, the capital. In February 1967, Italconsult turned over the land to the Ministry of Land Reclamation. It is interesting to note that Tahaddi was officially inaugurated on June 5, 1967, the same day the Six Days' War was declared. Some questionnaire respondents felt that "Tahaddi" was an appropriate name as it refers to the challenge Egyptians encountered after the defeat of the Six Days' War. Tahaddi continued to operate as a state farm under the sponsorship

of the Egyptian Authority for the Utilization and Development (later Cultivation and Development) of Reclaimed Land. It was named Southwest Tahrir to distinguish it from its neighbor the South Tahrir Province. Later, the South Tahrir Company assumed administrative responsibility for Tahaddi. During this period, Tahaddi was overshadowed by South Tahrir. People in Tahaddi remember those years bitterly. They feel that Tahaddi suffered from "living in the shadow of South Tahrir, The financial monster that exhausted whatever little funds that were made available for the development of Tahaddi." ^{1/} Although it is almost impossible to financially verify the above-mentioned quotation, there seems to be enough evidence to show that the administrative relationship between Tahaddi and South Tahrir is a major source of friction for many Government employees in Tahaddi. (This point will be elaborated later in the report).

Farm Sectors and Villages

2.18 Tahaddi is divided into seven farm-sectors. Only five are reclaimed and inhabited by settlers and graduates.

Text Table 2.2

Farm Size in Tahaddi

Al Nagah (the capital)	5,246	feddans
Al Ma'araka	6,723	"
Al Kifah	5,226	"
Al Azimah	4,288	"
Ayn Galut	5,564	"
Al Falugga	4,557	" (unreclaimed land)
Al Tall Al Kabir	<u>2,971</u>	" " "
Total	34,575	feddans
Public land	<u>2,500</u>	
	37,075	

2.19 There are 17 satellite villages in Tahaddi. In each of the seven farm sectors there is one main service village and two or three surrounding satellite villages (Ezbas). On the average there are 225 houses in each service village and about 130 houses in the satellite Ezba villages.

^{1/} Quoted from an interview with a government employee whose name will be withheld due to the sensitive nature of the topic.

Villages in Tahaddi

<u>Central Service Villages</u>	<u>Satellite Villages</u>
Al Nagah	Village No. 29 Village No. 30 Mirtah Village
Al Kifah	Al Muntafi'in Al Muhagrin Village No. 20
Al Ma'araka	Sinnfa Village No. 3 As'Saidda
Al Azimah	Al Muntafi'in Al Mahagrin
Ayn Galut	Village No. 34 Village No. 37
Al Tall Al Kabir	Village No. 6A Village NO. 6C
Al Faluga	Village No. 3A Village No. 3B

2.20 Naming the villages: Officially, all Tahaddi villages were not given names but are referred to by numbers, and alphabet letters. As people started to settle in these villages, they began to give the villages names that are sometimes indicative of the origin and the nature of the group of people who inhabit these villages, e.g. Al Munafi'in means "settlers" in Arabic, Al Muhagrin means "the immigrants", referring to immigrants from Sinai and the Suez Canal cities, and As'Saidda refers to people from Upper Egypt. Whenever a village is inhabited by more than one group, a neutral name is selected. That is why villages are often named after the number of the irrigation pump station nearest to them.

Sociological ConsiderationsThe Beneficiaries of Land Reclamation Projects

2.21 The case of Tahaddi: There are no official census data available for Tahaddi. However, the following figures are based on approximation that are verified by the sociological research findings:

Tahaddi's Population

	<u>No.family members</u>		<u>No.individuals</u>
(a) Settlers	1,051 x 6	=	6,306
(b) Graduates	554 x 5	=	2,216 ^{1/}
(c) Gov. employees	797 x 5	=	3,985 ^{2/}
(d) Immigrants (Suez & Sinai)	8,000 x 6	=	4,800 ^{3/}
Total			<u>17,307</u>

Migration Movements in Tahaddi

2.22 Settlers: Although the MLR has a well-developed set of norms for the selection of settlers in the newly reclaimed lands, the actual process of settling Tahaddi can be briefly described as total confusion. Settlers were recruited haphazardly, and false propaganda was used to entice peasants to move to the New Land.

2.23 Broken promises: In 1968, the South Tahrir Province's administrators visited the neighboring villages and reported to village chiefs and peasants the prospects of moving to Tahaddi. Peasants were promised three or five feddan lots and free homes. Many trucks arrived in Tahaddi carrying hopeful, landless peasants, but actual distribution of land to those settlers did not take place until eleven years later. In 1978, 3,500 feddans were distributed to settlers in Ma'araka with an average holding size of three feddans.

2.24 Between 1968 and 1971, Tahaddi received settlers from Munifeya, Mit Gamr, Beni Suef, Suhag, and Al Sharkeya. The following chart shows the flow of settlers to Tahaddi.

-
- 1/ It is estimated that only 30 percent of this figure actually live in Tahaddi.
- 2/ It is estimated that less than 50 percent of this figure actually live in Tahaddi.
- 3/ About 60 percent have left Tahaddi to return to their village of origin.

Settlers' Families

<u>Year</u>	<u>No. of Settlers' Families</u>
1968-71	66 families
1972	20 families
1978	965 families
1979	300 families
	(expected to arrive late 1979)
Total	1,351

2.25 Graduates: Another group of people who live in Tahaddi are the graduates, Al Xirigeyn. They are either university graduates, who majored in agriculture or high school graduates. The Egyptian Ministry of Land Reclamation made it possible for university graduates to buy, on credit, 30 feddans of the newly reclaimed land. High school graduates are allowed to buy only 20 feddans.

2.26 In 1977 the first graduates arrived in Tahaddi. There were 144 in this group. They were joined by another 410 graduates in 1978. It is interesting to note that there are only two females in this group of 554 graduates, neither lives on, nor personally supervises their lands.

Text Table 2.6

Graduates in Tahaddi

<u>Year</u>	<u>No. of Graduates</u>
1977	144
1978	410
Total	554

2.27 Not all graduates live in Tahaddi. Graduates can be divided into three groups:

- (a) Those who supervise their land and reside in Tahaddi
- (b) Those who supervise their land but are non-residents of Tahaddi
- (c) Those who own the land, but sublease it and are absentee landlords

2.28 Percentages of each group are difficult to procure. Legally all graduates are supposed to supervise and live on their land but many do not. On a preliminary level it was revealed that the poor quality and lack of complete infrastructure services discourages graduates from bringing their families and settling in Tahaddi. The quality of the existing infrastructure will be further investigated in this report of feasibility study.

Text Table 2.7

Migration Movements 1977-78

<u>Co-ops</u>	<u>First Migration Movement 1977</u>		<u>Second Migration Movement 1978</u>	
	<u>No. of Grads.</u>	<u>Land Size</u>	<u>No. of Grads.</u>	<u>Land Size</u>
Al Azima			60	1,076
Al Iman			34	1,084
Al Sumud			85	1,650
Al Kifah			67	2,150
Al Ubur	68	2,090	36	1,046
Sita October	62	1,132	26	606
Ayn Galut			45	1,336
Al Tahaddi			71	1,417
	<u>Total No. of Graduates</u>		<u>Total Land Size</u>	
Al Azima	60		1,076	
Al Iman	34		1,084	
Al Sumud	85		1,650	
Al Kifah	67		2,150	
Al Ubur	104		3,136	
Sita October	88		1,738	
Ayn Galut	45		1,336	
Al Tahaddi	71		1,417	
	<u>554</u>		<u>13,587</u>	

2.29 Immigrants: A third group of people living in Tahaddi are the immigrants. These are immigrants from the Suez Canal cities and the Sinai Desert who lost their homes during the wars. Accurate figures on the number of immigrants were not available. However, sources indicated that there were approximately 4,800 individuals, of which about 60 percent have now returned to their original homes. People in Tahaddi make a distinction between Bedouins from Sinai and Bedouins from the Western Oases of Egypt. People from Sinai are locally referred to as Arab (Arabs), while people from the Western Oases are referred to as Maggarba (people from the West).

2.30 Government Employees: A fourth group of people living in Tahaddi are government employees. These are teachers, managers, engineers, social workers, clerks, etc. The majority of government employees live in Al Nagah, the capital of Tahaddi.

2.31 Distribution of population: The following is a chart which shows the distribution of the four groups: settlers, graduates, immigrants, and government employees in Tahaddi's sector. It should be noted that the percentages in this chart are based on approximation rather than actual figures. Actual figures are almost impossible to obtain because of the unstable nature of the population, and a lack of census figures in the area.

Text Table 2.8

Village Composition in Tahaddi

<u>Farm Sector</u>	<u>Graduates</u>	<u>Settlers</u>	<u>Government Employees</u>	<u>Immi-grants</u>	<u>Others</u> ^{1/}
El Nagah (Capital)	30%	3%	60%	1%	6%
Al Kifah	25%	10%	1%	63%	1%
Al Ma'raka	-	95%	2%	-	3%
Al Azima	30%	5%	15%	50%	-
Ayn Galut	-	-	2%	98%	-

Beneficiaries' Socio-Economic Profiles

2.32 Settlers: A socio-economic profile. This sociological survey rendered the following information about beneficiaries in Tahaddi:

Sample	150 settler families which is 14% of the settlers- population of 1051 families.				
Age	<u>20-30</u> 20.0%	<u>31-40</u> 23.3%	<u>40-50</u> 32.7%	<u>51-60</u> 18.0%	<u>Over 60</u> 6.0%
Marital Status	Married 97.3% Widowed 2.7%				
Family Size	6.3 individuals (641 children)				
Literacy Rates	Read and write 25.3% Read but cannot write 3.3% Illiterate 71.3%				
Polygyny	One wife 94.6% Two wives 5.4%				

^{1/} This refers to private sector groups e.g. merchants, barbers, etc.

Ethnic Origin	41.3% Dakahlia 29.3% Munifiya
Arrival Date	1950-1976 (Majority 1967-68-69)
Educational Status of Children	1:2 ratio
Former Occupation	Farm laborers, land owners, tenant farmers
Residence	62% owned homes in their villages of origin
Participation in Self Help Projects	76.7% participate Building mosques, paying to fix water pipes, build a cemetery, donations for operating budget of CD classes.
Spare Time	Stay at home, or visit friends
Life in Tahaddi	94% would like to stay 6% would like to leave
Size of Production Units	97% own 3.3 feddans 3% own 6.6 feddans
Annual Labor Cost	LE 43.06
Annual Production Cost	LE 96.5
Annual Net Revenue	LE 426.26
Would you like to Continue farming in Tahaddi?	94% Yes 6 % No
Wouldlike to see the following in Tahaddi	Grinding mill, market, irrigation wells, telephone and mail office, potable water connected to roads, peas-canning factory, hospital, secondary school classes, consumer co-op, ambulance, fire station, veterinary station, club and movies

Work in graduates' Lands	Do not work for graduates 80% Seven to ten days a month 20.0%
Farm Animals	One donkey 50.0% One cow 31.7%
Would you recommend Tahaddi to your Friends?	87.3% Yes 12.7% No
Why Not?	"There are many people here". "People here cannot make enough money to eat". "It is hectic here". "We work very hard to eliminate these weeds". "I don't want to see anybody from my village". "They will not succeed here". "The workload is very heavy here compared to the Old Land".
Why did people leave Tahaddi?	"They did not know what it means to be a farmer". "They do not like to work hard, they had no money, they were not peasants". "Our wages were low". "They did not believe that they will get land - our wait was a long one". "The mountains were scary". "Life here was very difficult". "They owned land in their villages so they returned to it".
Settlers' Wives	96.8% reported heavier work load than in the Old Lands. "I work at home and on the land too". "I participate in all the jobs my husband performs". "The weeds here require more labor". "In the Old Lands it was against the customs for women to work in the land. Here it is different". "I work in the graduates- lands to make some extra money. There are more opportunities to work here".
Would you like to Continue living in Tahaddi? (Asked of 93 female settlers)	96.8% Yes 3.2 % No

Why? "We own land here, it is home for us here, we have nothing left in the Old Lands....more psace here". "People will laugh at us if we go back to the Old Lands". "It is a sign of failure, this is our land, it will be passed on to our children".

Do you own any Jewellery? 9.3% own golden earrings. Most respondents reported having to sell their jewellery items for the purpose of buying manure and extra fertilizer bags for the land.

Do you use any Birth control Method? 19.6% Yes
80.4% No

Why Not? "The land needs labor, more kids are the answer". "Birth control pills are harmful to women, they make you weak". "The pills are no good, they do not work". "The pills cause bleeding". "I cannot find the pills at the Health Unit and I would like to have more male children".

What method do You use? Birth control pills.

Do you worry about your husband getting rich? 12.0% Yes (Impact of females' fear of polygyny)
88.0% No

Why Worry? "You cannot trust men with money in their hands". "He wants more kids". "My mother told me not to trust men".

Why not worry? "We have children, why should he get a new wife?" "He is an old man. He can hardly keep up with me". "He is a good man, he would not do something like this". "I do not care even if he gets a new wife, it is O.K. - our religion makes it possible for a man to have more than one wife".

2.33 Graduates: A profile:

Graduate population in Tahaddi	554	
Data Base	64	11.55%
Sex	63 males	1 female (28 wives)
Marital Status	98.44% married	1.56% single
Average number of Children	2.85	
Prior farming Experience	University grads.	75.6% Yes
	Secondary grads.	78.9% Yes
Average Annual Family Income	LE 93.02	
Positions prior to Tahaddi	Farm managers, teachers, cotton graders etc.	
Present Annual Farm Income	<u>Univ. grads (20 fd)</u> LE 2201.55	<u>Sec.school (15 fd)</u> LE 1550.65
Annual Labor Costs	1707.40	1384.72
Annual Production Costs	340.00	255.00
Annual Net Income	LE 154.15	LE 89.07
Farm Animals	Two water buffaloes, two cows, four sheep, three calves, two donkeys	
Land Type	32.81% <u>Hiddi</u> ^{1/} 10.94% Below <u>Hiddi</u> 29.69% Poor 17.19% Combination 9.39% Did not indicate land type	

1/ Hiddi is a term used to refer to the best type of reclaimed land which is expected to have a production value that covers its cost.

2.34 Residence:

	<u>University Graduates</u>	<u>Secondary School Graduates</u>
Resides in Tahaddi	58.14%	83.33%
Does not reside in Tahaddi	41.86%	16.67%
Housing	Build home in Tahaddi	84.38%
	Did not build home	15.62%
	Prefers house ready upon arrival	51.56%
	Prefers to build himself	48.44%
Ideal House	3 bedrooms, living room, kitchen, bathroom and shower, garage, storage area, fenced and on the land.	
Do you regret the decision to take Land in Tahaddi	48.44% Yes	
	42.19% No	
	9.37% Not sure	
Would like to see the following in Tahaddi	Wells for irrigation Improved power stations Credit for purchasing farm machinery Improved marketing system Hospital Club Secondary school classes Consumer co-op Agric. extension service Ambulance Improved communications Improved veterinary services Animal feed factory Labor camps Bakery Improved roads Improve the quality of water	

2.35 Graduates' Wives:

Employment Status	64.28%	employed
	35.72%	housewives

The role of graduates' wives in the New Land Help in supervising laborers
 Raise chickens
 Raise farm animals
 Housework including baking bread, making jam, etc.

Do you practice Birth Control 90.90% Yes
 9.10% No

Would like to see in Tahaddi Classes for improving poultry raising techniques
 Classes in home economics
 Classes in needlework and sewing
 Bakery
 Child care center
 Butagas distribution center
 Consumer co-op at Azima
 Milk factory

2.36 Government Employees: A socio-economic profile:

Sample 50 people were interviewed. Total number of government employees in Tahaddi is 797. The sample size is 6.3%

Sex Males 86% females 14%

Marital Status 96% married
 4% single

Family Size 5.3 individuals

Average Age 36 years

Spouse Employment 24% employed, 76% unemployed

Status 76% housewives

Average Annual Income of a family with a Single Wage Earner LE 34.18

Average Annual Income with Two Wage Earners LE 62.42

Would like the following improved in Tahaddi Distribution and quality of potable water, efficiency level of the electric stations.

Would like to see added to Tahaddi	Secondary school Hospital Consumer co-op Fire station Mail and phone service Ambulance Agric. business
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For females only:

Birth Control	83.3% Yes 16.7% No
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Womens' problems in Tahaddi	Lack of social life Lack of infrastructure services Inadequate housing
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Would like to see added to Tahaddi	Womens club Movie Theatre Class in home economics Maternity hospital Ambulance Price control on important consumer items Pharmacy Day care center Telephone service
------------------------------------	--

Are you happy in Tahaddi?	36% happy 64% unhappy
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2.37 Migrant Farm-laborers: Two visits were paid to Salah El Din Seasonal Farm-laborers' Camp, and a Tahaddi camp. Salah El Din Camp is located in Um Sabir, one of the central villages of South Tahrir. The Tahaddi Camp is located in Nagah, the capital of Tahaddi. The South Tahrir Camp had 400 farm-laborers. The Tahaddi Camp closed its operations early this year after agricultural land had been distributed to settlers. In a visit to Salah El Din Seasonal Farm-laborers' Camp, 44 individuals were briefly interviewed and responded to our questionnaire.

2.38 Description of Salah El Din Camp: This camp is comprised of one bakery with a kitchen and bathroom attached, one storage building for storing used kitchen appliances, blankets, mats, etc. There is another storage building for food items, e.g. flour, cheese, beans. Sixteen other buildings are designated as sleeping quarters, each capable of housing approximately 50 persons.

2.39 Description of Tahaddi Camp: The Tahaddi Camp is built to house 400 laborers. It consists of two buildings. One that has a kitchen, dining hall, bathroom and storage room. The second building consists of large bedrooms, showers and bathrooms.

2.40 Salah El-Din Camp: Ethnographic data of farm laborers in the New Lands:

- (a) All respondents are recruited by contractors. These contractors charge the company one piaster^{1/} per individual daily. Adult males earn 50 pt daily and might work overtime (after four o'clock) to earn an extra 20 to 25 pt per day. A female earns 30 pt daily. Children earn 25 pt daily.
- (b) A contractor assumes full responsibility for the work of his crew. He also organizes all sleeping arrangements. Contractors exercise a great deal of power over seasonal farm-laborers. They decide who can join their crew; they maintain peace among members of the crew; and they are responsible to the company for the quality of the work of their crews.
- (c) All respondents work 29-30 days a month, and go for one or two days' visit to their villages. Some do not leave the camp except for every Muslim feast.
- (d) Many of the respondents are accompanied by relatives, e.g. sons and daughters, or brothers and sisters.
- (e) Many prefer to travel weekly to see their families, but their wages are too low to support four monthly visits. Moreover, many expressed their dissatisfaction with public transit.
- (f) Because of the lack of potable water, all respondents drink and bathe in the canal.
- (g) A constant source of complaint is the housing arrangements. Males and females sleep in the same room. Very little space is allowed for individuals who sleep on mats on the floor. Some complained of bedbugs, fleas, rats and occasional snakes on the camp grounds.

^{1/} There are 100 piasters in an Egyptian pound.
A pound is equivalent to U.S.\$ 1.43.

- (h) They expressed a desire for a recreation room where a TV set and movies can be shown at night.
- (i) Each sleeping quarter houses one contractor and his crew of 50 people who primarily belong to one village.
- (j) Salah El Din Camp is designed to house 1200 laborers. At the time of the visit it only had 400 laborers.
- (k) Because of low wages, the camp is having trouble recruiting laborers. Although the South Tahrir Company administration favors laborers from Menufiya because they have the reputation of being hard workers, they are forced to hire from Beheira whose laborers are stereotyped as being "lazy".

2.41 Laborers origin: Most of the respondents are recruited from nearby governorates. Contractors submit their lists of laborers and sign annual contracts with the employment offices in the various governorates.

2.42 Literacy rates: 68.2% of the respondents were illiterate; 29.6% were capable of reading simple Arabic phrases and only 2.3% were capable of reading and writing.

2.43 Number of children: 28.6% of the respondents had 5 children. Farm laborers favor large families because children's earnings supplement the family income.

2.44 Food: The Egyptian government subsidizes food for farm-laborers. Each laborer is entitled to five loaves of bread per day, beans for breakfast, a piece of cheese for lunch, and a hot meal for dinner. Dinner is usually served at 5:00 p.m. and consists of vegetables, rice and beef.

2.45 Marital status: 68.2% were single, and 31.8% were married. Married couples are given a small corner that is separated from the rest of the group by a curtain for privacy. Contractors prefer single laborers over married ones because of the space limitations in the camps.

2.46 Problems of seasonal (migrant) farm laborers at Salah El Din Camp:

- (a) Administrative problems between the South Tahrir Camp and the organization for development within the MLR. Now the camp is under the direct supervision of the company.

- (b) Lack of cleanliness in bedrooms (bedbugs)
- (c) Frequent power shut-offs
- (d) Lack of potable water
- (e) Bathrooms are locked and not in use because of water shutoffs
- (f) Bad quality food
- (g) Bugs in bread, unpeeled vegetables and late meals
- (h) No privacy in sleeping arrangements
- (i) Lack of recreational activities
- (j) Low wages
- (k) Insufficient blankets
- (l) Lack of educational programs
- (m) Inadequate oven construction leading to fires and burn accidents
- (n) Lack of health services (the doctor left because there was no budget for medicine)

Settlement Impact on Beneficiaries

Case Studies from Tahaddi (New Settlement)

2.47 Mohamed and Sabah: In 1968, Mohamed Ahmed^{1/} was a 40-year-old landless farmer when he decided to go to Tahaddi. He lived at one of the small villages close to Kom Hamada, a town that belongs administratively to Damanhour, a governorate of Lower Egypt. He made his living as a farm-laborer working about 240 days a year for other farmers in his village. There were times when he had to join the crews of migrant farm-laborers to neighboring villages. He ceased to work as a migrant farm laborer after he married Sabah, his 18 years old cousin (father's brother's daughter). He married at the age of 32 and has four children to support. Mohamed's daily wage, working from 8 a.m. to 4 p.m. was 50 pt. This meager annual income of LE 120 could not possibly have supported his family if it had not been for Sabah's contribution to the household budget. She raised chickens, geese, and sometimes rabbits, and sold them in the nearest town. She also sold eggs and cheese every Thursday in the town's market. Sabah said "My chickens and geese sell for good prices. Were it not for the chicken disease Al fira, I could become rich". She had an estimated annual income of about LE 50.

2.48 Sabah remembers the days she spent at her village of origin as "the good old days where I worked only at the house; I took care of the children, washed the laundry, cooked and went to the market to sell my chickens every Thursday. Our neighbors were friendly and my family sent

^{1/} In this report, all case studies have fictitious names to ensure anonymity of the respondents.

me bread and cookies every time they baked. The only problem I had was my mother-in-law who interfered in my life and shamed me because I had three girls. Thank God I got a boy so she knows that I am not all that bad".^{1/}

2.49 Life was quiet for Mohamed and Sabah, until one day Mohamed heard that his neighbor Ali was going to the South Tahrir Province to own three feddans. When Mohamed expressed interest in going also, Ali referred him to Al Hadj Ahmed, a well-respected owner of two feddans. Al Hadj Ahmed told Mohamed that a committee would arrive in the village in a week to interview applicants to go to the New Lands. Mohamed trusted Al Hadj Ahmed as he is a kind and honest man. He thought perhaps he should follow him without asking too many questions. However, he said in a low voice, "But people say it is a mountain (my father), and how can you grow things on a mountain. And how about my family and my friends", Al Hadj Ahmed was literate, and he had read about land reclamation projects like South Tahrir. So he said, "You think I will sell the two feddans and leave here for nothing? You can grow everything there except maybe cotton, in the sandy soil. There are many people who will apply, so if you want to go, let me know so I can put in a good word for you. What have you got to lose anyway? I do not see the palace that you will leave behind. Depend on God and see the committee. You might be a land-owner one day".

2.50 Mohamed's dream was to own land. Land to him meant everything. It meant hard work, but it also meant dignity and respect, and a better life for his four youngsters.

2.51 Mohamed decided he would see the committee, but not apply. He cannot possibly leave his old parents who need him close to them. It is true that he really wanted to own land and live in a brick-built house, but only bad people leave their parents in their old age. Perhaps he could take his parents with him, but his wife would object because she hates his mother. Mohamed thought he should not even tell his wife a word about his intentions to see the committee.

2.52 Two committee members were interviewing applicants at the village chief's house. Mohamed listened to them telling peasants about the New Lands. Each person is

^{1/} In Egypt, peasants believe that females are responsible for the sex of their offspring.

promised three feddans, a house, and maybe even cows on long credit. He believes this must be a trick. He does not trust government officials. But Al Hadj Ahmed can be trusted. He seems to encourage people to go to the New Lands. But, maybe the government paid him off to do this, he thought. No, this cannot be true, Al Hadj Ahmed is a man of God. Why should he trick people? Mohamed decided to apply, and wait to see what happens. There is no obligation to go, but if his parents know he applied to go to the New Land, his mother might die from grief. He thought he would assure her that he applied only to make sure that he would not miss something good. But he will assure her that he would not leave.

2.53 Sabah asked him about the gathering at the chief's house. She wanted to know what he thought of people who leave to live in the mountains. He did not mention that he had applied to go. But he said "Anybody that leaves their village of origin and parents behind, has no goodness in his heart". Sabah fantasized about living far away from her nagging mother-in-law and even was guilty of wishing her mother-in-law dead.

2.54 After a few months, Mohamed was told by Al Hadj Ahmed that he should get ready to leave to South Tahrir in two weeks. Mohamed could not believe his ears. Now he had to tell his wife, and what is worse, to tell his mother of his intentions to leave. But his mother should not get angry because she had six other sons and daughters living near her. He was sure that he would visit often. His family had not done much for him anyway. He was not sent to school, he had to work ever since he remembered, so why should he worry about others? His wife would follow, as that is her duty as a wife to follow her man. But she might scream and make a lot of fuss because he did not tell her.

2.55 Mohamed gathered his courage and told his mother who cried and said, "The country that you know is better than the one you do not know, my son. Stay here so I can fill my eyes with your image, and your children's image before I die". He assured her that he would visit her, and perhaps send for her to come and live with him in his brick house.

2.56 Convincing his wife to leave her village was not as bad as having to ask her to sell her golden earrings to have cash when they arrived in the New Land. The earrings would sell for ten Egyptian pounds, and he had nothing else to sell except the cow he owned. He was determined not to sell the cow or the house until he was assured of the land distribution. He promised his wife

other earrings as soon as he had harvested the first crop. He said, "Sabah, do not be foolish. You will be the wife of a landowner. I will be a landowner. We can send our children to school. We will have a brick house, electricity, water. I will be a man that is respected, instead of being kicked around by landowners here. Give me the earrings". Sabah had her reservations about leaving the village. She would miss her family, but she would love to leave her mother-in-law behind. She feared her husband getting rich, because he would probably marry another woman. She knew how men are, her mother had taught her, "You trust men, you are trusting water in a sifter". Her mother was always right. Why should she sell her earrings, her only valuable possessions and her security against men's inherent infidelity. However, if any good came out of the move it would reflect on her children. She informed her husband after two days that he could sell the earrings.

2.57 The Ahmed family moved to Tahaddi, called South-west Tahrir then, in 1969. Mohamed was told to work hard as a farm laborer for the Shalish system, farm laborers on state farms. He knew that if his work was satisfactory, he would get three feddans. The Ahmeds were excited about the fact that their house was built out of red brick, a symbol of wealth to Egyptian peasants. But, alas, the house was too hot, as there were no windows for ventilation. The two rooms were dark, since the only source of light was a hole in the ceiling. Sabah was unhappy that her house was so warm that she could not stay indoors during the day. Staying outside the two rooms meant being in the hot sun all day. There were no trees, and sometimes the wind blew the sand, to her the wind storms indicated God's anger.

2.58 In spite of all the problems with the house, it was the only bright spot in the Ahmed's lives. The Shalish system paid 50 pt as a daily wage for Mohamed who worked in the fields from 8.00 a.m. to 4.00 p.m. The 50 piasters were not enough to support his family. So Sabah had to work in the fields too. Sabah objected saying, "First you bring me to the mountains, you sell my earrings, and now you ask me to work in the fields. If my family knew what you are doing to me, they would probably kill you. And who will take care of the children if I work. We have no relatives. We are like a tree that has been cut off and will die in the desert". Sabah knew that either she or the oldest child, who was only 6 years old, had to work. "The neighbors can look after the children while I am gone". Sabah earned 35 pt as a daily wage. Life was difficult. She was often absent from work because the children were sick. After four months of working for the

Shalish, she stopped work. This was after her third daughter died suddenly. Sabah knew that, "It is the burning sun that killed her". Heartbroken, the Ahmeds had to return to their village of origin to bury their daughter. There were no cemeteries in Tahaddi then.

2.59 The Ahmeds avoided making any comments about their lives in the New Land. Sabah said, "We could not say that we were starving, because that would bring shame to our families. We had to sell our cow to pay for the child's burial. We returned to Tahaddi in a week. We returned because we expected the distribution of land to take place fairly soon".

2.60 However, life under the Shalish continued beyond the promised six months. Rumors spread that there would be no distribution of land. Mohamed knew that many of his neighbors had packed and left Tahaddi. They had something to which to return. But he had sold his cow, his wife had sold her earrings and he had no land. There was nothing to go back to except people who would laughingly say, "I told you not to leave, but you are foolish, you don't listen to others". He had no choice but to stay. Sabah could not work as she had again become pregnant. Mohamed worked two shifts, but the Shalish manager paid him half of what he earned. He had to accept it, or they would stop his employment. He had to pay off the Shalish clerk or his name would be excluded from the list of actively employed farm laborers.

2.61 Sabah expected her baby in six months. This meant a trip to her family's village. Mohamed had no savings and nothing he could sell. He decided that his oldest daughter, then seven, had to go to work. The 25 pt the girl received as a daily wage was not enough to build up the necessary savings for the trip. Mohamed approached Al Hadj Ahmed for a loan of ten pounds. Al Hadj Ahmed gave him the money and wished him luck. Al Hadj Ahmed felt guilty because he was responsible for bringing many of his fellow villagers to Tahaddi. Time went by without any land distribution taking place. Many villagers went back to their villages of origin, especially those who either had something to go back to, or had a small number of children and therefore could not earn enough money with the Shalish system. Al Hadj Ahmed stayed because he felt morally responsible for this situation. He also could not face his village.

2.62' In 1977, a group of 144 graduates received land in Tahaddi. Each graduate had 20 or 30 feddans according to their academic qualifications.^{1/} There was a tremendous need for labor. The two oldest daughters worked, and Sabah

^{1/} Agricultural high school graduates receive 20 feddans; agricultural university graduates receive 30 feddans.

went to work for the graduates. Mohamed continued with the Shalish until he felt comfortable with the graduates' system and he could leave the Shalish. The day he left was the happiest day of his life. He said "I felt a rock was taken off my chest. I had to endure the humiliations of the Shalish clerk, the insults of the farm managers, and the low wages on top of all that. I felt I was reborn".

2.63 Working for the graduates did not provide him with his life's dream to be a landowner. However, his pay was 80 pt daily, his wife was getting 60 pt, and his daughters were earning 50 pt each. They worked about 200 days a year. The Ahmeds' only son went to school. The school was free, but he needed a school uniform, shoes, and school supplies. Mohamed insisted that the boy had to go to school. He wanted to see him grow to be an agricultural university graduate. The girls did not have to go to school because they would have to get married at an early age. Spending money on their education would be like throwing money away. They could work until marriage time.

2.64 At the end of 1978, Mohamed heard rumors that land would be distributed soon. Al Hadj Ahmed confirmed these rumors, saying "It is about time. I would like to own the land before I die". Mohamed was cynical. He maintained, "We have heard about land distribution for the last 11 years. Why does anyone have to bother to think about us poor people. We do not count. We do not change anything. Naturally no one will listen to our complaints".

2.65 In January 1979, Mohamed was given 3.3 feddans. He could not believe his eyes when he saw his land lot at Al Ma'raka. He knew that he had to work very hard on the land. Weeds were taking over the crops. As a state farm, the land was neglected. The Shalish laborers did not feel that the land was theirs, and the wages were low. There were no incentives to work hard. This was his land now, he had to clear the weeds, make sure that the crops were watered at the right time.

2.66 Mohamed said, "The land is good, but you have to give to the land in order to take something from it. You have to put fertilizers, manure, top soil, water on time, and clear the land of weeds. It is hard work for me and my wife. The girls help too, but they prefer to work for the graduates. They earn 75 pt each. It is good money. Finally God realized our dream. But this sprinkler irrigation system is the work of the devil. Water shut-offs are frequent. It affects our crops. My berseem, (fodder) died last winter because of the winter closure.^{1/}

^{1/} During the month of January all canals are closed for annual maintenance. The period is normally January 19th to February 9th.

I work very hard. I do not mind it. It is my land. But my crops die in front of my eyes. I am helpless when the power station is off, and the sprinklers do not work. I contributed money to fixing the pipes and the booster stations several times. Now I have nothing left after I bought a donkey, and paid LE 50 for this miserable cow. I had to pay LE 50 as a deposit for the cow, and the graduates get eight cows for no deposits. Who deserves more help, the rich or the poor?

2.67 "We have no potable water other than what we get from the canal. The doctor is seldom present. But all this can be tolerated except for the irrigation system... it is our life here in the desert". Sabah confirmed this saying, "Now I work at home, and with the man at the field. I do not mind, but I am weak, and I often bleed from exhaustion. But this is our land, we went through a lot to get it...this village is home to us. I just wish we did not have that sprinkler system".

Case Study of a Settler from South Tahrir (Older Settlement)

2.68 Al Hadj Sayed is about 53 years of age. He is a settler from South Tahrir. He moved to South Tahrir in 1956. He comes from one of the villages of Mit-Gamr, Lower Egypt. He was the third son of a fallah, a farmer who owned ten feddans. He talked about his experience in South Tahrir:

2.69 "I went to school for six years. I was never interested in learning from books. I wanted to work with my hands. My father and my older brothers were farmers. I was envious of my older brothers because they used to work on the farm and I had to go to school. I decided I would not go to school any more. I taught myself how to read the newspapers. My cousin used to tutor me in poetry and the Quran. I farmed the family land and continued to buy books and read about the rest of the world. I got married at the age of 17. My bride was a 15-year-old cousin. She is the mother of my children now, my only wife. I do not believe in having more than one; people here, South Tahrir, have acquired two and three wives. God said if you can be fair to them, marry more than one. But one is plenty.

2.70 "I spent three years in the army working as a prison guard. These were bad years. When I returned to my village, I worked with my father on the family land. My family consisted of the harem^{1/}, the wife and two children.

1/ Local term that refers to a wife or a number of wives.

graduated from Cairo University's School of Agriculture at the age of 23. His first job was in Cairo with the Ministry of Agriculture. Later, he worked for the South Tahrir Company as a state farm manager. Working in South Tahrir was difficult because his wife Mona did not like to live far away from her mother. So she lived with her family for two years. Ibrahim had to commute to Cairo twice a week. After Mona had her first child, she decided to move to South Tahrir and got a job as a social worker for the South Tahrir Company.

2.72 Life in South Tahrir was not easy. Ibrahim and Mona missed their relatives and friends in Cairo. But after their third child was born, the couple had little time to think about their life in Cairo. They socialized with four other engineers' families, and South Tahrir started to feel like home. The oldest child went to a nearby primary school. The second child stayed at the town's community development nursery school. The baby was taken care of by a maid.

2.73 Ibrahim and Mona visited Cairo once every month. But as time went by, and the family grew in numbers, their visits became less frequent.

2.74 In 1976, Ibrahim heard of some agricultural university graduates who had applied to own land in Tahaddi. The government's offer was a tempting one. A graduate gets 30 feddans, eight cows, and about LE 4000 in housing loans. Ibrahim was bored with his job and did not like his boss. He had managed a state farm for ten years and his income was about LE 85. He knew that even with Mona's salary of LE 48, they could not save much. He wanted a car for the family, but their combined salary was just enough to make ends meet.

2.75 Ibrahim knew that if he applied, he would be selected because of his long years of experience in the New Lands. But leaving a secure government job for an unsure economic venture was risky. Ibrahim asked Mona how she felt about his resigning from his job. She objected to the idea and said, "Just because you do not like your boss, does not mean you threaten your children's future. You know all the problems of owning land. You need capital, and we have nothing saved. You need a car to go there on a daily basis. Then if something, God-forbid, happens to you, who will take care of the land. I do not know anything about farming. However, if you decide to go ahead and apply, do not count on me joining you with the children in Tahaddi".

We lived with my father, mother and my married brothers, all in one house. It was crowded, and I started to feel the pressures of knowing that I could never buy my own land. One day I heard that a committee was interviewing applications for the South Tahrir Province at the chief's house. I checked with my friends who encouraged me to apply. It was all right to live with my extended family, but you know how women are, they argue and talk too much. So I figured I had nothing to lose. My father was sad that I wanted to leave, but he wished me luck. I arrived here in 1956. I was then about 30 years old. The mountains were frightening, but we had so many supervisors helping us. There were many ladies who used to take my wife to literacy classes, sewing classes, animal care classes. I had to wear boots and overalls. The women wore a skirt and a scarf. We looked like city people. For a while it did not seem real. But the worst part of it was I had to work for 25 pt a day. I had to be patient to get the five feddans they promised us. I also did not like getting up when it is dark at 5.00 a.m. to salute the flag. I wanted to get a little bit more sleep. We were moved from one place to the other. But finally, they (the supervisors) said that Um Sabir is to be our village and the land around it is ours. I felt a great sense of pride. I worked hard and God rewarded me. Now I own three red-brick homes. I was elected to the Co-operative Organization. I come to meet with people in the Ministry. I speak for the settlers. I am thankful for what I have and I vowed to serve people. I travel a lot to Cairo, or Damanhour to get problems solved. One of my sons is a farmer who takes care of the land now and the other is an agricultural engineer. My daughter is an accountant. I did not want a large family. I wanted the children to get high degrees. God helped me, now it is my turn to serve and help people. My income, it is good, you know I never count the money, but with God's blessing we have eight cows, three donkeys, a truck and three homes too. The chickens and rabbits are more than any one person can count. I went to Mecca to perform the pilgrimage. I educated my children. What remains is to help others. I am on the board of the agricultural co-op. I have authorized loans for people who want to buy irrigation pump machines. Today I have to find traders to buy the peanuts that are stored in our co-op. Tomorrow I go to Cairo to meet with the Ministry people about the irrigation machine in the area. South Tahrir has been good for us".

Case Study of a Graduate

2.71 Ibrahim Abdel Moniem was 38 years old when he decided to leave his government job as a state farm manager in South Tahrir and own 30 feddans in Tahaddi. Ibrahim

2.76 Ibrahim talked to some of his colleagues who had submitted applications. The general feeling was that of optimism. Salah, a good friend of his, said, "You cannot lose. You will get a LE 4000 housing loan. We can use this to buy a truck. It will provide a means of transportation and also will be good for taking crops to the markets. You do not need capital. The government will help us. They are keen on making this program a success. Labor is no problem, since Tahaddi has many of the Shalish laborers who would love to work for us for some extra pennies. Go and apply. You will leave 30 feddans to the children, and with your government job you leave nothing. Anyway you have one year to try the system. If you do not like it, go back to your job".

2.77 Ibrahim applied. After two weeks of a tense relationship with his wife who was angered by his ignoring her advice, life returned to normal. A few months later, Ibrahim was informed that a certain lot was assigned to him, and he had to begin working on it in a month's time.

2.78 Mona knew that owning land in Tahaddi would mean that her income would be the main income of the family. Until then she had spent most of her salary on clothing for herself and the children, and on purchasing jewelry. It is the man's responsibility to provide for the family. Now the land would require capital, and the family would have to depend on her salary and the 60 percent salary her husband would draw in the first year of owning the land.

2.79 Ibrahim never questioned his farming experience. After all he had a university degree in agriculture, and he was a state farm manager. It was true he had never worked with his hands in the fields, but he did not need to because he would hire farm laborers to do this kind of work. He was not going to be alone. Certainly there would be other graduates with whom he could consult whenever he needed to.

2.80 Ibrahim discovered that he was not totally divorced from the bureaucratic environment that he hated and wished to leave behind when he decided to own land in Tahaddi. Now he spent more time in bureaucratic offices than ever before. He had to deal with government employees to fix the power stations, the booster stations, the pipes, etc. He was dependent upon their good will. Now he was no longer part of the power structure. He was not a state farm manager who had the power to make things happen. He had to beg, to cash in on the good will of some friends.

2.81 Ibrahim's second main problem was the fact that farm laborers were scarce, especially in the peak season of harvesting and seeding. Ibrahim had two farm laborers with their wives living on his land. However, the irrigation problems and the scarcity of labor forced him to utilize only 20 of his 30 feddans.

2.82 Ibrahim traveled several times to neighboring villages to hire farm laborers. He offered a pound as a daily wage for an adult male, 75 pt for a female, and 60 pt for a child. He provided transportation, food, tea and cigarettes. None of the villagers wanted to leave with him. They could get similar wages without having to travel to the mountains (desert).

2.83 Listening to another graduate talk, Ibrahim realized that his situation was not as bad as some other graduates. One graduate friend of his said, "We are living a tragedy here in Tahaddi. I wish I had listened to my wife's warnings not to take land, and to stay with the government. We made big sacrifices. I leave my family in Cairo; I am dressed in a galabaya;¹ I talk like the peasants; we live in filth; we have no social life, no labor; the power stations break everyday; our debt increases. I go to Cairo often because I have to spend time with my friends who lend me money to spend on this damn sand. I waste a lot of time in government offices to have pipes repaired, fertilizers delivered on time, etc.; so I don't have the time to supervise the laborers who think it is a state farm and play around."

2.84 Ibrahim is now in his third year in Tahaddi. Both the water and the labor problems seem to be getting worse. Ibrahim sees potential in the land. However, he knows that he cannot farm the land himself -- culturally, it is not acceptable -- and he cannot ask his family to farm either. Now he is dependent on both laborers and government employees. He bought a tractor and top soil with what little money he made off the land.

2.85 Laborers' wages ate up his small profit. Mona refused to move to Tahaddi. Her salary is the only dependable income. She never knows how much the land will bring. She does not like the idea of her husband being gone most of the day. She needs him to help her with the children when they do their school homework. She noticed Ibrahim is depressed. He has been thinking about leasing the land and leaving the country for Arabia as he has two brothers there. She does not mind this because they will be making more money, and he will have more time to spend with the children.

¹/Local peasant garment

2.86 The relationship between settlers, graduates, immigrants and government employees is far from harmonious. However, there seems to be a definite willingness among people to settle their differences and cooperate to make Tahaddi a better place for future generations. Settlers feel that the graduates are favored by the government employees because they are able to communicate easily with the employees, and the graduates are familiar with the Egyptian bureaucratic system. Because of this they are able to procure their agricultural needs more quickly and efficiently than settlers. On the contrary, graduates feel that they are not favored by the government employees but they suffer from the inadequacy of the services offered by the government more than settlers, who are supposed to be used to living in low socio-economic levels.

2.87 Ethnic group conflicts: Generally speaking, immigrants are not welcomed as a group. They are seen as impinging on these new communities, and utilizing whatever meager infrastructure services are present in the area. Immigrants draw welfare checks and are envied by settlers who have to work hard for their money. Conflicts between ethnic groups (Upper Egyptian vs. Sinai Desert Bedouins) have already caused several outbreaks of violence that resulted in the death of four people.

2.88 Ethnic factions: Settlers perceive themselves as a group that has general common interests. However, there are ethnic factions within settlers' aggregations. Settlers, whose ethnic origin is Upper Egypt, view themselves as superior to Delta fallahin (farmers). Upper Egyptian customs and dialects can be observed in Al Ma'rakah. Settlers who originally came from Upper Egypt live in this village.

2.89 Sinai immigrants: There seems to be a consensus that the region would be better off without the Sinai immigrants. There have been accusations of aggression, illegal dealings, theft, etc., made about the Sinai immigrants. These Bedouins are locally distinguished from the Maggarba (Bedouins of the Western Desert) and have clashed with Upper Egyptians in Ma'raka over leadership issues.

2.90 Despite these superficial differences, it seems that some complementary relationships exist among the various groups. Settlers depend on graduates in the following tasks:

- (a) Marketing agricultural products -- graduates own trucks that transport goods to neighboring towns.
- (b) Solving irrigation problems -- graduates usually have informal friendship ties with government employees.

- (c) Graduates will pay about LE 1.10 as a daily wage for an adult male laborer. Settlers who need cash take part-time jobs on graduates' farms.
- (d) Settlers buy fertilizer from graduates whose fertilizer allocations far exceed their land's needs.

2.91 Graduates depend on settlers in the following ways:

- (a) source of labor
- (b) source of cash. Settlers pay for the marketing services they receive from graduates, they also pay for fertilizers; graduates then sometimes sell their surplus fertilizer at black market value.^{1/}

2.92 Both settlers and graduates depend on government employees to maintain the infrastructure services available in the area.

2.93 Some government employees depend on graduates and settlers as clients who use the various mechanic and grocery shops that they operate in the area.

2.94 Immigrants depend on settlers as customers who use the private-transportations system. This is often owned and operated by immigrants living in Tahaddi.

2.95 Relationship between graduates and settlers: Generally speaking, the relationship between graduates and settlers is friendly and amicable. However, settlers know that their labor is crucial to graduates. They resent the fact that graduates get 20 or 30 feddans, whereas they only get 3.3 feddans. When settlers were asked, "What do you think of the graduate system?", the following are some of the comments that were made:

2.96 Settlers' comments to: "What do you think of the graduates getting land?"

- "It is O.K."
- "They are generally nice people, but some of them are arrogant."

^{1/}The black market value varies from one type of fertilizer to the other, but generally an average of LE 2.15 is charged above the co-op prices. Settlers buy the fertilizers at black market value because they normally need the fertilizer earlier than the co-op can deliver it.

- "They guide us when it comes to setting prices for the different crops."
- "They are rich people who own cars."
- "They know how to get things done with the government. They help us get the pipes fixed, were it not for the graduates, nobody will even listen to us."
- "They spend their money on cars, they ought to spend it on fertilizers and manure."
- "The government favors them by too many loans."
- "Their land is neglected, it has many weeds."
- "They are O.K., they are educated."
- "They use the power station to their benefit. They want television. We ought to conserve in the use of power here. When this station breaks we will all have to leave."
- "We want loans like the graduates."
- "They rent their tractors to us."
- "The wages we earn from them are good for our families."
- "The hippie graduates don't want to work with their hands. They don't want to get dirty."
- "They can't live without our labor."
- "They have many problems."
- "Thirty feddans are too many for one graduate."
- "They raised the price of labor for us."

2.97 Settlers elaborated on the above comments as follows:

- "They are well educated, but they can't think right." When they were given loans to build, they spent it on cars; you put the money into the land in order for it to give you something back."
- "They are O.K.; they set the prices for us; we see what their crops sell for; then we follow the lead."
- "We work in their land whenever we have time. It is a good source of income, but they make us work. It is sure not like a state farm."
- "The hippie farmers can't make it without us and our labor. They don't want their hands dirty. They still order and boss us, but it is not a state farm where we were treated as slaves. They are land owners, we are land owners."
- "Their land is full of weeds, no good farmer can tolerate that. Even I, an ignorant man, know that the

- weeds are not good for the crops."
- "They put pressure on the government to fix the pipes, the power stations, etc., without them no one would be able to get anything done. They know how to talk to the government people; they have friends."
 - "The government is spoiling them by giving them too many loans -- they buy cars, and suits -- the money should be spent on manure and fertilizers."
 - "The government helps them more than they help us -- yet their land looks bad, their yields are low, their animals are neglected. Once you go to school and read too many books this ruins your mind (implies you lose your common sense)."

2.98 Graduates said the following about settlers:

- "They know that we need them badly, so they demand high wages. The lousiest kid costs 75 pt. A government employee university graduate does not make as much when he starts his career. Then they want tea, cigarettes, food. Why do I have to pay for these things when they get high wages? They are richer than we, and do not have the expenses we have."
- "They joke among themselves about our yeilds and the weeds on the land -- the settlers here did not know anything about farming when they first arrived in Tahaddi. We (former farm managers) taught them how to farm. They have never seen a sprinkler system before. I used to teach these buffaloes, now they turn me down when I need their kids to work on my land. These settlers were the lowest and poorest segments of rural Egypt -- now they own lands -- they think they are beyhs^{1/}."
- "Without us (graduates), settlers would have no irrigation water. We get the power and pump stations fixed using our contract with the people at the headquarters. The settlers are envious of us because we have more land, but we have more expenses, too. The needs of an educated family are more than the needs of a non-educated family."
- "They should never have distributed land to settlers. How are we supposed to find labor now? They control our destiny here. I have to leave my peanuts in the ground until the settler harvests and gets his cash, then labor becomes available. The settlers make more money from their three feddans than we do from 20 feddans."

^{1/} A title used in Egypt to refer to a man of high social authority or rank.

2.99 Complementary relationship: The general consensus among people in Tahaddi is that a complementary relationship exists between settlers and graduates. The graduates use their contacts to have repairs made to the irrigation system; this benefits settlers. The settlers' children work on the graduates' lands and fulfill the labor needs of graduates. This dynamic relationship is often strained by settlers demanding more wages for their labor.

Case Study: Migrant Farm Laborers

2.100 Salma is a ten-year-old girl who works on the South Tahrir state farm as a farm laborer. Salma earns LE 7.50 a month. I interviewed her at the farm labor camp where she lives. She described her life as follows: "I came here with my father and brother early this year. But my father is sick now, so I have to work and give my wages to my family. My mother would join us if it were not for my six month old baby sister, and my two younger brothers. I live in the camp here all month except for one day when I visit my family in the village. I eat good food here, but many times the bread has worms. I eat some meat here but my family eats meat only on rare occasions. So the food is O.K., but I miss my mother and my younger brothers. Sometimes I wish I could live at home with them, but I know my brother and I are older than the rest of the children, so we have to work. I used to cry every time I had to leave for the camp, but now I have some friends here and it does not bother me anymore. I have to work hard or A'm Fahmy, the contractor, would fire me, and my father would beat me. So I work with other kids pulling the weeds. But we children work harder than the grown-ups. They yell at us and threaten us with sticks if we do not work. I would like to see television and movies in our camp. I would like to be able to have another blanket, because it gets cold at night. I would like to be able to read and write so I can write letters to my mother. Oh, she cannot read, but my cousin at the village is in fourth grade, he can read to her. I would like to have a nice scarf, a red one, and a pair of shoes with high heels to look like you".

The Role of Women in the New Lands

2.101 The case of Tahaddi: Unlike other Muslim countries, Egyptian rural women are not confined to their homes. In villages, women are seen in the markets, streets, fields, and around public taps. The rules of modesty require that a woman wears a conservative, long-sleeved dress, often a black long garment, and sometimes covering the face. Only

upper class rural women avoid being seen in public as much as possible. However, all generalizations that are applicable to women's roles in the Old Lands are seldom true of women in the New Lands. Significant differences exist at all levels, e.g. work load, dress, public participation, self images, aspirations etc.

2.102 Varied occupations: It is outside the scope of this feasibility study to provide a comprehensive detailed summary of the role of women in all New Lands projects, but our brief study in Tahaddi provides a clear but rather limited picture of women in these New Lands. In Tahaddi women can be seen as professional doctors, teachers, administrators, and as settlers' wives, farm laborers' wives, and government employees' wives. If we judge by the Tahaddi example, most women in the New Lands, in addition to their household tasks, perform other tasks that take them outside their homes. There are professional women; and most non-professional wives help their husbands either by engaging in agricultural work, marketing eggs, crops, etc., and sometimes work for graduates on their lands for wages.

2.103 Settler's wife: Although most of the settlers' wives tend to initially resent migration to the New Lands, interviews in Tahaddi indicate that women quickly adjust to life in these lands. Not only do they adjust, but they recognize the potential of the New Lands and the opportunities the New Lands offer to them and to their families. The initial resentment was explained by Azzizza who said, "Of course I gave him (her husband) hell when he told me about his intentions to move. I knew I would miss my family, and I knew that I would be all alone with him with no brothers or uncles to back me up when I fight and argue with him. He never involved me in the decision, but he expected me to sell my necklace to have the extra cash. I thought about the necklace a lot, as it was my only security in case he leaves me. Men cannot be trusted. But down deep in my heart I was glad to leave my in-laws behind, especially my mother-in-law's sour-pussed face. He is thinking of inviting her to come and live with us here. Over my dead body. I am the boss now; there is no place for her here anyhow".

2.104 Opportunities: In the New Lands, women see the opportunity to grow and in fact they assume new responsibilities that are traditionally men's responsibilities. During the fieldwork experience in Tahaddi, women asked about plant diseases and techniques of fertilizing crops. In the presence of men, settlers' wives did not hide.

They participated in discussions and were eager to learn new methods that would enhance agricultural yields, dairy products, and improve the quality of their families' lives in general.

2.105 Azzizza is 34 years old and mother of four children. She talked to me while baking bread in a clay-built oven: "I wake at sun-up. I wake my son and the man (her husband). My son, God protect him, is in the fourth grade. I look forward to seeing him become an army officer. I prepare breakfast, feed the children, milk the cows, sweep the floor, and pack to go with my husband to the field. We take my son to school, and continue to the field with the girls. The oldest girl joins us in the fields later because she fills the pots with water from the canal or the water station. We built two rooms on the land. As you see, we have a mud oven here, too. It is easier for me to stay here all day until dusk and then return to the village, than to make that long trip (about 2 km) several times. I work on the land to help the man rid the land of weeds, or whatever needs to be done. Sometimes I help him with the seeding, weeding or harvesting and bagging the peanuts. Oh yes, it is our land. I have to work hard on it. If the man does not need me in the field, I help the girls make dung cakes for fuel. Then I roast a few peanuts for lunch. Sometimes freshly baked bread is served with tomatoes, some greens, or whatever God gives us, we eat. Sometimes I bring along cheese or salt, and we dip the bread in the salt. I fix tea at noon, too. But we continue to work until it is almost dark. I prepare the animals to leave with us for the village. I cook supper, some peas, beans, and, if we are lucky, once a week, beef. We get food aid, flour, oil, and corned beef. We sell the corned beef for cash and buy sugar and tea. My son studies, my husband goes to visit friends. I help the girls comb their hair, clean some rice for the following day's meal or feed the children. I usually go to sleep a little after the asha ^{1/} prayer".

2.106 The settler's wife's work load varies according to number of children who can help her with household chores, and the season. Children above six years help their parents with housework, taking care of younger children, filling pots with water, etc. A farmer's wife's work load increases during the winter and summer harvest seasons. Azzizza harvests the peanuts every summer with her husband. She separates the seeds from the leaves and puts the seeds in bags. In the period between the harvesting and seeding seasons the only agricultural task she performs is to help her husband with weeding.

^{1/} The last of the five daily prayers in Islam.

It usually takes place around 6.30 p.m.

2.107 Azzizza's dreams: Milking the cows and making cheese and butter are her jobs. She feels that she needs to learn more about animals, birds, and plant diseases. Azzizza is a typical settler's wife in the New Lands. She is more active and aggressive than her sisters who live in the Old Lands. But she has been basically liberated from in-laws' pressure; she is a master of her destiny in the New Lands. "My hopes for the future: I would like to have a bigger house, maybe add two rooms, a living room, and a room for visitors. I would like to have a kitchen with a tap in it. I would like to have a color T.V. set. Why not? A few people own T.V. sets here. We only have a transistor radio. I would like to buy some golden ornaments, but all the money has to go to the land for a couple more years. I do not wish to get really rich, because the man might lose his head and get another wife. Too much money is not good for men".

2.108 Liberated women: In South Tahrir, at a state farm established in 1954, settlers' wives compete for local level political positions. In rural Egypt, politics has been traditionally part of a man's world. In the New Lands, women's world is broader and more exciting. It includes running for political office, participating in community development classes, etc. The liberation from extended family pressures, the liberation from stifling in-law pressures, coupled with active participation in economic activities that add to the household budget all opened a new world for the fellaha villager of the New Lands.

2.109 Professional women: In Tahaddi, there are women doctors, teachers, social workers, accountants, and administrators. These are government employees who are appointed to the Tahaddi area. Going to Tahaddi means a higher salary than they would receive in comparable jobs in the Old Lands. But it also means being intellectually isolated from large urban centers. It means that their children will not be able to attend language schools. It means little or no social life.

2.110 Nadia, a 31-year-old teacher, accepted employment in Tahaddi because her husband is an agricultural engineer in Tahaddi. She said, "Life here is boring--no movies--the power is off most of the time. You cannot watch T.V., no books, no magazines. People are too stingy to go to a club and it is too far away (in South Tahrir). The apartment I live in is small for our family of five. I have difficulty finding a maid to take care of the baby, so I stay home. How can I go to work with the baby here alone? It is true our salaries are higher, but things are very expensive in Tahaddi. In my job there are no

rewards. I teach primary school. The children are filthy, and not too bright. They mostly come from poor families so they have lice and ticks. My children have to attend the same school, since it is the only school in the area. They learn the rough language the poor students speak. I see my sister in Cairo with clean children and they all go to language schools. My children will miss out on this. They will have to suffer from the low educational level of this area when we move from here.

2.111 Leaving Tahaddi: Nadia dreams of the day she will leave Tahaddi. She would like to apply for a job in Arabia or some other Arab country. She fantasizes: "Then we can make more money. I would like to buy a car, color T.V. set, save some money for the kids too. Life here is rough, especially when I have to do the housework, cook, and help the children with their homework after a long school day of yelling and screaming at the students".

2.112 People like Nadia who enjoy big urban centers stand to lose a lot by being in a place like Tahaddi.

2.113 Sacrifice and opportunity: Nadia and Azzizza are miles apart from each other. Nadia is the educated, ambitious, frustrated professional woman, and Azzizza is the illiterate, aggressive, optimistic farmer's wife of the New Lands. Tahaddi frustrates Nadia, and excites Azzizza. Azzizza has always worked hard, she is not used to luxury, and Tahaddi offers her a better life, away from the crowded conditions of the Old Lands. In contrast to this, Nadia had to give up a social life, quality education for her children, and an opportunity to live in an urban center like Cairo or Alexandria.

2.114 Contrasts: While living and working in the New Lands, individual females undergo a complete process of personal and social change. Growth patterns vary significantly according to social class. Generally speaking, poorer segments of the population, e.g. settlers' wives and female farm laborers, seem to appreciate the New Lands. The New Lands offer them a better opportunity to increase their incomes and improve their lives. Middle and high class women do not gain anything by living in the New Lands; in fact they stand to lose economically and socially.

2.115 Based on this analysis, one has to raise questions of how to provide incentives for professionals to attract them to work in the New Lands. The low morale of government employees reflects on their job performance.

High frequency absenteeism, poor job performance, apathy are not uncommon to all government employees. Professional females are even less adjusted because they have to play two roles -- the professional, and the housewife in an environment that offers little if no help or rewards.

2.116 Recommendations: Our Tahaddi study indicates that certain changes in the existing infrastructure services are desirable and will help women overcome some problems in the New Lands:

- (a) Satellite villages have the largest population. The present satellite villages in the New Lands have no educational or health facilities. The long walking distance between satellite villages and the central service village, where schools are located, discourages villagers from enrolling their daughters in schools. Hence, our proposed satellite village infrastructure model makes educational and health services available to settlers at their home village.
- (b) In Tahaddi, the existing infrastructure provides a community development unit at the central service village only. Participation in community development classes were low. One reason for the low enrollment is again the distance between satellite villages and the central service village which is sometimes three or four kilometers. For an adult female to take these classes, it means finding transportation. This is often not available, and when available is costly. Our proposed satellite village contains a core building that can be used for community development classes. Administrators of literacy programs could use these buildings for adult education classes.
- (c) The community development units at the headquarters and the central service village ought to have nursery schools. In Tahaddi, there is only one nursery school and that is heavily utilized by government employees' children. Increasing the budgets of these nurseries is important to ensure that they provide incentives for good nannies to continue their employment with the school. The success or failure of these nursery schools often depends on the dedication and personality of the teacher and the nannies.

- (d) Incentive pay based on job performance is necessary to attract professional women to the New Lands. Employees of the New Lands must not feel trapped. They should be the type of people who need a challenge, and at the same time are dedicated. Pay incentives, suitable housing, and training programs ought to attract this calibre of necessary people to the New Lands.
- (e) Having a good telecommunication system is crucial for all New Lands' projects. Women in Tahaddi expressed a concern over the inability to keep in touch with their extended families. They cannot telephone, and mail services are inadequate. In all our proposed models and modules telecommunication services connect the New Lands with the rest of Egypt.
- (f) Agricultural and livestock extension services are very much needed at the satellite village level. Both male and female villagers needed guidance in plant and animal diseases. Our proposed satellite village model provides budgets for these activities. It is hoped that social workers and extension workers can work closely together and plan different types of classes. These classes could be offered at the various community development units at both the central service village level and at the satellite village level.

2.117 Further research is needed to illuminate the following issues:

- (a) impact of increased work load on women's health
- (b) impact of migration to the New Lands on attitudes towards education
- (c) impact of migration family size
- (d) detailed household budgets

A sufficient technical capability component is required to deal with issues related to site selection, water management, production inputs and outputs, etc. Along with this is the necessary human component, which plays a dynamic role in planning, managing and farming reclaimed lands.

Beneficiaries Selection CriteriaExisting Selection Criteria

2.118 Selection criteria for settlers: The success of any land reclamation project depends on the degree of complementarity maintained between two equally important factors, a technical capability and a human capability. A symbiotic relationship between the two components enhances the chances of success of land reclamation projects. This section of the feasibility study focuses only on the human component. A detailed sociological investigation was conducted generally in the reclaimed lands of Egypt, and particularly in Tahaddi, a relatively new project of the Ministry of Land Reclamation (MLR) in Egypt. This investigation was carried out to explore all the dimensions of the human component involvement in the New Lands Reclamation Projects.

2.119 The primary objective of this portion of sociological study is to review and modify the MLR's existing criteria for the selection of both settlers and graduates.

2.120 The findings of the sociological research study in Tahaddi and other reclaimed areas in Egypt will guide all suggestions regarding the modification of the selection criteria, and the rules for setting infrastructure services at the three different levels of socio-cultural integration: satellite villages, central services villages and headquarters towns.

2.121 Selection criteria for settlers: In Tahaddi, the majority of the settlers are serious and hardworking groups of people who take pride in their lands. In spite of the poor quality of infrastructure services offered in the area and the serious water management problem, the settler population is committed to their lands, and they produce relatively higher yields than graduates or state farms, (Table 2.7). However, in Tahaddi, it was noted that the younger settlers were more productive, and more capable of meeting the challenge of the New Lands than the older settlers. Recommendations will be made to modify some of the settlers' selection criteria to reflect our research findings in the New Lands.

2.122 Selection criteria for graduates^{1/}: Our research in Tahaddi indicates that only 30 percent of the graduate population possesses the behavioral and socio-cultural

1/ In this report the word "graduate" refers to an agricultural high school graduate and/or an agricultural university graduate.

attributes necessary for successful farming operations. Many think it is demeaning to work with their hands in the land, and prefer to supervise laborers than to do the work themselves. About 30 percent^{1/} of the graduates lease the land to others and engage in more lucrative economic activities that do not necessitate their living in rural Egypt. In conclusion, the graduates' selection criteria needs to be modified to ensure that certain behavioral and cultural attributes conducive to increasing agricultural production will be included in future selection criteria.

2.123 Existing selection criteria for settlers: The Ministry of Land Reclamation has an elaborate set of criteria for settlers' Muntafi'in selection. Ministerial Decree No.373 of December 11, 1970 (Ref.20), identified the following as major criteria for selecting settlers:

- (a) Egyptian citizenship;
- (b) No police record;
- (c) Not less than 21 years of age, or more than 50 years of age;
- (d) Family size should be not less than three;
- (e) There should be a son at least 17 years of age;
- (f) Farming his main occupation;
- (g) He must agree to reside in the rented land and cultivate it himself;
- (h) He should be a farmer with sufficient ability and experience and should also be capable of paying the deposit;
- (i) He must agree to become a member of the Co-operative Society, should it be established;
- (j) He must accept and implement instructions and orders of EAUDRAL^{2/} given by the authorized staff in the region or sector, and follow the suggested crop rotation;

^{1/} This is an approximation based on verbal statements made by graduates and government employees. It is impossible to get actual figures because of the sensitivity of the issue of the abuses of the graduates' system and government subsidies.

^{2/} Abbreviated from for the Egyptian Authority for Utilization and Development of Reclaimed Lands.

- (k) He, with his family, must not own or rent more than three feddans elsewhere;
- (l) He should pay, in cash, the deposit stated by EAUDRAL at the time of issuing the contract of rent;
- (m) The leased land should not be less than three feddans or more than five feddans; if otherwise, the approval should be obtained from the Minister.

2.124

1970 Law: priorities

- (a) First priority is given to the group consisting of those people from the area surrounding the land to be distributed. This class is divided into the following seven sub-classes:
 - (i) member of the armed forces
 - (ii) families of killed or wounded servicemen
 - (iii) those who have lost, for public purposes, land which they owned in the area to be distributed
 - (iv) farmers from Suez or Ismailia Governorates who were compelled to leave their lands because of military hostilities
 - (v) workers of EAUDRAL and other organizations and authorities responsible to the Ministry of Land Reclamation, on condition that they terminate their services before receiving the land
 - (vi) agricultural laborers who have worked at least 180 days in the area to be distributed
 - (vii) discharged soldiers with certificates of good conduct
- (b) Second priority is given to people from adjacent areas who have worked in the reclaimed area and meet the given criteria.
- (c) Third priority is given to people from densely populated areas as defined by the Ministries of Land Reclamation.

2.125 Modification: 1973 laws: In March of 1973, Decree No. 105 was issued to provide modifications of the 1970 laws. The decree identified ten criteria for selecting settlers:

- (a) Egyptian nationality
- (b) Age between 25 and 50 years
- (c) Clean police record
- (d) Family of at least three members, with a son of working age
- (e) Freedom from physical handicap
- (f) Possession of no more than two feddans of land
- (g) Commitment to relocate to the New Lands, and cultivate the land
- (h) Willingness to join the local agricultural cooperatives
- (i) Agreement to abide by the directives of responsible officials and to follow the prescribed crop rotation

2.126 The two major modifications in the 1973 law change the settlers' age requirements and the size of former land holdings. The 1973 law specifies that only settlers between 25 and 50 years of age can apply. The increase of the minimum age from 21 to 25 years of age sought to ensure that all applicants had finished their military draft periods. The new requirement that applicants can be either owners or tenants of no more than two feddans sought to increase the opportunities for smallholders and landless farmers to acquire a land in the reclaimed areas.

2.127 1973 Law: priorities for selection: An ad hoc committee interviews all applicants and gives priorities to the following groups:

- (a) Demobilized soldiers
- (b) Farmers who lost their land for civil or military projects
- (c) Farmers from Suez and Ismailia Governorates who lost their land because of the war situation
- (d) Workers in government organizations involved in the New Lands projects
- (e) Seasonal workers who worked at least 180 days continuously on land reclamation projects
- (f) Applicants from neighboring localities
- (g) Applicants from overpopulated areas designated by the Governor

2.128 Existing selection criteria for graduates: The existing rules include the following eligibility requirements:

- (a) A graduate from an agricultural high school or university
- (b) Between the ages of 25 and 45
- (c) A minimum of five years of agricultural experience
- (d) An owner of not more than ten feddans
- (e) A non-government employee

2.129 Settlers' selection procedures: The MLR's administrative structure for farm settlements in the New Lands is made up of the following four sections:

- (a) Social Research and Settlement Administration
- (b) Rural Guidance Services and Development Administration
- (c) Follow-up and Evaluation Administration
- (d) Project Management & Marketing Administration

2.130 The Social Research and Settlement Administration is responsible for developing all selection criteria for settlers and graduates. This administration also takes an active part in the selection process. Two government employees in the Settlement Section described the following systems:

- (a) The Settlement Administration is informed of the availability, the size and location of reclaimed lands, and the recommended production units.
- (b) Governors of the governorates where the reclaimed lands are located submit lists of village names from which beneficiaries ought to be selected. Ideally, these villages should have a high population density. In actuality, the Governor selects whichever village he wants to recommend. It is reported that pressure groups, and informal networks play a large role in the process of deciding which villages ought to be included on the list.
- (c) Local government offices in towns near recommended villages advertise a period during which application for land can be made.

- (d) Applications are received and registered in government records.
- (e) Oral interviews are held at the villages of those selected as beneficiaries. An agricultural engineer, the local chief, the village guards, and a representative of local government complete a standard government form for each applicant.
- (f) Application forms are examined and selection criteria are applied. Those who fulfill the MLR's selection criteria are notified and asked to prepare themselves for a given departure date.
- (g) Transportation of settlers is provided at the expense of the governorate.
- (h) In the case of demobilized soldiers, the soldiers apply to the military offices situated in the towns nearest to their villages. A list is compiled of the names of these applicants and it is sent to the settlement section of the MLR where they research cases individually and ensure conformity with government quotas. These quotas require that a certain percentage of reclaimed lands be distributed to demobilized soldiers.

2.131 Graduate selection procedures:

- (a) An advertisement is placed in the local newspapers announcing the geographical location of reclaimed lands. Graduates are allowed to apply for one location only, e.g. if reclaimed lands are available at Nahda and Tahaddi, a graduate can only apply for one area.
- (b) Priority is given to applicants according to the number of years they have spent working for the government on agricultural projects. Each applicant is assigned a grade based on number of years experience.
- (c) A computer program is used to identify highest scoring graduates who are then allocated the best lots in the reclaimed lands.

2.132 Implementation of settlers' selection criteria and the Tahaddi settler population: Although the majority of settlers were brought to Tahaddi in 1967 and 1968, the land was not distributed to settlers until January 1979. Many of the settlers have left the project area, some have

died, and the remaining aged population feels the effect of hard years of poverty and uncertainty. In Tahaddi, settlers were recruited haphazardly. Sometimes false propaganda ^{1/}was used to entice peasants to move to the New Land. In 1968, some of the South Tahrir Province's ^{2/}administrators visited Dakahlia, Munifiya and Beni Suef villages and reported to chiefs and peasants that families who decided to move to Tahaddi would be given a brick house, and 3.3 feddans of land after six months. In 1968, trucks arrived in Tahaddi carrying hopeful settlers. Actual distribution of land to settlers did not take place until eleven years later when the state farm status was relinquished and settlers were given land at Al Ma'rakah. During the eleven years between 1968 and 1979, settlers were obliged to work for low wages on state farms. There seems to be a definite incongruity between the ideal and the actual situation as far as settlers' selection procedures are concerned. This incongruity may be the result of lack of planning and coordination between the various offices within the MLR which handle settlement affairs. An added factor is that different organizations within the Ministry have conflicting interests (Annex F).

2.133 Furthermore, a thorough examination of the MLR selection criteria reveals that some basic behavioral and physical traits which are known to significantly influence economic production are not identified by use of present selection criteria. This is especially true of these criteria used for graduate selection.

2.134 Proposed settlers' selection criteria and implementation: The proposed selection criteria were compiled after the following variables were taken into consideration:

- (a) Absence of negative cultural attitudes to living in the New Lands, at least not at the level of the small landholder population. The idea of owning land, especially for the landless peasants and the small landholders is particularly appealing. There are more applicants than there is land to distribute, so the agencies can afford to be selective.

^{1/} Peasants were shown extra large watermelons and corn and were told that these were grown on sandy soil similar to the Tahaddi land. However, it appears that the watermelons and the corn were bought from a Delta market and were produced in Delta land.

^{2/} These are governorates in both Upper and Lower Egypt.

- (b) Massive institutional changes favorable to creating a more efficient system of beneficiary selection will not occur in Egypt's bureaucracy overnight. Therefore, the system proposed here effects a tightening of the existing selection criteria. It assumes minimum improvement in coordinating the various administrations dealing with settlements.

2.135 Desirable physical characteristics and attitudes: In Egypt it is difficult to use a set of uniform criteria for recruiting settlers for all land reclamation projects. Reclaimed lands have different types of soils, climates and irrigation systems. Consequently, each project requires people with different skills and attitudes. The population pool from which settlers are drawn is quite diverse in cultural backgrounds, e.g. peasants (Upper Egypt, Lower Egypt), Bedouins and agricultural university graduates. However, there seems to be a number of both physical qualities and mental attitudes identified which are conducive to obtaining high productivity in the New Lands. These qualities are:

- (a) physical strength - life in the New Lands represents a physical challenge to individuals. This challenge requires hard physical labor that a schistosomiasis ^{1/} ridden 40-year-old person would normally not be able to handle.
- (b) openness to innovative ideas (new irrigation methods, new crops, new cultivation methods).
- (c) a high level of agricultural skills, knowledge of and a true commitment to the land.
- (d) a positive attitude toward authority, and a willingness to participate in community development efforts.

2.136 It should be noted that the recommended age is 25 - 40 and not 50 years which is the existing norm. It was noted that in Tahaddi younger settlers are better able to meet the physical challenge posed by living in the new reclaimed lands. This change in the age selection criteria enhances the possibility that one owner will cultivate the land until a reasonable level of productivity is reached.

^{1/} A debilitating disease caused by contact with micro-organisms present in the water to which Egyptian farm workers are constantly exposed.

2.137 Family size and labor requirements: The recommended size of production unit (five feddans) requires the labor of two man-years equivalent per year. A man and his wife, with the part-time assistance of a child, can meet the labor requirements of the land.

Proposed Selection Criteria

2.138 Stage one--applications from settlers: Applications can be received from individuals meeting the following criteria:

- (a) Egyptian citizens
- (b) individuals with no police record
- (c) applicants should not be younger than 25 years of age, and not older than 40 years
- (d) applicants should have a family consisting of no less than three individuals
- (e) applicants should agree to relocate to project sites
- (f) applicants should have a minimum of five years agricultural experience
- (g) applicants should be in good physical condition
- (h) applicants should be owners of not more than two feddans
- (i) applicants should agree to join an agricultural cooperative, and any other cooperative that is related to production and irrigation
- (j) applicants should agree to use crop-rotation patterns set for the project

The main objective behind modifying the existing set of criteria is to bring to the New Lands the most industrious, energetic, and needy elements of the population who will see, in the New Lands, an opportunity to make a better life for themselves and their families. Such individuals can easily be found in the highly crowded villages of Egypt. Selection criteria should reflect a concern for finding:

- (a) individuals who will provide optimum utilization of the land
- (b) individuals who will adjust to life in the New Lands

2.139 Applications and verification of information on applications: This stage strives to achieve the following:

- (a) cross-checking information provided by applicants
- (b) ensuring that applicants have the personal qualities conducive to production

It is recommended that a verification committee be formed to include the following people:

- (a) a social worker
- (b) an agronomist
- (c) the local chief and/or a respected local leader

2.140 Screening: The committee will go through information provided on the original application with the applicant to verify the extent of the accuracy of the information. A set of questions will have to be developed to determine:

- (a) agricultural skills and ability to grow suggested crops for the project (agronomist's role)
- (b) personality traits and attitudes, for example industriousness, openness to accepting innovations in irrigation and cultivation methods, general attitudes toward authority and community participation (local chief and social workers' roles)

2.141 The committee should assign ten points to each of the above mentioned criteria. The highest scoring applicants should be the candidates for land grants in the New Lands.

Sociological Considerations in Settlers' Recruitment

2.142 Ethnicity: Our study of Tahaddi indicates that in Egypt's New Lands, individuals form informal networks based on ethnic origin (governorates of origin and sometimes villages of origin), e.g. in Tahaddi, people from Munifiya have a local leader whom they trust and from whom they seek advice on economic and social problems. These informal networks are extremely helpful in extending moral and financial support to individuals who have left their familiar worlds in the Old Lands.

2.143 Migration to the New Lands involves adjustments to a new physical and social environment. Ethnic informal networks minimize the negative effects of migration. It is highly recommended that selection criteria should not break ethnic boundaries. In other words, groups should be selected from the same or neighboring villages. This would help to ensure that informal ethnic networks remained and continued to provide support and encouragement for new settlers.

2.144 Entrepreneurs among settlers: Settler villages need traders, midwives, barbers, butchers, carpenters, etc. Applicants with such skills should be given priority to own land.

2.145 Recommended recruitment strategies: The recruiting committees should interview applicants at a local leader's house. The informal setting, and the fact that questions are answered in front of a respected leader, minimizes the opportunity for the applicants to falsify information or embellish the truth. All applicants should be told the exact date when names of successful candidates will be announced. The committee should have enough information about the project to enable it to answer applicants' questions.

2.146 Residence proximity to the project area: It is recommended that settlers be recruited from neighboring villages where the reclaimed land is located. One advantage of recruiting from nearby villages is that it allows settlers to continue their social ties with their extended families and with their villages of origin. Moreover, when applicants are drawn from a neighboring village, this generally means that minimum adjustment to the new environment is required. However, this criteria should not be interpreted to mean an exclusion of settlers from areas more distant from the project area.

Proposed Application Criteria for Graduates

2.147 Stage one--applicants: Applications could be received from the following two groups:

- (a) agricultural university graduates who have had three years of previous experience working in the Old Lands, or in the reclaimed lands in Egypt
- (b) agricultural secondary school graduates who have had three years of previous experience working in the Old Lands, or in the reclaimed lands

These applicants should have the initial investment and should be in good physical condition.

2.148 It is recommended that new graduates be excluded in favor of more experienced and socially mature individuals who will, perhaps, appreciate the challenge of living in the New Lands.

2.149 Stage two--selection: A committee including the following people will be formed:

- (a) a senior MLR representative
- (b) an agricultural specialist
- (c) a senior professor in sociology

2.150 The committee will request recommendation letters from immediate supervisors of the applicants. The committee will ask questions concerning:

- (a) the reasons for wanting to own reclaimed lands (10 points)
- (b) previous agricultural experience (verified by a letter of recommendation) (10 points)
- (c) knowledge of farming operations in reclaimed lands (10 points)
- (d) willingness to move to and live in the reclaimed lands (20 points)
- (e) willingness to invest private funds in the reclaimed lands (10 points)
- (f) access to hiring of farm labor (40 points)

Training for Settlers and Graduates

2.151 It is recommended that all settlers be trained in the following areas:

- (a) handling irrigation systems and ways of procuring spare parts for such systems
- (b) handling sandy soils and the recommended crop rotations
- (c) credit available to smallholders
- (d) using agricultural co-ops in the New Lands
- (e) farm machinery
- (f) procedures of local government
- (g) community participation and social infrastructure services

Settlers' wives should receive training in the following areas:

- (a) basic hygiene
- (b) birth control devices and their availability in satellite villages of the New Lands
- (c) use of social and medical infrastructural services

2.152 Training seminars for graduates and their wives: It is also recommended that graduates and their wives participate in a series of seminars before starting work on their lands. Seminars can be held in the Mariut Research Center or other similar institution. Graduates will spend three weeks together learning about the following:

- (a) types of soils and recommended crop rotations
- (b) agricultural co-op organizations
- (c) graduate's credit system
- (d) small-farm operations (farm animals, poultry, etc.)
- (e) operation and maintenance of farm machinery

(f) marketing

(g) community participation

2.153 Graduates' wives will attend the above mentioned sessions. Wives should also attend a special program for discussions on the following topics:

(a) the home economics of a small farm

(b) dairy and poultry operations on a small farm

(c) household budget and expenditures

(d) community participation

2.154 The graduates' training program should emphasize that the graduates' role is not only to supervise labor, but actually to work on the land. Graduates are farmers and not farm managers.

2.155 During the three week seminar, graduates and their wives should be given opportunities to socialize and become acquainted with their prospective neighbors. Evening sessions should be short to allow for informal interactions between group members at the conclusion of each session.

Social Infrastructure Services

Existing Social Infrastructure Norms for the MLR

2.156 The following table represents the existing norms followed by the MLR when distribution of infrastructure services (Ref.21) are being considered:

Housing

Farmer's type	1 per 10 feddans
Farm laborers' type	58 per 5000 feddans
Agronomists/assistants	52 per 5000 feddans
Farm manager	1 per 5000 feddans
Director-general	1 per sector
Deputy DG/zone director	1 per 10,000 feddans
Guest houses	1 per 10,000 feddans
Official clubs	1 per 10,000 feddans
Apartment blocks	1 per 1000 feddans
Migratory laborers' camps	1 per 10,000 feddans

Social Services

Community development unit	1 per 5000 feddans
Social unit	1 per 25,000 feddans
Social affairs zone	1 per sector

Health Services

Rural branch health unit	1 per 5000 feddans
Rural combined unit	1 per 20,000 feddans
Central hospital	1 per sector

Educational Services

Primary school	1 per 5000 feddans
Preparatory school	1 per 10,000 feddans
Secondary school	1 per sector

Cooperatives

Agricultural co-ops	1 per 1250 feddans
Consumer co-op	1 per sector

Public Utilities

Mill	1 per 20,000 feddans
Bakery	1 per 10,000 feddans
Post/telegraph/telephone offices	1 per 10,000 feddans
Police/fire stations	1 per sector
Mosques	1 per 5000 feddans
Cemeteries	Self-help projects will fund and build cemeteries.

2.157 The existing norms are primarily based on the number of feddans reclaimed and not on the number of utilizers. The existing norms ignore both the size and the nature of the beneficiary population. The reason for basing infrastructure services on the number of feddans reclaimed is that there is a wide gap between policies implemented by the ministry's technical administration, and those implemented by the settlement administration. For example, land is reclaimed and facilities installed, before information on the number of settlers is known, by either the technical administration, or it seems, the settlement administration. In most cases, as in Tahaddi, the number of the population far exceeds the number of available houses and the designed capacity of power stations. Beneficiary's utilization patterns are often ignored as a result of this lack of co-ordination.

2.158 Another equally important issue which influences the distribution of infrastructure services is that, in some cases, a sector like South Tahrir is split into two

or more sectors. Tahaddi was part of South Tahrir until a year ago, when it became administratively independent from the South Tahrir Company. This separation left Tahaddi with no secondary schools, no hospitals, no mills, etc. The distance between Badr, the central town of South Tahrir and parts of Tahaddi can be as many as 20 or 25 km.

2.159 Housing in the New Lands: Both ownership of land, and housing are the two main incentives for farmers to leave the Old Lands and venture into the unknown desert.

2.160 Core housing is an acceptable idea to both settlers, and government officials, provided that a core house is built with the following constraints in mind:

- (a) a settler cannot afford to add rooms to his house for at least three years. A large portion of the income of the first two years goes back to the land in the form of manure, labor, top soil, etc.;
- (b) bricks and cement are favored for building materials rather than local materials;
- (c) potable water, electricity, irrigation water, are desired by all settlers;
- (d) a large lot allows a settler to add more rooms as his need for more space increases and as finances permit;
- (e) a fence is desired as it provides privacy to the settlers' family; and
- (f) enclosed bathrooms were favored by settlers who argued that during the cold winter nights it is not practical to leave a warm bedroom to use the bathrooms, hence children tend to urinate in the bedrooms as they try to avoid leaving their warm rooms.

2.161 Settlements and social infrastructure in Tahaddi:

- (a) satellite village models:
 - (i) average of 130 settler type homes (two bedrooms and a latrine)
 - (ii) homes are wired for electric power
 - (iii) public faucets for potable water

- (iv) one agricultural co-op building
- (b) central service village models:^{1/}
 - (i) average of 250 settler-type homes
 - (ii) average of ten middle management type villas
 - (iii) one elementary school
 - (iv) one nursery school
 - (v) one health unit
 - (vi) one community development unit
 - (vii) agricultural co-op
 - (viii) shops
 - (ix) water tank and electricity
 - (x) handicrafts
 - (xi) youth club
 - (xii) transport (bus and/or taxi)
 - (xiii) mosque and Koran center
 - (xiv) family planning center
- (c) headquarters town (Al Nagah)
 - (i) 251 settler-type homes
 - (ii) 27 middle-and high-management homes
 - (iii) two apartment buildings (total 16 apts.)
 - (iv) one elementary, one preparatory and one nursery school
 - (v) police/fire stations
 - (vi) mail/telephone room
 - (vii) combined health unit
 - (viii) bakery
 - (ix) one farm laborers' camp (another one at a central service village)
 - (x) community development unit
also same as central service village as above from (vii) to (xiv)

^{1/} Al Tall Al Kabir and Al Faluga are exceptions both of which have practically no infrastructure services.

2.162 Housing and village layout in Tahaddi: There are 17 villages in Tahaddi. In each of the seven farm sectors there is one main service village and two or three surrounding villages (ezbas) ^{1/}. On the average there are 225 houses in each major village (service village), and about 130 houses in the satellite (ezba) villages.

2.163 Houses are provided free of charge for all government employees. The style of the house, and the number of rooms vary according to the employees' rank. The director of Tahaddi receives a two-story villa that consists of four closed rooms, a living room, and a bathroom. Smaller villas are given to less senior government employees. In Al Nagah there are two four-story apartments for middle-range managers. The following is a chart that shows the number of housing units in both the work villages and satellite villages of Tahaddi.

<u>Village</u>	<u>Number of Units</u>	<u>Type of Housing Units</u>
<u>Service Village</u>		
Al Nagah	251	Settlers homes
	1	Villa for farm manager (Type H20) ^{1/}
	8	Villas for farm managers (Type H13)
	16	Villas for middle managers (Type H19)
	2	Apartment buildings (four story, 8 unit)
	2	Labor camps
	1	Labor camp restaurant
	2	Two-story villas for the director and the deputy director of Tahaddi
<u>Satellite Villages</u>		
"29"	80	Settlers' homes
Mirtah	116	" "
"30"	92	" "
<u>Service Village</u>		
Al Faluga	188	Settlers' homes
	1	Villa (Type H13)
	4	" (Type A46)
	2	" (Type A34)
<u>Satellite Villages</u>		
"A"	60	Settlers' homes)inhabited
"B"	116	" ")by the)Sinai migrants

^{1/} All definitions of house or villa types may be found in the ULG Report (Ref. 10).

<u>Village</u>	<u>Number of Units</u>	<u>Type of Housing Units</u>
<u>Service Village</u>		
Al Tall Al Kabir	192	Settlers' homes
	4	Villa (Type A46)
	2	" (Type A34)
<u>Satellite Villages</u>		
"A"	120	Settlers' homes
"B"	120	" "
"C"	120	" "
<u>Service Village</u>		
Al Azimah	188	Settlers' homes
	1	Villa (Type H13)
	2	" (Type H19)
	4	" (Type H46)
	2	" (Type H34)
	2	Farm laborers' camp
<u>Satellite Villages</u>		
"Al Muntafeyn" 1/	120	Settlers' homes
"Al Muhagreyn" 2/	124	" "
<u>Service Village</u>		
Al Kifah	236	Settlers' homes
	8	Villa (Type A46)
	2	" (Type H13)
	4	" (Type H11)
	4	" (Type A34)
	5	Villas (wooden structure, 4 closed rooms)
	1	Type (H20) 30 closed rooms
<u>Satellite Villages</u>		
"20"	72	Settlers' homes
"Al Muntafeyn"	116	" "
"Al Muhagreyn"	108	" "
<u>Service Village</u>		
Al Ma'raka	240	Settlers' homes
	1	Villa (Type H13)
	2	" (Type H19)
	4	" (Type A46)
	5	" (Type A34)

1/ The word "Muntafeyn" means beneficiaries and in this context is specifically refers to settlers.

2/ The word "Muhagreyn" refers to immigrants.

<u>Village</u>	<u>Number of Units</u>	<u>Type of Housing Units</u>
<u>Satellite Villages</u>		
"3"	144	Settlers' homes
"Sifna"	113	" "
"As'saidda"	128	" "
<u>Service Village</u>		
"Ayn Galut"	212	Settlers' homes
	1	Villa (Type H13)
	4	" (Type A46)
	2	" (Type A34)
<u>Satellite Villages</u>		
"34"	112	Settlers' homes
"37"	96	" "

2.164 The previous chart illustrates a high level of understanding of the various housing needs of the different socio-economic groups, yet in reality there are tremendous housing problems. Some of these problems can be summarized as follows:

- (a) The number of government employees increased to a point where there were more eligible employees than there were homes available in the area. Hence, it became a common practice for government employees to live in settlers' homes. Two related problems resulted: (i) it deprived settlers of homes that were built initially for their use; and (ii) it provided government employees with inadequate housing units which were not built for this particular socio-economic group. This situation led to the ultimate dissatisfaction of both settlers and government employees.
- (b) Immigrants from the Suez Canal and the Sinai Desert were brought to Tahaddi and housed in settlers' homes. Settlers' had to suffer the consequences of crowding.
- (c) Although graduates are given a LE 4800 loan to build their own houses, they find it convenient to use the settlers' houses until building materials and further money are available to build their own homes.

- (d) Houses designated for settlers are occupied by immigrants and even graduates. This means settlers cannot find housing in Tahaddi.
- (e) Homes occupied by immigrants are sadly neglected. Doors and fences are missing, and some walls have been dismantled and the bricks sold. To distribute these homes to settlers without repairs and maintenance causes serious problems. A settler complained that he had received a home without doors and could not buy doors himself.

2.165 In Tahaddi housing is a constant source of complaint. As one settler put it, "They have built us tombs, not homes". Fourplexes^{1/} are small. Two rooms, an animal shed and a bathroom is the common housing pattern in Tahaddi.

2.166 Some of the problems of the existing core houses in Tahaddi are as follows:

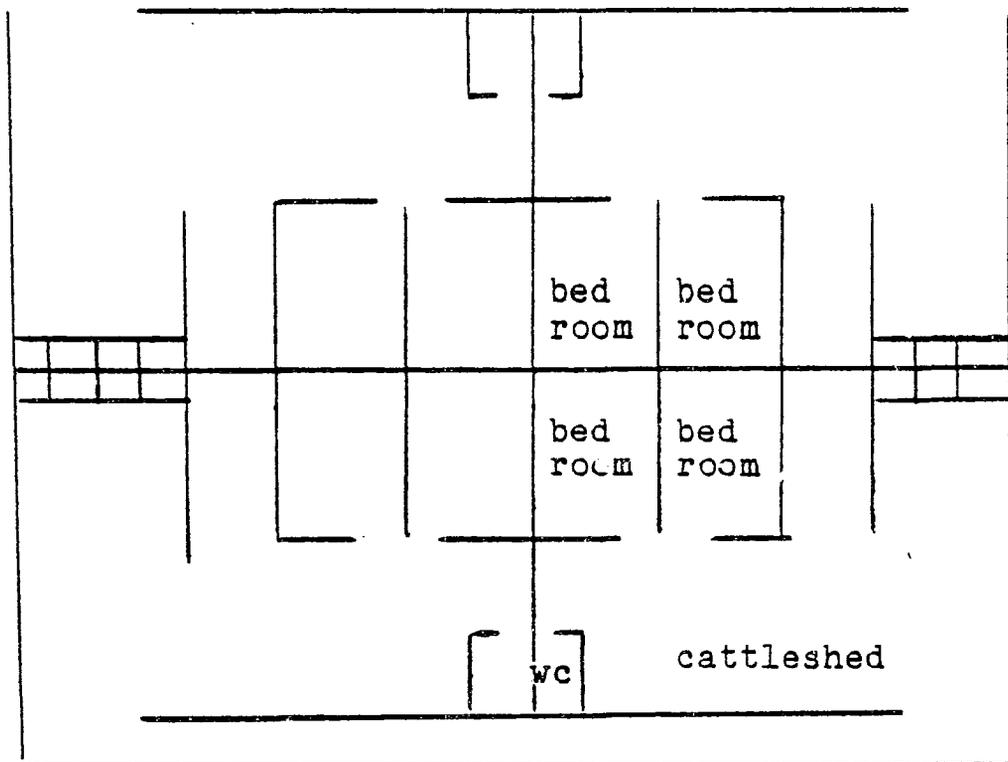
- (a) no windows (only a hole in the ceiling, and a small window in the door that has to be sealed for privacy)
- (b) small rooms and small lots where expansion becomes very difficult
- (c) bathrooms are not attached to the bedrooms; during the cold winter nights one must leave the warm bedroom to walk to the bathroom
- (d) crowding; new settlers' families join existing settlers, due to a lack of available housing
- (e) faulty electric wiring has caused a number of fires
- (f) existing homes have a hole in the ceiling; this hole makes the bedrooms uncomfortable on rainy days and also allows rats to roam the house
- (g) no proper ventilation as the only sources of fresh air are the ceiling hole and the bedroom doors

^{1/} This is the technical name given to accommodation consisting of four living units.

- (h) improper lighting--the rooms have no windows and usually are without electricity. Because of the frequency of blackouts, settlers use kerosene lamps which are not only fire hazards, but are unhealthy in the absence of adequate ventilation.
- (i) poorly constructed roofs which have caused several accidental deaths. Egyptian peasants are accustomed to storing corn stalks for fuel on the roofs of their homes, making a trip to the roof necessary for procuring fuel for cooking. Recently a woman died as a result of the roof collapsing. The roofs are not suited for second story additions.

2.167 The following diagram (Figure 3) shows the plans used for building Tahaddi's fourplexes:

Figure 3 Settlers' Fourplex Plans



2.168 The existing fourplex structure does not provide settlers with any privacy, fences are too low and the addition of half a meter of a mud-built fence, as is sometimes done, does not help, as it gets washed away during the winter rains and becomes a hazard during the kamaseen (50 days of windy weather, May-June).

2.169 Graduates' housing and infrastructure facilities: Each graduate receives a loan of LE 4800 to build a house for himself and for one farm laborer. Graduates are required to build their homes on their agricultural lands.

2.170 The sociological survey indicates that 84.38 percent of the interviewed population have actually completed their homes. The typical graduate house consists of the following:

- (a) three bedrooms
- (b) living room (sala)
- (c) bathroom and shower
- (d) kitchen

2.171 Although all graduates want electricity and potable water, the cost of installing such services is quite prohibitive because of the distance, therefore, very few of the houses have these amenities.

2.172 Many graduates continue to live in villas that were assigned to them as government employees.

2.173 Nagah has 251 settler homes that are presently occupied by government employees. The homes are not adequate for government employees and many are forced into a situation of commuting to Cairo or Damanhur where their families live. In response to the question, "Why does your family not live with you in Tahaddi?" the answers included the following:

- (a) "Originally lived in South Tahrir"
- (b) "Expensive in Tahaddi"
- (c) "Lack of infrastructure"
- (d) "Life is hard"
- (e) "Relatives live in the Old Lands"
- (f) "Poor quality water, poor educational facilities"
- (g) "Lack of adequate housing"

- (h) "No hospital"
- (i) "High costs of living"
- (j) "No dependable consumer co-op"
- (k) "Few shops in the private sector"
- (l) "No water in the houses"
- (m) "Frequent power shut-offs"
- (n) "Lack of recreational facilities"
- (o) "No language schools"
- (p) "Secondary schools are far from Nagah"
- (q) "No day-care centers"
- (r) "Lack of price control"

One can conclude that the most crucial problems facing government employees in Tahaddi are related to inadequate infrastructure services, e.g. water supply, water quality, frequent power shut-offs, inflation, low salaries, poor quality educational systems. It follows that the higher placed the government employees are the more likely it is that their families prefer to reside in large urban centers.

2.174 Observations and comments on housing and social infrastructure services in Tahaddi: Tahaddi has the following social infrastructure services:

- (a) There are 797 government employees working for the Tahaddi sector in Nagah, but there are only 43 available housing units for these employees and their families. Consequently, government employees are forced to live in settlement type homes that are not usually suitable for this socio-economic class.
- (b) Operating budgets are too small or non-existent to allow for social programs and community development projects to be sustained in the area.
- (c) All clinics suffer from low medicine allocations, a situation which reflects negatively on utilization patterns. The lack of a hospital and a maternity ward is of great concern to the people of Tahaddi.
- (d) The irregular bus schedule forces many people to use private taxis. These taxis charge fees which are often beyond the meager resources of settlers.

- (e) There is little road maintenance.
- (f) The nearest secondary school is in Badr, South Tahrir, about 60 km from Ma'rakah. Crowding in schools (55 pupils per class) was reported.
- (g) Public faucets are shut off in most satellite villages; people are forced to get water from the local canal or from the sprinkler irrigation system, a practice which causes many health problems.

2.175 In sum, Tahaddi has social infrastructure facilities which render poor quality services. There are two major reasons for this:

- (a) institutional and organizational problems and
- (b) job performance failure of some government employees

2.176 The institutional and organizational problems include lack of clearly defined functions; overlapping responsibilities; over-staffing; lack of, or very small, maintenance operating budgets; inadequate supplies (spare parts, medicine, etc.); and no communications with the local government system of Egypt.

2.177 Although all MLR employees receive a 40 percent cost-of-living allowance in addition to their basic salaries, most government employees are forced to supplement their small salaries to meet the financial demands of their large families (family size of five). The base salary for a university graduate government employee is LE 25.00 per month. To supplement this meager income, one has to either engage in a commercial venture, or accept a second job.

2.178 This sociological survey focused on the quality of the services offered to beneficiaries. The following two tables show the results of the survey.

Proposed Parameters for Setting Social Infrastructure Services

2.179 When planning infrastructure services, the following variables ought to be taken into consideration in determining the type and number of social infrastructure services:

Graduates' Evaluation of Infrastructure Services in Tahaddi

	<u>Very Good</u>		<u>Good</u>		<u>Poor</u>		<u>Not Utilized</u>		<u>Total</u>	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agricultural co-op	25	39.06	30	46.88	9	14.06	-	-	64	100.00
Potable water	1	1.56	2	3.13	37	57.81	24	37.50	64	100.00
Electric power	1	1.56	4	6.25	35	54.69	24	37.50	64	100.00
Educational services	-	-	3	4.69	45	70.31	16	25.00	64	100.00
Transportation	2	3.13	11	17.19	51	79.69	-	-	64	100.00
Roads	-	-	8	12.50	56	87.50	-	-	64	100.00
Health services	1	1.56	2	3.12	61	95.31	-	-	64	100.00

Settlers' Evaluation of Infrastructure Services in Tahaddi

	<u>Very Good</u>		<u>Good</u>		<u>Poor</u>		<u>Not Utilized</u>		<u>Total</u>	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agricultural co-op	22	14.67	109	72.67	19	12.67	-	-	150	100.00
Potable water	-	-	42	29.17	-	-	102	70.83	144	100.00
Electric power	-	-	54	37.24	91	62.76	-	-	145	100.00
Schools	-	-	73	63.48	35	30.43	7	6.09	115	100.00
Health units	-	-	11	9.09	105	86.78	6	4.13	122	100.00
Roads	-	-	5	3.45	140	96.55	-	-	145	100.00
Mail/telephone service	-	-	1	7.69	129	99.23	-	-	130	100.00
Club	-	-	-	-	-	-	114	100.00	114	100.00
Transportation	1	0.70	15	10.56	121	85.21	5	3.52	142	100.00

- (a) size of population
- (b) nature of beneficiary population
- (c) utilization patterns

In other words, one has to ask:

- (a) how many people are expected to use the services?
- (b) who uses the services?
- (c) how do they use them?

In the New Lands, we deal with two distinct socio-economic groups:

- (a) settlers, farm-laborers, and subordinate government staff; and
- (b) middle and top management personnel, and agricultural university graduates.

2.180 These two groups have different social expectations. Social infrastructure services have to reflect an understanding of these socio-cultural differences between the two groups (Annex C).

2.181 The proposed settlers' model and graduates' model for infrastructure services assumes the following conditions:

- (a) There will be coordination between the Settlement Administration personnel in the MLR and Technical Administration personnel engaged in the process of land reclamation.
- (b) Settlers will all arrive to find minimum social infrastructure services available to meet their housing, educational and health needs.

2.182 Proposed settlers' model: satellite villages, central services villages and headquarters town:

- (a) consists of five modules (6000 feddans)
- (b) each module has five satellite villages, and a central service village
- (c) each model will include a headquarters town.

2.183 Satellite villages, ezbas, are communities that will consist of 200 settlers, and a support staff of 37 government officials (Annex C). The maximum walking distance between field and house will be 1.5 km. Anticipated village population will be 1410.

2.184 Housing: Upon arrival all settlers will have red-brick core houses available to them which will have both potable water and power. This sociological survey indicates that red bricks are referred by settlers over all other building materials. All settlers desired water and power to be connected to their homes.

2.185 The two-bedroom core houses will provide shelter for a family of six. A pit latrine and a large-sized lot, 500 sq m, will be provided to allow for future horizontal expansion.

2.186 Each settler will pay for the house over a period of 20 years. Settlers will be given a grace period of three years to adjust to the practice of paying regular sums as loan payments. By paying for their own homes, settlers will experience a sense of pride-of-ownership of real estate, paid for through the efforts of their own labor and not received free of charge. Settler-type homes will be provided for co-op subordinate staff, and agricultural co-operative staff members and the village Imam will be given rent-free type B² houses (Annex C).

2.187 Free house lots will be distributed to members of the private commercial sector who desire to live and do business in the village.

2.188 Educational services: The present norms for establishing schools in Egypt are:

one primary school	per 2,500 persons
one preparatory school	per 10,000 persons
one secondary school	per 30,000 persons

2.189 This sociological research indicates that settler families arrive in the New Lands with an average of four children, but only half of these children ever attend school. Some children may never have attended school and are considered too old to do so. Some girls are considered old girls^{1/}, and their parents prefer not to send them to school, however, this does not mean that all girls do not go to school.

2.190 In Tahaddi there is a 50 percent drop-out rate among primary school children. There is also a 50 percent drop-out rate among preparatory and secondary school children. Some of the reasons for these high drop-out rates are as follows:

^{1/} In some areas of Egypt, an "old girl" can be eight to fourteen years of age.

- (a) the expense of school uniforms
- (b) the expense of transportation to schools
- (c) children who go to school do not earn money; instead they become burdens requiring a financial investment, as opposed to contributing to financial assistance of the family.

2.191 Primary school education is obligatory in Egypt, although the laws are seldom enforced. Ideally, legal sanction should be brought against parents who do not send their children to school.

2.192 In this model, a primary school of six classes (40 students per class) is proposed to serve every second satellite village. The school will operate on the basis of two shifts. The maximum anticipated walking distance between the two villages is about two km. Children will not need transportation; furthermore, they can go to primary school and work four or five hours a day (if this financial contribution to the family's income is necessary). Bringing primary school education to satellite villages eliminates the need for transportation, and makes it possible for children to combine school and work at the same time.

2.193 Health services: The norms for the provision of medical health services are as follows:

- (a) A branch clinic is recommended for each minimum population of 1000, i.e. for one small settler village, with visits by a doctor from the nearest health unit twice weekly. One attendant should serve the clinic full time. Tahaddi does not have branch clinics.
- (b) A rural health unit should be provided for populations of from 5000 to 10,000 persons, staffed by a doctor, nurses, a midwife and assistants. There may be accomodation for a medical clinic, and in some cases a dental clinic. All central service villages in Tahaddi include a rural health unit.
- (c) Rural hospitals are needed in larger villages. A hospital would provide some of the same services as the health unit, with the addition of an operating theater and some beds. There is no hospital in Tahaddi.

2.194 In this model, it is proposed that a branch health clinic will operate in satellite villages once a week. The branch health unit will be staffed by a visiting doctor and a nurse/midwife. Both should receive incentive pay based on services rendered to settlers. The branch health unit should have a supply of birth control pills to be sold at a normal price in the village.

2.195 It is hoped that some of the USAID funded projects for training midwives can be implemented in New Land communities.

2.196 Telephone and mail services: A single line telephone will be provided to the house of the local chief or some distinguished leader.

2.197 A budget will be allocated for hiring a mail distributor for each village. A bicycle will be made available to the distributor to facilitate his task.

2.198 Community development core building: A three-room structure will be provided as a core community development unit that can be expanded as the need arises. These three rooms can be used for:

- (a) community meetings
- (b) literacy classes
- (c) classes in sewing, knitting, carpet-making, etc.
- (d) storage of fire equipment
- (e) recreational activities, e.g. soccer in the yard

The operating budget for this unit, and the cost of maintaining the building will depend entirely upon community contributions.

2.199 Roads: A paved road would connect the satellite villages with each other and with the service village.

2.200 The private sector in the satellite villages: Private shops, located in the satellite village, will meet the settlers needs for tea, coffee, sugar, cigarettes, etc. To encourage the private sector to move to satellite villages, a land lot will be offered, free of charge, to the members of the private commercial sector who are willing to live and do business in the village.

2.201 Cemetery and religious institutions: Land will be allocated for self-help projects. This would enable settlers to build a cemetery and religious institution.

2.202 A central service village will be established for every five satellite villages. The central service village will be the place to (a) house middle management government employees, and (b) provide higher level services for satellite village populations. The central service village will have the following population:

- (a) 200 settler families
- (b) support staff
- (c) about 20 private commercial sector people.

For figures see Annex C.

2.203 Housing: Central services villages will include the following types of housing:

- (a) 200 settler-type homes as described in the satellite village module;
- (b) a three-room apartment in a four-story, eight-unit building will be provided free of charge for government employees as long as they continue to work in the area;
- (c) B² type homes for subordinate staff (see Annex C);
- (d) house lots will be given free of charge to private commercial sector people.

2.204 Educational services: A primary school of the same size recommended for satellite villages will be built, this will serve one satellite village as well as the central service village.

2.205 Twelve preparatory school classrooms will be included. The preparatory school is expected to operate on the basis of two shifts.

2.206 A rural health unit will fulfill the following functions: (preventative and curative medicine)

- (a) birth and death registration
- (b) school health
- (c) curative functions
- (d) dispensing medicine
- (e) immunization
- (f) environment health
- (g) family planning
- (h) collecting health data

2.207 Staffing will consist of two doctors, five nurse/midwives and two tamargias (attendants). The two doctors will be on duty on alternate days in the mobile health unit. The doctor travelling with the unit will receive incentive pay based on the number of patients seen, and the number of seminars on preventive medicine conducted at the satellite village level with settlers' wives.

2.208 Doctors should not be assigned to the New Lands against their will. There should be a voluntary medical program that provides special incentives to doctors who want to serve in the New Lands. Some of the incentives can be in the form of:

- (a) free housing
- (b) higher pay (incentive pay based on services rendered)
- (c) having sufficient medicine allocations available
- (d) periodic training sessions to be offered in Cairo or Alexandria. These should be both informative and recreational. The aim is to allay the fears of ambitious and efficient doctors regarding possible cultural and scientific isolation due to employment in remote parts of the country. It is also hoped that a training program for local dayas (midwives) (one of the several proposed USAID projects) will find its way to the New Lands. This will train at least one female community member to inform neighbors and friends of basic rules of hygiene.

2.209 Community development unit with a nursery school:
A community development building will consist of:

- (a) four activity rooms (one for use as a nursery school)
- (b) two offices (for the social worker and teaching staff)
- (c) a courtyard large enough to have a playing area for nursery school children
- (d) one storage room (film equipment, toys, etc.)

2.210 Staffing: The community development unit will be staffed by two social workers (MLR), one nursery school teacher, two part-time community classes teachers, two dadas (nannies) for the nursery school, and two custodians.

2.211 Functions:

- (a) it is the responsibility of the social worker with community leaders, to plan social programs needed by the inhabitants of the area;

- (b) provision of classes in sewing, knitting, carpet making, basic hygiene, home economics, etc., can be offered if the community deems it necessary; and
- (c) provisions of nursery school facilities for children three to six years of age.

2.212 Fire stations: Basic fire fighting equipment including a jeep equipped to handle small fires will be provided. This equipment would be kept in a small shelter allocated for the purpose.

2.213 Agricultural co-op: An administrative and storage building will be provided for agricultural co-operative activities.

2.214 Food program: An administrative and storage building will be provided for the distribution of food allocations to settlers in the first three years of settlement.

2.215 Consumer co-op: A small building will be provided to serve as a consumer co-op. This consumer co-op is important because it makes necessary goods available to the employees living in the area. It also provides competition to the private sector who will then be more inclined to charge reasonable prices.

2.216 Self-help projects: Cemeteries and religious institutions will be provided by community financial efforts.

2.217 Private commercial sector: A free land lot will be given to active members of the private sector who are conducting business and own shops in the central service village. The private sector is expected to open grocery shops, butcher shops, coffee houses, carpentry and plumber shops, etc.

2.218 Headquarters town: The headquarters town will house management and professional level personnel who will provide the technical assistance needed for operating the project.

2.219 Housing:

- (a) a majority of employees will be housed in apartments. Rent will be free as long as they remain active employees of the project.

- (b) only directors and deputy directors will be given villas.
- (c) eighty-two homes will be allocated for skilled farm-laborers (drivers, irrigation maintenance people, etc.).

2.220 Educational services provided will consist of a primary school, a preparatory school, and a secondary school with classrooms and a science lab.

2.221 Health facilities: A combined health unit will be staffed by three doctors, one nutritionist, one dentist, one pharmacist, two lab assistants, three midwife/nurses and two tamargias (attendants). The combined health unit will perform many functions including birth and death registration, immunization, school health, environmental health, curative functions, referrals to the hospital, and pre-and post-natal care. The combined health unit will be equipped with a small operating theater and 20 beds. The combined units should be ready to handle small operations and delivery cases.

2.222 Community development unit, day-care center and nursery school: The community development unit will be staffed by one social worker, two nursery school teachers, three dadas (nannies), one clerk and two custodians. The community development unit will offer classes needed by community members. In addition, it will operate a day-care center for babies and a nursery school for children three to six years old. A playground, equipment and toys will be provided. A sleeping room equipped with cribs and toys will be provided for babies. Parents will be expected to pay for the service. Research at Tahaddi indicated a willingness among female employees to pay for this type of highly desired service.

2.223 Fire and police station: A fire station with a fire truck will be provided for the headquarters town (one telephone line). A police station will also be provided (one telephone line).

2.224 Telephone and mail services: One room of the community development unit will be staffed by:

- (a) three telephone operators (day and night shifts, and a switchboard operator)
- (b) one mail clerk (sale of stamps, forwarding and receiving mail)

- (c) two mail distributors (two bicycles)
- (d) two telephone booths will be available for public use.

2.225 Agricultural co-operative administrative building: A headquarters building will be provided for the administrative operations necessary for agricultural co-ops in the area.

2.226 Food program building: To house five employees and store necessary supplies of food.

2.227 Guest house, restaurant and social club compound : A core guest house consisting of two rooms, a bathroom and a shower will be attached to a restaurant. Two activity rooms (TV, billiards, etc.) will be provided as a core recreational and social club for the employees of the area. The club will have a director for sports activities and a manager for daily operations. The guest house and social club will be operated by a custodian.

2.228 Mill and bakery: Research in Tahaddi indicates that the services of a grinding mill are very much needed by settlers. A settler is expected to travel once every month to the headquarters town to use the mill. The bakery will bake bread mainly for government employees' families. Settlers bake their bread at their own homes.

2.229 A consumer co-op unit will be provided for the headquarters town. The consumer co-op is crucial especially at the initial stage when there might be a lag between the time settlements receive their first settlers and the private sector businesses begin to operate.

2.230 Shopping and markets: Land will be allocated and sold to members of the private sector. An area of land will be provided and marked as a weekly market place where vegetables, poultry, eggs, butter, etc., are sold.

2.231 Commercial sector in Tahaddi: Villages in the Old Lands usually have grocery stores, carpenters, blacksmiths, sign-makers, coffee houses, etc. In the New Lands, satellite villages include homes for settlers and an agricultural co-op building only. In Ma'raka there were no shops until this year, when two grocery shops were opened in the central service village.

2.232 Normally, the commercial private sector does not move to the New Lands until potential exists for successful business dealings. This process takes time, an average of three to five years. At Abis, an older settlement, many butchers, tradesmen, doctors, etc., moved in from Alexandria five years after the establishment of the settlement.

2.233 People who live on the New Lands projects complain of the high prices of food commodities. The high prices are a result of few shops in most areas, so there is minimum competition; and the high cost of transporting commodities to the New Lands. It is interesting to see that in Tahaddi, many of the commercial ventures in the area are owned by government employees.

2.234 During the initial stage of settlement, settlers' purchasing power is low because of lack of funds, plus the fact that settlers receive food aid from the WFP ^{1/}. Usually after three years, settler families grow, and money becomes more available as the agricultural operations start to show a profit.

2.235 However, settlers need grinding mill services, markets to sell their non-farm products, barbers, carpenters, blacksmiths, etc. In order to attract private sector members, a general plan that involves incentives has to be implemented, it is suggested that free home lots are offered to members of the private sector to encourage them to settle and open business in the area.

2.236 Proposed agricultural graduates module: In this module, each agricultural graduate will own 20 feddans. The labor requirement is estimated to be eight man-year equivalents per year. As credit becomes available to graduates to purchase farm machinery, labor demands will diminish and could be reduced to three laborers and their families. In this module, it is recommended that the same satellite villages (Model No.1) to be adopted for housing farm laborers.

2.237 A central service towns' educational and health facilities would serve five satellite villages. There is a day-care center proposed for this module because graduates' wives indicated a need for this facility. Central service towns of 300 families are recommended for the housing of graduates and their families. The central service town model is the same as the central service village except for the villas provided for graduates.

^{1/} United Nations World Food Program

2.238 Housing for graduates: Upon arrival in the area, each graduate will be assigned a villa in the central service town. Available housing will probably encourage graduates to settle in the area with their families and make it possible for them to concentrate on farming their lands rather than spending energy procuring building materials in order to build their own homes. Building materials are often difficult to obtain in Egypt. Graduate villas will include two bedrooms, one salon, a dining room, kitchen and bathroom.

2.239 Villas will have potable water and electricity. A large lot will be provided so the graduate's wife can grow a vegetable garden, or raise chickens, rabbits, etc.

2.240 Community development unit: The activities to be offered in these community development units should be based on the graduates' wives needs. The survey indicates a need for a day care center and nursery school, and classes in home economics, dairy products, poultry-raising techniques, and needlework and sewing.

2.241 The availability of a nursery school which is community funded and staffed ought to free graduates' wives from child care. This would enable them to take an active part in the development of the area.

2.242 All other social infrastructure services prescribed for the central service village in the settlers' model are applicable to these central service towns.

2.243 Self-help projects: Graduates will be expected to build a social club. This will be a meeting place for graduates and their families. Cemeteries and religious institutions will be built by graduates through self-help projects. Graduates HQ town infrastructure is identical to settlers'.

2.244 Summary of the proposed infrastructure models for the New Lands: One major difference between the proposed models and the current MLR standards for New Lands settlement is that our feasibility study model offers a more elaborate satellite village than that now in existence in the New Lands of Egypt. Research findings in Tahaddi guided the decisions concerning the proposed infrastructure services.

2.245 In the New Lands, most satellite villages consist of about 600-1400 people. A population of this size definitely justifies the existence of some medical, educational and social facilities. Our proposed settlers' and graduates' models are summarized in Annex B.

2.246 Summary--problems at Tahaddi: Most of the problems can be summarized as agricultural problems and inadequate infrastructure services. The following brief highlights some of the problems:

- (a) Irrigation water: The present distribution system does not provide adequate supplies of water on a timely basis, adequate maintenance procedures, or spare parts for on-farm sprinkler systems.
- (b) Inadequate amounts of fertilizers for settlers: The co-ops extend credit only for the purchase of fixed amount of fertilizers. These allocations are standardized throughout the country. The amounts are sufficient in Delta land, but not for newly reclaimed lands. This problem is compounded with poor timing by the co-ops e.g., fertilizers are not available when they are needed.
- (c) Health problems related to the poor quality of potable water: The high degree of salt content causes health problems to the inhabitants of the area.
- (d) Bilharzia: The inadequacy of the water pumps causes people to use irrigation water for drinking. Settlers complained of bilharzia.
- (e) Inadequate educational facilities: There are high illiteracy rates among settlers compared with the rest of the country due to the fact that children's farm-labor wages are tempting to parents. The illiteracy rate is 71.33 percent.
- (f) Transportation: Transportation is expensive between the different farm sectors of Tahaddi. Irregular bus hours force people to utilize taxis that cost 20 pt for a ride to South Tahrir and 40 pt for a ride to Kom Hamadda.
- (g) Medical facilities: There is no hospital in Tahaddi and the only ambulance has been broken for a year.
- (h) Co-ops: Lack of consumer co-operatives in the small villages forces farmers to buy from the commercial sector which is characterized by very high prices.

Micro-Economic Issues in the New LandsCrop Rotations and Yields in Tahaddi

2.247 In Tahaddi, there are two agricultural seasons, the summer and winter. In the summer months, peanuts, maize, corn, potatoes, cowpeas, sesame, watermelons and tomatoes are grown by both settlers and graduates. During the winter season, October to March or April, fodder (Berseem), green peas, tomatoes, wheat, barley, broad beans, green beans and lupine are grown in the area. Graduates tend to be more experimental than settlers who stick to traditional crops. It was noticed that graduates grow more garlic, onion, prickly pears, citrus, guava, karkade, flowers, and trees than settlers. Graduates received their lands with citrus trees which were planted when Tahaddi was run as a state farm.

2.248 The following table shows settler and graduate yields in relationship with the national average.

Text Table 12

National ^{a/} vs. Tahaddi Yields

Crops	National Average (MT/fd)	Tahaddi	
		Settlers (MT/fd)	Graduates (MT/fd)
Summer			
Peanuts	.88	.53	.51
Maize	1.58	.45	.50
Potatoes	7.00	1.20	1.00
Sesame	.54	.27	.24
Watermelon	11.10	2.70	2.40
Winter			
Berseem	6.50	6.90	5.80
Green peas	3.00	1.08	.84
Tomatoes	6.70	-	-
Wheat	1.32	.68	.45
Lupines	.63	.25	.18
Barley	1.11	.42	.48
Permanent			
Citrus	-	-	2.76

a/ (Ref.4) With respect to cropping intensity, settlers cultivate their 3.3 feddans with 197 percent cropping intensity; university graduates' c.i. is 142 percent and secondary school graduates' c.i. is 175 percent. (Table B.2)

2.249 Sociological factors influencing agricultural production in the New Lands: In the New Lands, availability of water for irrigation is the major factor that influences agricultural production. So far water is plentiful, but the water distribution system has many problems discussed in Annex E. These problems are magnified when sprinkler irrigation systems are used. It was noticed that sprinkler irrigated lands have lower yields and have more problems with irrigation than surface irrigated lands. Lack of spare parts, poor maintenance, and organizational problems all reflect negatively on yields. A settler dramatized this to me by saying, "In the black land, (Old Land) it is possible not to irrigate for 15 days and the crops are not severely affected. Here in the mountains (New Lands), with the sand and the wind four days of no water could be detrimental to the plants".

2.250 Another important factor is the availability of fertilizers and pesticides. A settler at South Tahrir said, "Give us water and fertilizers and leave us alone. We can make a living here".

2.251 The number of years settlers spend in the reclaimed area seems to significantly influence production. Settlers in Abis and South Tahrir reported yields that are sometimes twice and three times as high as in Tahaddi.

2.252 For graduates, availability of labor influences agricultural production. In a highly populated country like Egypt, one does not expect to have a problem finding farm laborers. However, because of similar cropping patterns, the demands for labor increase for both the New and Old Lands simultaneously. Migrant farm workers generally prefer the Old Lands because of proximity to their villages of origin.

2.253 Drainage is a problem in some areas of the New Lands, e.g., in South Tahrir settlers recognize that the land is at a lower elevation than other areas, and this leads to accumulation of ground water.

2.254 Most settlers in the New Lands complained of the strong winds of the khamaseen ^{1/}. Sand buries the crops, and sometimes blows the crops away. Although trees are planted on the borders of each farmer's land, many farmers prefer to cut the trees after two years because the roots of the trees expand, using more land and getting in the way of tractors.

^{1/} Fifty days of strong winds occurring between March-May.

Farming Net Revenue: Settlers and Graduates

2.255 This sociological survey indicates that settlers from Village Three have an average net revenue of LE 426 annually; university graduates have a net revenue of LE 137 annually and secondary school graduates reported LE 102 annual loss. These figures represent calculated income based on reported yields multiplied by the going price for crops. It is impossible to collect income data in Egypt. Generally speaking, cross-cultural farmers do not like to reveal their incomes. In Egypt, this fear of taxation is complicated by cultural beliefs about the 'evil eye'. ^{1/}

2.256 It is possible that graduates have under-reported their yields, and exaggerated their problems, hoping that foreign agencies or the Egyptian government will take pity on them and extend relief funds or loans to these people.

2.257 It should be noted that the sociological survey results on secondary school graduates tend to contradict a commonly shared belief that secondary school graduates are more successful as farmers than university graduates. The sample represented seven percent of the total number of secondary school graduates who own land in Tahaddi. It could be that the survey sample is too low to make conclusive statements about secondary school graduates.

Farming Beliefs and Practices: Settlers Vs. Graduates

2.258 The following exists in Tahaddi:

- (a) Settlers are following the same crop-rotation patterns instituted by the state farm system in Tahaddi. Graduates tend to be more experimental than settlers. They grow crops new to the area, e.g., garlic, onions, flowers, etc.
- (b) Settlers farm all their land, 3.3 feddans. Graduates farm 74 percent of their land.
- (c) Cropping intensity of settlers' farms is approximately 196 percent. University graduates' farms have a cropping intensity of approximately 142 percent and secondary school graduates' farms have 175 percent cropping intensity.

^{1/} The 'evil eye' is a cultural belief that is based on the idea that some people have an evil effect that causes a person to lose the privileges he or she enjoys. People who believe in the effect of the evil eye seldom reveal positive points in their lives.

- (d) Settlers do not farm large areas of vegetables. This is due to the fact that they do not have the marketing potential necessary for vegetable growing. Graduates farm more vegetables because they usually own the means of transportation necessary to market these products.
- (e) Both graduates and settlers believe that topsoil and manure are necessary for good farming in sandy soils. With the present sprinkler irrigation system and all its problems, it is probably useful to bring topsoil from the Delta to the sandy soils. Settlers say "The topsoil cools the roots of the plant...and it makes the soil retain the water longer". Both groups buy manure and topsoil as their financial situations permit.
- (f) Each secondary school graduate farms about 82.5 percent of his 20 feddans, a university school graduate farms 65 percent of his 30 feddans.
- (g) Settlers buy more fertilizers than their co-op allotments. This is usually an average of three extra bags to service the 3.3 feddans. Graduates tend to sell any extra fertilizers they have not used because all the land allocated to them was not farmed.
- (h) Settlers prefer to grow winter crops early in the season so they can take advantage of high prices paid for early crops. Graduates' ability to grow crops early in the season is usually conditional upon availability of labor.
- (i) Graduates prefer to use agricultural machines for separating the peanut shells from the stem. Settlers prefer to manually separate the shells as labor is available, and is often free of charge.
- (j) Settlers spend long hours picking up weeds and harmful grass from their crops. Graduates recognize the value of this agricultural practice, but they also realize that the labor necessary for weeding is expensive.
- (k) Normally settlers do not talk readily about their yields, especially if the yields are high, Graduates are more likely to talk about good yields to demonstrate their expertise. This observation is a general one noticed during the data collecting stage at Tahaddi.

- (l) Usually settlers have a wealth of agricultural knowledge which they have acquired by (i) trial and error techniques and (ii) by talking to relatives, neighbor farmers, e.g. how to identify good fodder seeds from bad ones. A settler told the following - "You lick your finger tip and touch the seeds...they will stick to your finger.. look at it and if it has white seeds...it is no good". Most of this type of information is passed on from one generation to the next through folktales, discussions, and actual participation in farming.
- (m) Settlers in the New Lands use the Coptic calendar for their farming operations. Many of them do not know how to recite the names of the months in a sequential manner, but they know the specific dates for growing crops. Many settlers imitate their neighbors without knowing the Coptic calendar dates.

Non-Farm Income for Settlers' Wives

2.259 In the Old Lands, women contribute significantly to household budgets by raising and selling chickens, geese, ducks, rabbits and pigeons. They make cheese and butter and sell it in neighboring urban areas.

2.260 At the initial stage of settlement in the New Lands, women tend to spend more time participating in agricultural activities with their husbands. During this stage, chickens, geese and ducks are raised primarily for occasional home consumption. Many settlers cannot afford to purchase farm animals until the end of the first year of ownership. In Abis and South Tahrir, relatively old settlements, settlers reported non-farm income in the second year. Non-farm income is important to the settler's family because it provides the cash necessary for the purchase of grocery items like tea, coffee, sugar and cigarettes. It is estimated that the average non-farm income for a settler's wife is about ten to fifteen Egyptian pounds. Most of this income is from the sale of eggs and poultry, and sometimes basketry. In Tahaddi, non-farm income was non-existent because the area is a fairly new settlement.

Non-Farm Income for Graduates

2.261 In Tahaddi, many graduates own trucks which they operate as taxis in the area. The income from these operations varies considerably according to the time the truck is used for commercial purposes. The amount LE 50

was reported as average net income from operating trucks as taxis. Sometimes the trucks are rented by settlers to carry crops to the nearest market. Often graduates act as middlemen and buy crops from settlers and sell them to wholesale traders making profits estimated to be LE 60 annually. Some graduates sell their surplus fertilizers and pesticides to settlers at the black market value--estimated to be double the price paid to the agricultural cooperatives for the same products.

2.262 The income from graduates' dairy operations varies considerably according to the size of the herd, availability of transportation, and amount of time the graduate devotes to farm animals. Graduates who have settled with their families in Tahaddi, and have means of transportation could make up to LE 50 monthly net profit from the sale of dairy products. The sale of calves can be very profitable to graduates. However, it requires that a graduate devote some of his time to farm animals.

2.263 Many graduates expressed a desire to have poultry farms. However, most of these graduates are discouraged from raising poultry on a commercial scale because they lack the necessary capital and their homes have no electric power.

Farm Labor Requirements and Wages

2.264 Settlers: In Tahaddi, the majority of farmers own 3.3 feddans. The average settler family consists of 6.3 persons. A settler, with the help of his wife and four children, does not need to hire extra labor except during the harvesting and seeding periods.

2.265 Tahaddi has a unique system of evaluating payments for farm labor that varies significantly from the system in the Old Lands. In the Old Lands, a farm laborer is hired by the day to perform all tasks he or she is asked to do by the landlord. In Tahaddi, wages are determined by the quantity and the type of task performed. For example, a man's labor for harvesting 15 rows of peanuts is LE 1.00 to LE 1.25. An adult female who is hired to separate and bag peanuts is paid 70 to 80 pt a bag. A girl or a boy who separates peanuts from the vine and bags peanuts is paid 60 pt. This system is known locally as al taknin.

2.266 However, settlers have a traditional system of exchange of labor called zamala. According to this system, a farmer helps his friends and neighbors in various agricultural tasks such as threshing, bagging, seeding, etc., and would expect his friends to help him whenever he needed assistance.

2.267 Because of this system of exchange of labor, and the large families of farmers, the demand of settlers to hire labor is very low.

2.268 Graduates' need for labor is very high, because they own 20 or 30 feddans which is a much larger holding than that of the settlers. Moreover, very few graduates work with their hands on the land. Manual labor is not favorably looked upon, culturally, in Egypt.

2.269 Graduates recognize the need for mechanization as they experience difficulties both in paying the high wages required by laborers, and in the scarcity of farm laborers during the peak seasons. Graduates complained about farm-laborers not arriving for work on previously agreed-upon dates. Also it was reported that farm laborers have to be continually supervised or they would not work.

2.270 Each graduate pays LE 30 to 40 monthly to two permanent farm-laborers. Food and clothing are provided by the graduates.

2.271 In hiring farm laborers for short-term tasks, two systems are used, al taknin and al mukawla. Al taknin has been described earlier. Al mukawla is based on bidding on a job with a lump sum, e.g., to spread the topsoil on one feddan, one could pay up to LE 15. Farm laborers do not like this system as much as al taknin because they can earn more money using the latter.

2.272 In Tahaddi, moving the sprinkler irrigation system from one area to another is LE 25. The crops in Tahaddi seem to suffer from weeds that have to be removed manually, requiring an increase in labor. The average university graduate pays LE 1707 a year for laborers. The average secondary school graduate pays LE 1385 annually for labor.

2.273 The expense and the unavailability of labor forces graduates to utilize only about two thirds of their lands.

Homesteaders and Land Reclamation

2.274 In Egypt, there is very little known about the history of homesteaders and their land reclamation efforts. However, there is a common belief among most Egyptians that homesteaders have played a major pioneer role in reclaiming lands, especially lands that are near the Delta. The homesteaders' industrious attempts preceded the Egyptian government's involvement in major projects of land reclamation. Individuals find it financially lucrative to dig small wells, or to construct small canals and masguas.

(irrigation ditches) and irrigate a few feddans that are not too far from the Nile and its tributaries. Moreover, Bedouins practised simple forms of rain-fed horticulture in both the Eastern and Western deserts of Egypt.

2.275 With population pressures in areas near the Nile, the increase in land prices, and people's awareness that almost all crops can be grown in sandy soils, the number of homesteaders has increased in Egypt. The only controlling factor was that homesteaders had no legal proof of land ownership. Thus, there has always been the danger that homesteaders might lose their capital investments because the land is not officially registered in their names. Other sources of concern were Bedouins who have traditionally claimed all desert lands to be rightfully theirs. About a year ago, the Government of Egypt opened the door for homesteaders to register their lands. A homesteader pays LE 12 for every feddan owned, and requests a committee to inspect the property for the final approval of granting him the deed of trust to the land. This step is expected to encourage more people to reclaim land in Egypt.

2.276 There are three groups that are now actively involved in homesteading efforts in Egypt -- associations and large companies, individual "big investors" ^{1/} and small investors. The involvement of associations began in 1969 with the formation of Al-Azazzy Association by Shaker Dimitry. Members of the association contributed LE 50 per share. The Association adhered to government procedures in procuring approval to begin operations in lands near the Sharkiya governorate. The procedures involved the following:

- (a) an approval from the army stating that the site is not needed for military operations;
- (b) an approval from the Antiquity Administration;
- (c) an approval from the Ministry of Land Reclamation; and
- (d) an approval from the Ministry of Irrigation.

A little more than a year passed before all approvals were granted, and to the dismay of all members, the site was claimed during this period by other homesteaders who did not comply with these complex procedures.

^{1/} Individuals who reclaim up to 50 feddans, level and drill a well, are called locally "big investors".

2.277 There are many associations now working on reclaiming areas that vary in size from 5000 to 30,000 feddans. The primary goal of most of these associations is to resell the land at higher prices and realize profits for its members. However, limited research in this area indicates that many of these associations suffer from lack of dynamic management procedures and lack of experience in this highly technical field of land reclamation. On both sides of the Ismailia desert road there are large wooden signs listing names of associations that are experiencing difficulties in implementing their projects. This does not mean that there are no successful land reclamation associations in Egypt, but the majority of the associations lack the expertise and the technical know-how necessary for implementing these ambitious schemes of land reclamation.

2.278 Osman Ahmed Osman, Arab Contractors, a large Egyptian construction company, continues to invest in land reclamation projects, especially in the Sharkiya governorate. Osman A. Osman has also invested in joint ventures, e.g. the Pepsi Cola farm at Sharkiya. In Egypt, joint ventures are fairly young, having been in existence only in the last couple of years. Hence, it is difficult to judge their economic and social achievements.

2.279 Most of the so-called big investors are successful professionals or traders who are interested in the profits gained by retaining the land for a few years, then selling it at prices higher than the original purchase price. Most investors buy the land without a well, so the price could be as low as LE 50 per feddan. If a well is on the property, the price might be as high as LE 1600. Large investors can afford to grow citrus or mango trees that remain unproductive for long periods of time. Money has to be spent on levelling the land, drilling a well, buying irrigation equipment, providing agricultural inputs, including topsoil and manure, and labor. Labor could be a problem if the investor does not mobilize his contacts to find individuals interested in living and working in the land. There are three systems of tenancy that are practiced in the New Lands:

- (a) The "third" system: An individual farm laborer ~~works on the~~ land, and the landlord supplies all agricultural inputs. The farmer receives one-third of the yield for his labor.
- (b) The "fourth" system: The farm laborer works on the land, and the landlord supplies agricultural inputs, but the farmer receives one-fourth of the yield for his labor.

- (c) The "half" system: The laborer provides the labor and shares agricultural expenses with the landlord. In turn the farmer receives one-half of the yield.

2.280 The decisive factors in selecting the "third" or "fourth" systems are availability of labor, size of area cultivated, size of the laborer's family etc.

2.281 In these ventures the initial investment varies considerably based on the location of the land and its proximity to sources of water. At Sharkiya, if the land is near the Nile, surface irrigation is used along with shallow wells, 25 meters deep. But as one gets further away from the Delta, the water table could be as deep as 125 meters and deep wells become necessary. The initial investment for drilling a well and buying an irrigation pump could be as costly as LE 20,000 ^{1/} if a company is contracted to do the drilling. Private contractors charge approximately LE 12,000 to perform the same job.

2.282 Unlike associations that reclaim large areas and install sprinklers or drip irrigation pipes, big investors rely mainly on surface irrigation methods. Most of the big investors kept areas between 35 to 50 feddans. In recent years, big investors find the sale of reclaimed lands a lucrative business because of the tremendous increase in land value in Egypt. Reclaimed land that has a source of water can be sold for as much as LE 2000 per feddan. Quick profit is sought by big investors who usually sell the land within a period of three to four years. Big investors often procure land at cheap prices from Bedouins who maintain a possessive attitude about all desert land in Egypt. A Bedouin might charge a big investor between LE 30 and LE 100 per feddan depending on accessibility to main roads and the nature of the soil. ^{2/} In these types of transactions no official documents are produced to prove transfer of title. Normally, the big investor installs fences in the area, or places signs at various locations on the property.

2.283 As for the small landholding farmers, I have seen individuals owning as many as six feddans, and families owning 18 feddans. Small farmers move to the New Lands with their families, and all family members work on the land. Ibrahim, an owner of five feddans, described his experience as follows:

^{1/} All cost figures were collected as the Sharkiya governorate.

^{2/} Soils that require heavy levelling, or have a lot of gravel are cheaper in price.

2.284 "I moved here with my wife and three children three years ago. I hired a private contractor to dig the well and to install the pump for me. At that time, the entire water operation cost me LE 1500. I bought the land from our village chief who bought it from the Bedouins. I paid LE 30 per feddan. I did not have to do much levelling, but I had to dig the ditches and pick up the gravel. I have a 17 horse-power pump...it is O.K., but it is starting to cost me about two pounds daily to operate it. The cost of diesel fuel went up recently.

2.285 "The land is good...but you have to give it what it needs, fertilizers, manure, and topsoil. I buy topsoil from the Delta, the black soil is blessed...it also helps the sandy soil to retain the water. I get my fertilizers from the agricultural co-op...but most of the time I have to buy it in the black market because the co-op is late in distributing the fertilizer...you know the land cannot wait...just like the plants cannot wait for the pesticides and the fertilizers. I spent too much time in offices to get the fertilizer so I would rather buy it at black market value than leave my land all the time.

2.286 "Our biggest problem here is the tax law...I pay land tax that amounts to LE 20 per feddan. I pay LE 17 a year in taxes for the pump machine. I will have to pay one pound a year for each citrus tree I have on the land when the trees bear fruit. I pay about two pounds per ton of peanuts in taxes to the governorate. We are working hard to turn the desert into a green paradise so we should not be taxed. We are following Sadat's path in being pioneers in these desolate areas...so why pay taxes?

2.287 I built this house myself. It is built out of mud and sand bricks. I also have a barn where I keep the two cows and the donkey. My son works with me on the land, he is a smart child, so he does not need to be sent to school. The two girls are weak and not too bright. I send them to school. It is a waste of money, they will get married one day and forget what they learned at school. The girls walk six kilometers to the nearest school. Our village chief donated the land, and we contributed to the cost of the construction of the school. He is a good man. I rent his tractor. I like this arrangement better than having to rely on the co-op tractor with all the headaches that go with having to spend hours at the offices there.

2.288 "We try to be self-sufficient here and not cost the government much money. We only need roads, and good agricultural co-ops, and we will take care of the rest. It would be nice if we had a hospital nearby, or a market, but as long as the road is good we can get to the nearest town, Tell Al-Kabir."

2.289 Homesteaders build their homes on their lands, so villages do not develop. However, there is a definite sense of community that operates whenever there is a need for a school, mosque, cemetery, etc. Homesteaders have the pride and the independent characteristics of all pioneers that take it upon themselves to make the desert bloom. Many of these people believe that only through hard labor and sacrifice can land be reclaimed. A farmer expressed his hopes for the future by saying, "Now we are just making it...we have to spend time and money on the land, but a few years from now and the value of the land will triple, and the children will have something to remember us by."

2.290 It is refreshing to see individuals who take the initiative to change desert land into arable land. The cost of reclamation under the homesteading approach is minimal compared to the cost of government projects. People build their own homes, contribute to the building of schools, pay for irrigation, potable water and electricity, and require minimal administrative cost.

2.291 Homesteaders at Sharkiya grow the same crops that settlers grow at Tahaddi. In the summertime, peanuts, cucumber and peppers, tomatoes, summer vegetables and watermelons are grown; and in winter, berseem, cabbages, peas, beans, barley, and wheat. It is interesting to note that more vegetables are grown by homesteaders whose lands are near Delta markets than at Tahaddi where marketing of vegetables requires transportation.

2.292 Although a more detailed study of homesteaders and their agricultural yields is needed before one can make conclusive statements about their yields, agricultural production data procured from homesteaders indicate that they produce twice as much as settlers in Tahaddi. One might explain this high production rate by the fact that Tahaddi settlers have tremendous irrigation problems that are the result of an inadequate distribution system. Another variable might be the fact that homesteaders live and produce in a relatively independent system that is free of the complexity of the administrative and managerial bureaucracy in Egypt.

Settlers' Governorates of Origin

<u>Governorate of Origin</u>	Respondents	
	<u>No.</u>	<u>%</u>
Dakahlia	62	41.3
Munofia	44	29.3
Soha	15	10.0
Gharbia	11	7.3
Beheira	10	6.7
Fayoum	3	2.0
Kafre El Sheikh	1	0.7
Asyout	1	0.7
Kima	1	0.7
Sharkia	1	0.7
Mattrouh	1	0.7
TOTAL	150	100.0 ^{a/}

Table 2.2

Settlers' Date of Arrival in Tahaddi

<u>Year</u>	Respondents	
	<u>No.</u>	<u>%</u>
1950	1	0.67
1952	1	0.67
1957	1	0.67
1961	2	1.33
1963	3	2.00
1964	1	0.67
1965	5	3.33
1966	4	2.67
1967	64	42.67
1968	36	24.00
1969	22	14.67
1970	4	2.67
1973	1	0.67
1974	2	1.33
1975	2	1.33
1976	1	0.67
TOTAL	150	100.00 ^{a/}

^{a/} Percentages have been rounded to the nearest whole number

Table 2.3

Settlers' Former Residence Status

<u>Occupation</u>	<u>Rented Housing</u>		<u>Owned Housing</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Farm laborers	44	29.3	60	40.0
Tenant farmers	4	2.7	21	14.0
Farm owners	2	1.3	8	5.3
Farm laborer and tenant	1	0.7	2	1.3
Other occupations	<u>6</u>	<u>4.0</u>	<u>2</u>	<u>1.3</u>
TOTAL	57	25.3	93	62.0

Total sample size 150

Table 2.4

Settlers' Former Occupations and Income

	<u>Respondents</u>		<u>Approximate</u>
	<u>No.</u>	<u>%</u>	<u>Income (LE/yr)</u>
Farm laborer	104	69.3	101.2
Tenant farmer	25	16.7	175.2
Owner of land	10	6.7	187.5
Farm laborer and tenant	8	6.3	206.7
Other occupations	<u>3</u>	<u>2.0</u>	110.0
TOTAL	150	100.0	

Total sample size 150

Table 2.5

Annual Income of Tahaddi Settlers

<u>Income Level (LE/yr)</u>	<u>Respondents</u>	
	<u>No.</u>	<u>%</u>
100 - 200	1	3.8
201 - 300	6	23.1
301 - 400	5	19.2
401 - 500	7	26.9
501 - 600	5	19.2
Above 600	<u>2</u>	<u>7.7</u>
TOTAL	26	100.0
Average ^{a/}		LE 430.200

^{a/} Derived from data on individual incomes (LE/yr)

Table 2.6

Settlers and Land Type Distribution

<u>Land Type</u>	Respondents	
	<u>No.</u>	<u>%</u>
Hiddi	69	46.0
Below hiddi	51	34.0
Combination hiddi & below hiddi	17	11.3
Poor	<u>13</u>	<u>8.7</u>
TOTAL	150	100.0

Table 2.7

Settlers' Crop Yields

<u>Crop</u>	<u>Winter</u>	
	<u>Old Settlers</u>	<u>New Settlers</u>
Fodder (berseem) (cutting)	3.1	3.8
Green peas (kilo)	1,053.2	755.6
Green beans (kilo)	-	853.5
Tomatoes (kilo)	-	280.0
Barley (ardeb)	-	2.4
Lupine (kilo)	-	140.8
Citrus	-	-
Kidney beans (kilo)	-	92.4
Broad beans (kilo)	-	-
Wheat (ardeb)	-	1.5
	<u>Summer</u>	
Peanuts (ardeb)	5.7	6.1
Watermelon seed (kilo)	-	60.0
Sesame (kilo)	150.0	100.0
Tomatoes (kilo)	-	-
Watermelons	-	-
Corn (ardeb)	3.5	2.3
Citrus	-	-
Sorghum	2.0	2.0

Table 2.8

Settlers' Cropping Patterns in Feddans

	Berseem	Peas	Wheat	Lupine	Peanuts	Maize	Beans	Black-eyed beans	Vegetables
	1.0	1.5	1.5	0.5	1.0	1.5	0.25	0.5	0.5
	1.5	1.5	2.0	0.25	1.5	1.5	0.5	0.5	2.0
	1.0	2.0	1.0	0.5	1.0	1.5	0.25	0.5	
	1.0	1.5	1.5	0.5	1.5	1.0	0.5	0.5	
	1.5	1.0		0.5	1.5	1.0		0.5	
	2.0	1.0		1.0	1.5	1.0		0.5	
	1.0	1.0		0.5	1.0	1.0		1.0	
	1.0	2.0		0.25	1.0	1.5		1.0	
	1.5	1.5		0.5	1.5	1.5		0.5	
	1.5	1.5		1.0	1.5	1.5		0.5	
	2.0	1.0		2.0	1.5	2.0		1.0	
	1.5	1.0		0.5	1.0	1.5		1.0	
	1.5	1.5		0.5	1.5	1.5		0.5	
	1.0	1.5		1.0	1.5	1.0		1.0	
	2.0	3.0			1.5	3.0		0.5	
	2.5	1.5			2.0	2.5		1.0	
	1.0	2.0			2.0	1.0		1.0	
	0.5	1.5			2.0	1.2			
	1.5	1.5			1.25	1.5			
	1.0	1.5			1.0	1.0			
	2.0	4.0			2.0	0.5			
	1.0	1.0			2.0	2.0			
	2.0	2.0			3.0	1.0			
	1.0	2.0			1.0	1.0			
	1.0	1.0			2.0	1.0			
	1.5	1.5			1.0	1.5			
	1.0	1.0			1.0	1.0			
	1.5	1.5			1.5				
	1.0	1.0			1.0				
					1.5				
					1.5				
TOTAL	39.5	45.5	6.0	9.5	45.75	37.25	1.5	12.0	2.5
Number in sample =	31								
Average area per farm	1.27	1.47	2.0	3.0	1.54	12.0	0.05	0.4	0.08

Table 2.9

Old Settlers' a/ Farm-Animal Ownership

<u>Type of Animal</u>	<u>1/2</u>		<u>Number of Animals Owned</u>						<u>None</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Buffaloes	4	13.3	9	30.0	2	6.7	6	20.0	9	30.0
Cows	-	-	8	26.7	-	-	3	10.0	19	63.3
Sheep	-	-	3	10.0	-	-	-	-	27	90.0
Calves	3	10.0	8	26.7	2	6.7	-	-	17	56.7
Donkeys	1	3.3	12	40.0	2	6.7	-	-	15	50.0

a/ Thirty 'old settlers' were in this sample

Table 2.10

New Settlers' b/ Farm-Animal Ownership

<u>Type of Animal</u>	<u>1/2</u>		<u>Number of Animals Owned</u>						<u>None</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Buffaloes	4	3.3	20	16.7	-	-	-	-	96	80.0
Cows	-	-	38	31.7	1	0.8	2	1.7	79	65.8
Sheep	-	-	6	5.0	2	1.7	-	-	112	93.3
Calves	5	4.2	15	12.5	4	3.3	-	-	96	80.0
Donkeys	1	0.8	55	45.8	5	4.2	-	-	59	49.2

b/ One hundred-twenty 'new settlers' were in this sample

Table 2.11

Sources of Farm Labor for Settlers^{a/}

<u>Source</u>	Respondents	
	<u>No.</u>	<u>%</u>
Wife	118	78.7
Children	98	65.3
Friends (zamala)	76	50.7
Hired labor	57	38.0

a/ Sample size was 150 respondents

Table 2.12

Annual Wages Paid by Settlers for Farm Labor

	<u>Wages (LE/yr)</u>	
	<u>LE</u>	<u>%</u>
	9	
	24	
	30	
	30	
	40	
	48	
	50	
	60	
	65	
	<u>80</u>	
TOTAL	LE 436	
Number in Sample ^{b/}	10	
Average wages paid	LE 43.6	

b/ Of 150 respondents only ten paid wages for farm labor.

Table 2.13

Settlers' Consumer Durables Ownership^{c/}

<u>Item</u>	Respondents	
	<u>No.</u>	<u>%</u>
Radio	86	57.3
TV	8	5.3
Stove	1	0.7
Refrigerator	0	0.0
Washing Machine	1	0.7

c/ Sample size was 150

Settlers' Evaluation of Infrastructure Services in Tahaddi

Services	Very Good		Good		Poor		Utilized		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Agriculture co-op	22	14.7	109	72.7	19	12.7	-	-	150	100
Potable water	-	-	42	29.2	-	-	102	70.8	144	100
Electric power	-	-	54	37.2	91	62.8	-	-	145	100
Schools	-	-	73	63.5	35	30.4	7	6.1	115	100
Health units	-	-	11	9.1	105	86.8	5	4.1	121	100
Roads	-	-	5	3.5	140	96.5	-	-	145	100
Mail/telephone Club	-	-	1	0.7	129	99.2	-	-	130	100
Transportation	1	0.7	15	10.6	121	85.2	5	3.5	142	100

Table 2.15

Places Most Frequently Travelled by the Settlers

<u>Destination^{a/}</u>	Respondents	
	<u>No.</u>	<u>%</u>
Mit Gamr	35	23.3
Munifiya	31	20.7
Kom Hamada	24	16.0
Suhag	8	5.3
Cairo	7	4.7
Alexandria	6	4.0
Other governorates	24	16.0

Table 2.16

Settlers' Leisure Time Activities

<u>Leisure Time Activities</u>	Respondents	
	<u>No.</u>	<u>%</u>
Watching television	8	5.3
At the local coffee house	7	4.7
Visiting friends/relatives	39	26.0
Attending the movies	-	-
At home	45	30.0
No spare time	51	34.0
Total	150	100.0

^{a/} On average, respondents travel twice a year to the above mentioned destinations, 10% stayed in Tahaddi

Age Distribution of Graduates in Tahaddi

<u>Age Group</u>	<u>Respondents</u>	
	<u>No.</u>	<u>%</u>
20 - 30	10	15.6
31 - 40	50	78.1
41 - 50	4	6.2
Total	64	100.0

Table 2.18

Graduates' Farming Experience prior to coming to Tahaddi

<u>Have you practised farming before owning land in Tahaddi?</u>	<u>University Graduates</u>		<u>Secondary School Graduates</u>		
	<u>Responses</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Yes		34	75.6	15	78.9
No		11	24.4	4	21.1
Total		45	100.0	19	100.0

Table 2.19

Year of Landownership for Graduates in Tahaddi

<u>Landownership</u>	<u>University Graduates</u>		<u>Secondary School Graduates</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
1977	29	64.4	17	89.5
1978	16	35.6	2	10.5
Total	45	100.0	19	100.0

Table 2.20

Number of Graduates' Children

<u>Children per family</u>	<u>Respondents</u>	
	<u>No.</u>	<u>%</u>
None	3	4.7
1	3	4.7
2	26	40.6
3	16	25.0
4	11	17.2
5	5	7.8
Total	64	100.0
Average = 2.8		

Table 2.21

Graduates' Income Prior to Coming to
Tahaddi /LE/mo)

Income Level (LE/mo)	Respondent's Income		Spouse's Income		Combined Income of Respondent and Spouse	
	No.	%	No.	%	No.	%
Below 25	3	4.7	7	21.9	2	3.1
26 - 35	5	7.8	11	34.4	3	4.7
36 - 45	9	14.1	5	15.6	7	10.9
46 - 55	11	17.2	6	18.8	8	12.5
56 - 65	6	9.4	2	6.3	3	4.7
66 - 75	8	12.5	-	-	4	6.2
76 - 85	7	10.9	-	-	7	10.9
86 - 95	2	3.1	-	-	4	6.2
Above 95	<u>13</u>	<u>20.3</u>	<u>1</u>	<u>3.1</u>	<u>26</u>	<u>40.6</u>
Total	64	100.0	32	100.0	64	100.0

Table 2.22

Secondary School Graduates'^{a/} Farm-Animal Ownership

Type of Animal	1		2		3		4		More than 4		None	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Buffaloes	4	21.1	3	15.8	2	10.5	-	-	3	15.8	7	36.8
Cows	-	-	5	26.3	3	15.8	5	26.3	-	-	6	31.6
Sheep	-	-	-	-	2	10.5	1	5.3	2	10.5	14	73.7
Calves	1	5.3	4	21.1	3	15.8	-	-	2	10.5	9	47.4
Donkeys	7	36.8	8	42.1	2	10.5	1	5.3	-	-	1	5.3

Table 2.23

University Graduates'^{b/} Farm-Animal Ownership

Type of Animal	1		2		3		4		More than 4		None	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Buffaloes	3	6.7	11	24.4	3	6.7	4	8.9	14	31.1	10	27.2
Cows	7	15.6	5	11.1	1	2.2	1	2.2	6	13.3	25	55.6
Sheep	-	-	3	6.7	3	6.7	5	11.1	3	6.7	31	68.9
Calves	3	6.7	3	6.7	1	2.2	1	2.2	1	2.2	36	80.0
Donkeys	8	17.8	20	44.4	1	2.2	1	2.2	1	2.2	14	31.1

^{a/} Sample size of secondary school graduates was 19

^{b/} Sample size of university graduates was 45

Cropping Patterns per Feddan -- Secondary School Graduates

No. of Farms	Peanuts	Barley	Berseem	Peas	Water-melon	Sesame	Lupine	Maize	Beans	Sorghum	Winter tomatoes	Summer tomatoes	Citrus	Garlic	Karkade
1	15.0	9.0	10.0	3.0	3.0	3.0	5.0	5.0	10.0	2.0	1.0	3.0	10.0	1.0	2.0
2	9.0	5.0	3.0	3.0	3.0	10.0	4.0	1.0	5.0	1.0					
3	10.0	10.0	10.0	2.0	5.0	4.0	3.0	3.0	5.0						
4	7.5	5.0	5.0	5.0	3.0	3.0	2.0	7.0							
5	10.0	4.0	5.0	3.0	2.0	5.0	3.0	5.0							
6	8.0	5.0	2.0	1.0	3.0	1.0									
7	7.0	4.0	3.0	3.0	2.0	4.0									
8	10.0	1.0	2.0	6.0	4.0	5.0									
9	12.0	12.0	2.0	5.0	1.0	2.0									
10	12.0	12.0	2.0	1.0	3.0	4.0									
11	10.0	7.0	3.0	8.0	2.0										
12	8.0	8.0	3.0	4.0	4.0										
13	10.0	4.0	3.0	6.0	3.0										
14	9.0	9.0	2.0	4.4											
15	10.0	10.0	2.0	4.4											
16	12.0	10.0	3.0	2.0											
17	13.0	9.0	10.0	10.0											
18	8.0														
19	10.0														
TOTAL	190.5	124.0	70.0	70.8	38.0	41.0	17.0	21.0	20.0	3.0	1.0	3.0	10.0	1.0	2.0
Ave. area /farm	10.0	6.5	3.7	3.7	2.0	2.2	0.9	1.1	1.1	0.2	0.1	0.2	0.5	0.1	0.1

Table 2.24

Cropping Patterns Per Feddan -- University Graduates

No. of Farms	Peanuts	Peas	Berseem	Barley	Water-melon	Lupine	Sesame	Citrus	Maize	Water-melon Seed	Winter Tomatoes	Garlic	Nursery	Guava	Sorghum	Berseem Seed	Alfalfa	Wheat
1	10.0	5.0	3.0	5.0	5.0	15.0	2.0	9.0	3.0	3.0	2.5	1.0	3.0	2.0	1.0	4.0	6.0	6.0
2	15.0	5.0	5.0	8.0	2.0	6.0	2.0	1.0	4.0	3.0	2.0	1.0			1.0			
3	11.0	7.0	7.0	5.0	5.0	2.0	5.0	4.0	1.0	3.0	2.0	5.0			1.0			
4	7.0	5.0	9.0	7.0	2.0	1.0	1.0	15.0	3.0	1.0	2.5							
5	6.0	4.0	9.0	5.0	2.0	4.0	1.0	9.0	3.0	3.0	3.0							
6	9.0	5.0	3.0	7.0	3.0	15.0	2.0	14.0	1.0	2.5								
7	13.0	15.0	2.0	10.0	5.0	15.0	1.0	15.0	2.0									
8	8.0	6.0	3.0	3.0	1.0	1.0	3.0	7.0	2.0									
9	10.0	5.0	10.0	9.0	2.0	1.0	1.0	10.0	6.0									
10	10.0	10.0	4.0	5.0	3.0	1.0	5.0		2.0									
11	21.0	5.0	2.0	10.0	2.0	1.0	2.0		5.0									
12	18.0	5.0	5.0	6.0	4.0		4.0											
13	9.0	6.0	3.0	6.0	2.0		3.0											
14	14.0	3.0	10.0	5.0	4.0													
15	11.0	3.0	10.0	4.5														
16	6.0	3.0	10.0	5.0														
17	15.0	6.5	7.0	6.0														
18	13.0	2.5	5.0	6.0														
19	12.0	6.0	2.0															
20	15.0	7.0	3.0															
21	9.0	6.0	10.0															
22	15.0	6.0																
23	15.0																	
24	23.0																	
25	15.0																	
26	14.0																	
27	15.0																	
28	12.0																	
29	10.0																	
TOTAL	361.0	126.0	122.0	112.5	42.0	63.0	32.0	84.0	32.0	15.5	12.0	7.0	3.0	2.0	3.0	4.0	6.0	6.0
Ave. area /farm	12.4	4.3	4.2	3.9	0.1	2.2	1.1	2.9	1.1	0.5	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2

Table 2.25

Crops Grown and Average Yield per Feddan
for University Graduates (1977)

No. of Farms	Peanuts (kg)	Barley (kg)	Berseem (cutting)	Peas	Watermelon seed (kg)	Sesame (kg)	Sorghum (cutting)	Winter tomatoes (kg)	Lupine (kg)	Wehat (kg)	Alfalfa (kg)	Watermelon (ton)	Berseem seed (kg)
1	525	480	2	1400	100	240	4	1100	150	75	314	1	500
2	375	720	3	1000	50	240	3						
3	525	120	2	1000	25	960	2						
4	825	600	2	1000	10	60							
5	300	480	4	250	500								
6	105	360	2	500	40								
7	188	120	2	500	70								
8	225	120	4	2000									
9	225	360	2	1000									
10	300	120	3	200									
11	375	300	4	375									
12	300	120	2	200									
13	450	240	2	257									
14	1200	120	2										
15	375	600											
16	375												
TAL	6668	4060	36	9682	795	1500	9	1100	150	75	314	1	500
Average Yield per feddan	416.7	3.24	2.6	744.7	113.6	3.75	3	1100	150	75	314	1	500

Table 2.26

Crops Grown and Average Yield per Feddan
for Secondary School Graduates 1977

No. of Farms	Peanuts (kg)	Peas (kg)	Berseem (cutting)	Sesame (kg)	Barley (kg)	Lupine (kg)	Watermelon seed (kg)	Watermelon (tons)	Sorghum (cutting)	Chickpeas (kg)
1	375	1000	3	120	360	75	2	3	3	35
2	450	750	4	33	360	100	15			
3	225	500	2	180	240	75	100			
4	300	1000	1		120		33			
5	375	1000	2		84		25			
6	225	375	2		240		50			
7	225	500	2		48		130			
8	300	1000	1		300					
9	300	41	2		720					
10	450	1000	4							
11	900	1500								
TOTAL	4125	8666	23	333	2472	250	355	3	3	35

Ave.
Yield
per
feddan

375 787.82 2.30 111.0 247.7 83.33 50.71 3 3 35

Crops Grown and Average Yield per Feddan
for Secondary School Graduates 1978

1	150		3	120	120		33			
2	562		-	-	-		-			
TOTAL	712		3	120	120		33			
Ave. Yield	356		3	120	120		33			

Labor Costs for University Graduates

<u>Landownership Year</u>	<u>No. of Respondents</u>	<u>Total Labor Cost^{a/} LE/yr</u>
1977	24	42,830
1978	<u>13</u>	<u>20,356</u>
TOTAL	37	63,176

Table 2.29

Labor Costs for Secondary School Graduates

<u>Landownership Year</u>	<u>No. of Respondents</u>	<u>Total Labor Cost^{b/} LE/yr</u>
1977	16	22,425
1978	<u>2</u>	<u>2,500</u>
TOTAL	18	24,925

Table 2.30

Graduates' Evaluation of Tahaddi Infrastructure Services^{c/}

<u>Services</u>	<u>Very Good</u>		<u>Good</u>		<u>Poor</u>		<u>Not Utilized</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Agricultural co-op	25	39.1	30	46.9	9	14.1	-	-
Potable water	1	1.6	2	3.1	37	57.8	24	37.5
Electric power	1	1.6	4	6.3	35	54.7	24	37.5
Educational services	-	-	3	4.7	45	70.3	16	25.0
Transpor- tation	2	3.1	11	17.2	51	79.7	-	-
Roads	-	-	8	12.5	56	87.5	-	-
Health services	1	1.6	2	3.1	61	95.3	-	-

a/ Annual average cost LE 1,707.4; monthly average LE 142.3

b/ Annual average cost LE 1.384.7; monthly average LE 115.4

c/ Sample size of graduates was 64

Table 2.31

Incomes of Secondary School Graduates

<u>Landownership</u> <u>Year</u>	<u>No. of</u> <u>Respondents</u>	<u>Total Income</u> ^{a/} <u>LE/yr</u>
1977	15	24,470
1978	<u>2</u>	<u>1,951</u>
TOTAL	17	26,421

Table 2.32

Incomes of University Graduates

<u>Landownership</u> <u>Year</u>	<u>No. of</u> <u>Respondents</u>	<u>Total Income</u> ^{b/} <u>LE/yr</u>
1977	23	54,485
1978	<u>15</u>	<u>29,174</u>
TOTAL	38	83,659

Table 2.33

Age Distribution and Percentages of
Migrant Farm Laborers ^{c/}

<u>Age</u> <u>Group</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
6 - 12	1	2.6	3	50.0	4	9.1
13 - 20	15	39.5	1	16.7	16	36.4
21 - 30	10	26.3	2	33.3	12	27.3
31 - 40	4	10.5	-	-	4	9.1
41 - 50	<u>8</u>	<u>21.0</u>	<u>-</u>	<u>-</u>	<u>8</u>	<u>18.2</u>
TOTAL	38	100.0	6	100.0	44	100.0

Table 2.34

Governorates of Origin for Migrant Farm Laborers

<u>Governorate of Origin</u>	<u>Respondents</u>	
	<u>No.</u>	<u>%</u>
Beheira (Kom Hamada)	38	86.4
Menufiya (Minuf)	4	9.1
Gharbeya (Tanta)	1	2.3
Giza (Imbaba)	<u>1</u>	<u>2.3</u>
TOTAL	44	100.0

a/ Annual average income LE 1,554.2; monthly average LE 129.5

b/ Annual average income LE 2,201.6; monthly average LE 183.5

c/ Sample size of 44

No. of Children per Family for
Seasonal Migrant Farm Laborers

No. of Children per Family	Married Respondents	
	<u>No.</u>	<u>%</u>
0	1	7.1
1	2	14.3
2	2	14.3
3	1	7.1
5	4	28.6
7	2	14.3
8	1	7.1
15	<u>1</u>	<u>7.1</u>
TOTAL	14	100.0

Table 2.36

Age Distribution of Government Employees

Age	Respondents	
	<u>No.</u>	<u>%</u>
20 - 30	10	20.0
31 - 40	25	50.0
41 - 50	12	24.0
Above 50	<u>3</u>	<u>6.0</u>
TOTAL	50	100.0

Average age 36.8

Table 2.37

Level of Household Income of Government Employees

Income Level <u>LE/mo</u>	Respondent's Income		Spouse's Income		Combined Income of Respondent & Spouse	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Below 15	1	2.0	-	-	-	-
15 - 25	13	26.0	3	25.0	10	20.0
26 - 35	19	38.0	5	41.7	16	32.0
36 - 45	12	24.0	4	33.3	10	20.0
46 - 55	3	6.0	-	-	1	2.0
Above 55	<u>2</u>	<u>4.0</u>	<u>-</u>	<u>-</u>	<u>13</u>	<u>26.0</u>
TOTAL	50	100.0	12	100.0	50	100.0

Average Income 33.5 31.2 41.0

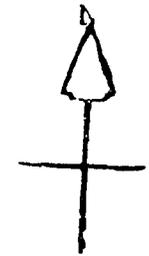
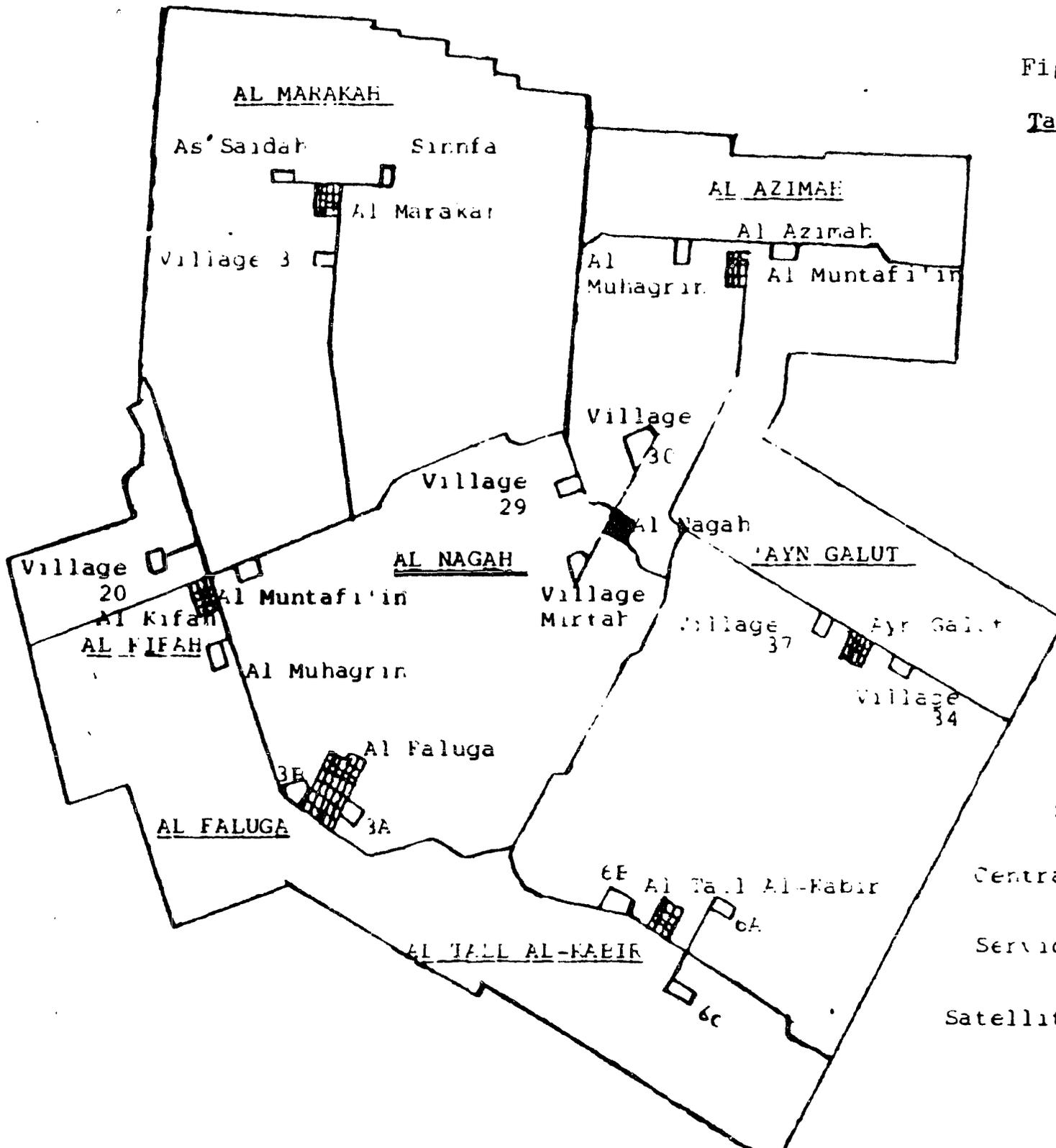
Table 2.38

No. of Children per Family of Government Employees

No. of Children	Respondents	
	<u>No.</u>	<u>%</u>
None	4	8.0
1	6	12.0
2	12	24.0
3	8	16.0
4	7	14.0
5	8	16.0
More than 5	<u>5</u>	<u>10.0</u>
Average = 3.3	TOTAL	50 100.0

Figure 2.1

Tahaddi Villages



Scale: about 1:90,000

- Central Village 
- Service Village 
- Satellite Village 

Settlers' Questionnaire

Name:

Sex:

Age:

Marital Status: Married Single Divorced Widowed

Place of Origin: Village Town Governorate

Date of Arrival in Tahaddi:

Method of Recruitment and Opinion About It:

No. of Children: Male Female Total

Settlers' Literacy Status:

- (a) reads and writes
- (b) reads but cannot write
- (c) illiterate

Educational Status of Children:

- (a) elementary school
- (b) preparatory school
- (c) secondary school
- (d) university
- (e) illiterate

1. Why did you decide to move to Tahaddi?

- (a) to own land
- (b) to improve your standard of living
- (c) both (a) and (b)

52. Do you worry about your husband getting rich?

53. Do you own any jewellery?

Yes

No

54. What kind of jewellery?

(a) necklace

(b) earrings

(c) bracelets

7. What was your monthly income before coming to Tahaddi?
8. What was your spouse's income - if employed?
9. Do you spend your own funds on the land?
10. How much per year?
11. On what?
12. Do you own any of the following?

<u>Kinds of Animals</u>	1	2	3	4	5	6	7	8	9	10	More than 10
-------------------------	---	---	---	---	---	---	---	---	---	----	--------------

Buffaloes
Cows
Sheep
Calves
Donkeys

13. What do you grow on your land?

<u>Winter Crop</u>	<u>University Graduate</u>	<u>Sec. School Graduate</u>	<u>Average Yield/feddan</u>
--------------------	----------------------------	-----------------------------	-----------------------------

Fodder (berseem cutting)
Green peas (kilo)
Green beans (kilo)
Tomatoes (kilo)
Barley (ardeb)
Lupine (kilo)
Citrus
Kidney beans (kilo)
Broad beans (kilo)
Wheat (ardeb)
Karkade
Garlic
Onion
Others

<u>Summer Crop</u>	<u>University Graduate</u>	<u>Sec. School Graduate</u>	<u>Average Yield/feddan</u>
Peanuts (ardeb)			
Watermelon seed (kilo)			
Sesame (kilo)			
Tomatoes (kilo)			
Watermelons			
Corn (ardeb)			
Citrus			
Sorghum			
Garlic			
Onion			

14. How many permanent laborers do you have on your land?
15. How much do you pay them monthly?
16. How many temporary farm laborers do you use?
17. How much does labor cost you annually?
18. How do you rate the following services?

Evaluation of Infrastructure Services in <u>Tahaddi</u>	Very Good	Good	Poor	Not Utilized	Total
---	-----------	------	------	--------------	-------

Agricultural co-op
 Potable water
 Electric power
 Education services
 Transportation
 Roads
 Health services

19. Comments:
20. What are some of the agricultural problems you have in Tahaddi? Elaborate on the problems.
21. Did you build a house in Tahaddi?

Yes	No
-----	----

Government Employees' Questionnaire

Name:

Sex:

Age:

Salary:

Marital Status: Married Single Divorced Widowed

Spouse's Occupation:

Spouse's Salary:

No. of Children: Male Female Total

Date of Arrival in Tahaddi:

1. Does your family live with you in Tahaddi?

Yes No

2. If not, why not?

3. Are you happy in Tahaddi?

Yes No

4. What are your problems in Tahaddi?

5. What causes these problems?

6. Does Tahaddi have problems in the following areas?

Comments

- (a) potable water
- (b) power stations
- (c) educational system
- (d) transportation
- (e) inflation
- (f) recreational facilities
- (g) others

7. Would you like to continue living in Tahaddi or would you like to be transferred?

- (a) stay in Tahaddi
- (b) wants a transfer

8. Where do you spend your spare time?
- (a) visiting friends
 - (b) movies at Badr
 - (c) club
 - (d) coffee house
9. What facilities would you like to see added to Tahaddi?
- (a) secondary school
 - (b) telephone and mail office
 - (c) better quality of potable water
 - (d) power station
 - (e) movie house
 - (f) other

For Females Only

10. Do you work? Yes No
11. What is your job?
12. Where do your children go when you go to work?
13. What are your problems as a female living in Tahaddi?
14. What do you think of the quality of life in Tahaddi?
15. Do you use any birth control methods?
- Yes No
16. What method do you use?
17. What would you like to see added to Tahaddi?
- (a) home economics classes
 - (b) women's club
 - (c) family planning clinic
 - (d) hospital
 - (e) movie house
 - (f) other

Migrant Farm Laborers' Questionnaire

Name:

Sex:

Age:

Marital Status: Married Single Divorced Widowed

Village of Origin:

Educational Status:

- (a) reads and writes
- (b) reads but cannot write
- (c) illiterate

No. of Children: Male Female Total

Recruitment Method:

1. How many days do you work per month?
2. How much is your daily wage?
3. What geographical areas have you previously worked in?
4. Where do you stay when working?
5. Does your family accompany you to the camp?
Yes No
6. How long do you stay on these assignments?
7. What do you think of the camp facilities here?
(a) excellent
(b) good
(c) poor
8. What are the major problems here?
9. Would you like to go back to your home village every day?
Yes No

10. Do you send your children to school?
Yes No
11. Which schools do they go to?
12. How many members of your family are farm laborers?

For Females Only:

13. Where do you leave your children when you are at work?
14. What would you like to see added to the camp?
- (a) more blankets
 - (b) better food
 - (c) cleaner housing quarters
 - (d) more sleeping space
15. Comments:

Bibliography

1. Abul-Kheir, Abdul-Wahab
"Report on Social Indications of an In-depth Study Preliminary to the Third Evaluation of WFP Project (ARE - 57 Exp)", Ministry of Land Reclamation, Egypt.
2. Abul-Kheir, Abdul-Wahab
1978
"Rural Development System in the New Sector". Paper presented at the Seminar on Integral Rural Development in Egypt, Latin America and the Caribbean, Egypt.
3. _____
1973
"An Integrated Development Plan for Orabi Settlement, Mariut". Integrated Development and Settlement of New Lands Irrigated by High Dam Water, Egypt.
4. _____
"Community Development and Social Welfare".
5. Das, Ram
1975
"Compendium on Basic Statistical Information on the Phase II of the Project". United Nations Development Programme, Egypt.
6. El-Abd, Salah
1974
"Human Settlement in the Newly Reclaimed Areas of the ARE", Cairo.
7. El-Abd, Salah
1974
"Nile Resettlement in Respect of Development of Rural Infrastructure and Industrialization and the Relevance of this Experience for Application Elsewhere". Dar El Taawen Press, Egypt.
8. El-Khalily, Abdel Latif
1979
"Report on Female Workers in Badr Ready-Made Clothes Factory". Population and Family Planning Board Research Dept. Egypt
9. Epstein, Scarlett
1975
"Rural Social Science Development and the Role of Women in Rural Development". Ford Foundation, Dacca

10. _____
1971
- "Evaluation of Past Settlement Experience with Emphasis on Assessment of Types of Tenure Systems Applied by the Government in the Reclaimed Land Irrigated by High Dam Waters". United Nations Development Programme. Egypt.
11. Fakhouri, Hany
1972
- "An Egyptian Village in Transition". Holt Rinehart & Winston, New York.
12. _____
1979
- "Feasibility Study of West Nubariya Extension Reclamation & Settlement Project". Vol.7 ULG Consultants, Warwick.
13. Fahim, Hussein
1975
- "The Study & Evaluation of the Rehabilitation Process in the Newly Settled Communities in Land Reclamation Areas - The Nubrian Settlement in Kom Ombo Region Upper Egypt" (Part II), Social Research Center of the American University in Cairo
14. Geering, Theodore
1978
- "Agricultural Land Settlement", World Bank Publication
15. Gawish, Mahmoud
1972
- "Social Planning in Newly Reclaimed Areas in Egypt". Egyptian Authority for Cultivation and Development. Egypt.
16. Harik, Iliya
1977
- "Decentralization of Development in Rural Egypt".
17. Hassouna, W.A.
1972
- "Egypt's Experience in Comprehensive Planning". Paper presented at the United Nations Seminar of the 2nd Correspondence Course in Social Planning. Cairo, March 27-April 17, 1972, Egypt.
18. Kanaan, Adnan
1972
- "A Summary of an Experimental Scheme for Establishing Houses For Farmers of Abis Extension Farm by Self-help Efforts". United Nations Development Programme. Egypt.

19. Khattab, Hind
1965
"Quta-Resettlement Project: Establishment and Emergence of a New Community" (Ph.D. Thesis).
20. Loza, Sarah
1977
"Ready-made Clothes Factory in Badre, South Tahrir". Population & Family Planning Board Research Dept. Egypt.
21. _____
1976
"Managing Planned Agricultural Development". Governmental Affairs Institute. Washington D.C. USA
22. Mickelwait, Donald & Sweet, Charles
1976
"Bringing Developmental Change to Rural Egypt: A Study of the Organization for the Reconstruction of the Egyptian Village". Development Alternatives Inc., Washington D.C.
23. Morss, Elliott R;
Hatch, John K;
Mickelwait, Donald R
and Sweet, Charles F.
1976
"Strategies for Small Farmer Development", Vol. I. Westview Press Inc. Colorado USA.
24. Nadim, Assad
1979
"The Role of the Village Bank in the Rural Community". Al Azhar University, Egypt.
25. Soliman, Adly
1973
"Social Development in the New Rural Communities in Egypt". Dar El Taawen Press, Egypt.
26. Tadros, Helmi, R.
1975
"The Study & Evaluation of the Rehabilitation Process in the Newly Settled Communities in Land Reclamation Areas - Newly Settled Communities in the Nile Delta", (Part I). Social Research Center of the American University in Cairo.
27. Tadros, Helmi R
1973
"A Study of the Rehabilitation Process in the Newly Settled Communities in the North Western Delta". The American University in Cairo, Egypt.

18. Tadros, Helmi R.
1978 "Rural Resettlement in Egypt".
The American University in Cairo.
19. Voll, Sarah Potts
1979 "Report on Egyptian Land
Reclamation Since the Revolution".
Egypt.
20. Wassan, Salah
1972 "Study and Suggestions on Criteria,
Priorities, and Methods of Selecting
of the Settlers in the Newly
Reclaimed Lands Irrigated by High
Dam Waters". Ministry of Land
Reclamation. Egypt.

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NEW LANDS PRODUCTIVITY

EGYPT

WORKING PAPERS

3, 4, 5, 6, 7, 8,
9, and 10

PACIFIC CONSULTANTS
Washington, D.C.

FEBRUARY 1980

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 3

THE CREDIT AND INPUT SUPPLY SYSTEM

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 3

THE CREDIT AND INPUT SUPPLY SYSTEM

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Table 3.1

WORKING PAPER No. 3

THE CREDIT AND INPUT SUPPLY SYSTEM

Co-ops in the Tahaddi Area

3.1 Membership and area: All farmers in the reclaimed lands are organized in co-ops established by the Ministry of Land Reclamation (MLR) according to Law No. 317 of 1956. Table 3.1 shows that the Tahaddi area has currently 554 graduates and intermediates (agricultural high school graduates) with an average area of 23.6 fd each organized in nine co-ops, in addition to 1050 settlers with an average of 3.3 fd each organized in three co-ops. Thus the graduates' co-ops are smaller than the settlers' in terms of membership (average 62 vs. 350 members each), but larger in terms of area (average 1453 vs. 1155 fd each). All of these co-ops (with the exception of Al Ma'rakah settlers' co-op, which dates from 1971) were established in 1977-79 and thus are still in the formation process.

3.2 Co-op services include: (a) provision of fertilizers, pesticides, herbicides, seeds, animal feed and sacks; (b) rent of agricultural machinery, such as tractors and sprayers; and (c) marketing of peanuts. Co-op credits are awarded to members, mostly in kind (fertilizers and pesticides), but there are some cash loans for tractor hire and laborers as well.

3.3 Co-op facilities typically include a pesticide store, two fertilizer depots (100 to 500 MT capacity each), and a one- to two-room office. Some co-ops plan to add a peanut collection area.

3.4 Co-op personnel consists of four to ten employees, generally including one manager, one to two bookkeepers, one warehouseman, one to two tractor and sprayer operators and two to four guards. The salaries (which range from LE 35 to LE 20 per month) of this personnel and their other expenses are borne entirely by the MLR. For their potential volume of operation, the co-ops are considerably overstaffed; a typical agency of The Development and Agricultural Credit Bank (para 3.10) serves a similar area with one accountant and one storekeeper.

3.5 Co-op capital consists of members' subscriptions, amounting to LE 1 per feddan. Table 3.1 indicates that

on December 31, 1978, about 68 percent of the subscriptions were paid; the older co-ops have generally completed their quota. The table also shows that in comparison with co-op liabilities, co-op capital is insignificant (on the order of 1 percent). A remarkable provision of Law No. 317 states that co-op capital (not invested in new co-op projects) cannot be augmented out of profits (para 3.6) to more than LE 3 per feddan. Such a regulation certainly militates against the long-term financial stability of the co-ops.

3.6 Co-op profits: The co-ops do not make interest charges to their members, but derive their profit from a commission on both cash and credit sales. In the case of fertilizer this commission amounts to about 3.5 percent (plus about seven percent freight charge). Other items have a markup of about five percent. Co-op profits in 1978 averaged about LE 1 per feddan (Table 3.1). It should be noted, however, that (a) employees' salaries are charged to the Ministry of Land Reclamation, (b) there is no specific provision for depreciation, and (c) most building maintenance is deferred. The addition of these expenses would result, in most or all cases, in a negative balance sheet. Co-op profits are distributed according to the following key:

(a) capital reserves	25%	^{1/}
(b) incentives to co-op council	5%	
(c) incentives to co-op employees	5%	
(d) social assistance	20%	
(e) distribution to members	<u>45%</u>	
Total	100%	

3.7 Co-op credit recuperation rates: Production credits of the Development and Agricultural Credit Bank (para 3.11) to the Tahaddi co-ops in 1978 were fully repaid. Of co-op production credits to members, over 90 percent were repaid on time and the rest are in arrears. The Al 'Ubur co-op, for example, reports that all loans have been repaid except some loans contracted by graduates who have left the area. It may be expected that as agricultural production stabilizes, the recuperation rates will resemble those in the Nile Valley, which are above 90 percent. The long-term loans (land, housing, etc.) are still in their grace period, so that their recuperation rates cannot yet be estimated.

^{1/} When total capital reaches LE 3 per feddan, this portion will also be distributed to the members.

The Tahaddi Co-op Union

3.8 The Tahaddi co-op union, established on July 25, 1979, is a second-level organization for the nine Tahaddi graduate co-ops. The council of the co-op union is elected by one representative per every 20 co-op members. ^{1/} The capital of the co-op union is made up of 20 percent of the subscription capital of the member co-ops, plus 25 percent of its own profits distributed as shown in para 2.6. The co-op union plans to furnish the following services:

- (a) a tractor and irrigation equipment repair workshop;
- (b) sale of tractor spare parts;
- (c) collection of crops for marketing;
- (d) truck service for input and product transport; and
- (e) common projects (e.g. dairy, poultry).

The General Society of Land Reclamation Co-ops

3.9 The General Society of Land Reclamation Co-ops, established under the auspices of the Ministry of Land Reclamation (MLR), is the roof organization for all co-ops in the reclaimed lands. Its capital is constituted of 20 percent of the subscription capital of all reclaimed-lands co-ops and co-op unions, augmented by MLR funds. Every co-op has an account in the General Society. General Society services to co-ops consist of:

- (a) Guarantee of production loans: The General Society deposits in the Principal Bank for Development and Agricultural Credit Bank (PBDAC) about LE 2 million as a guarantee for the credit granted by the PBDAC to the reclaimed-lands' co-ops (such credit totalled in 1978 about LE 20 million). In case of default on the part of any co-op, the General Society compensates the PBDAC.
- (b) Medium-term credit: The General Society awarded LE 10,000 in credit from 1977 to 1979 to each of the Tahaddi co-ops for the purchase of two tractors and implements. For other co-ops the General Society has financed pumps, beekeeping, calf fattening, chicken incubators, cheese production, etc. General Society credits are granted only to member co-ops, not to individual farmers.

^{1/} For this reason a separate co-op union is contemplated for the settlers, since in a joint co-op union their numerical preponderance would assure them control.

- (c) Marketing: The General Society assists member co-ops in marketing (in the case of Tahaddi -- for peanuts) through arranging agreements with consumption co-ops.
- (d) Representation: The General Society also studies problems which burden farmers in the reclaimed lands (e.g. irrigation, drainage, soils, electricity, veterinary and medical services) and represents the beneficiaries vis-a-vis the appropriate agency.
- (e) Training: The General Society provides training for co-op councils and officers through the MLR National Rural Development Center at Maryut.

The Agricultural Banking System

3.10 The Principal Bank for Development and Agricultural Credit (PBDAC) is by far the largest source of credit for Egyptian small farmers, since the activities of other banks in the agricultural field are smaller and oriented to commercial agricultural enterprises, and since non-official agricultural lending is apparently limited. In 1977 the PBDAC system supplied about LE 85 million in production credit to about three million farmers, and had about LE 22.4 million in outstanding medium- and long-term loans. The PBDAC is the sole importer of fertilizers in Egypt and the largest importer of pesticides; thus it is the major distributor of agricultural inputs, whether for credit or cash. The PBDAC which is constituted under the jurisdiction of the Ministry of Agriculture according to Law No. 117 of 1976, is a holding company for 17 governorate-level Development and Agricultural Credit Banks.

3.11 The Development and Agricultural Credit Banks (DACB's), which are operationally autonomous entities, provide credit to individual farmers and to co-operative societies through a network of about 150 branches, 720 village banks and 2200 agencies. Previous reports (Ref. 12) have awarded this credit system high marks for performance; as an indicator, the recuperation rate on short-term loans made in 1977 was 94.3 percent. In the Old Lands, the DACB's took over the credit function from the co-ops, so that, at present, most farmers have individual accounts in village banks. As an example, Beheirah DACB (which has jurisdiction over the Tahaddi area) supplied production credit with a value of LE 17 million to 205,000 farmers through 12 branches, 66 village banks and 370 agencies in 1978. It granted, in the same year, LE 8 million in medium- and long-term

credit. The recuperation rate on production loans was cited as 92.6 percent and on medium-term loans as 100 percent.

3.12 A village bank consists usually of a three-room office (for manager, bookkeepers and cashier, respectively); in addition to furnishing credit, it can accept farmers' savings and perform other financial transactions. An agency is an input distribution warehouse (usually with a floor space of 200 to 300 m²) staffed by a storekeeper and a bookkeeper. The agency is empowered to extend credit in kind to local farmers in good credit standing, so that they do not have to go to the village bank for prior approval. The DACB's also maintain a network of shonahs, which are fenced and usually roofless areas used for delivery of crops marketed through the public sector and for storing agricultural inputs.

3.13 Constraints of the PBDAC system: previous reports (Ref. 12) have noted that the PBDAC system does a relatively satisfactory job of delivery of production credit to the farmers. However, the same sources noted also shortages of (a) middle- and long-term credit funds, (b) credit for noncontrolled crops, (c) transportation, storage, handling, office and telephone facilities, (d) appropriate training, (e) adequate statistics, and (f) sufficient authority for village bank managers. The financial viability of the PBDAC system suffers also from low interest rates on production credit (para 3.18) and from overstaffing in Cairo and the governorate capitals.

3.14 Credit constraints particular to the reclaimed lands: in addition to the above general constraints, farmers in the Tahaddi area have the following problems with inputs and credit supply:

- (a) the distance from existing bank outlets (about 30 km to Kom Hamadah, 35 km to Umm Sabir) consumes time and adds to transport costs;
- (b) the above outlets do not always carry the type of fertilizer most appropriate to the farmers' needs (shortage of animal feed is also a problem);
- (c) the fertilizer quotas have been calculated for the Delta soils, and are insufficient for the poorer reclaimed soils;
- (d) while the fertilizer quotas are obtained on credit, pesticides are available to reclaimed-lands farmers for cash only;

- (e) unlike farmers in the Old Lands, those in the reclaimed lands may not obtain production credit from the bank individually but only through their cooperatives;^{1/}
- (f) the lack of land titles (para 3.26) cuts farmers in the reclaimed lands off PBDAC medium-term credit; and
- (g) farmers in the reclaimed lands may receive less priority than the more established farmers in the old lands in the allocation of scarce inputs.

3.15 Projected DACB activities in the Tahaddi area: the DACB of Al Beheirah Governorate is currently undertaking the steps necessary to set up an agency at the Tahaddi central village in time for the 1980 winter planting. The agency will be installed in two existing warehouses with a total fertilizer storage capacity of 500 MT. This volume is considered sufficient, as the agency will serve mostly as a staging area for inputs expedited to the 12 Tahaddi co-ops, which have their own storage facilities. The DACB will provide the inputs at Tahaddi at no extra charge. This will save the co-ops the time and expense needed to fetch their inputs from the Kom Hamadah or the Umm Sabir depots, as is the case at present. Tahaddi farmer leaders consider that through the installation of this agency, most of the input provision problems will be solved. There are no plans at present to set up a village bank at Tahaddi, or to install a bank agency in every co-op headquarters.

Short-Term Credit

3.16 The inputs distribution process in the Tahaddi area starts with the council of every co-op collecting from the members their proposed cropping patterns for the season. The co-ops total the members' requests and submit the plans to the Tahaddi Region co-op office, which presents the joint plan to the Ministry of Agriculture agency at Kom Hamadah for approval. The draft plan is usually approved without changes within about a week and

^{1/} The reasoning behind this policy is that, due to the lack of water reliability in the reclaimed lands, the farmer's crop is not a sufficient guarantee for his production credit, so that he must have a co-op guarantee.

is then forwarded to the DACB, which usually has the requested quantities on hand at its nearest agency. Thus, the time from preparation of the cropping patterns and input delivery to the farmers totals about two months.

3.17 The production credit cycle: inputs for the winter season should be supplied to the farmers by October, and the farmer does not market his crop and repay the credit until April or May. For the summer season, inputs must be ready by February, and marketing does not terminate before November. Thus the credit periods for the two seasons overlap; consequently, the total requirements for production credit equal the sum of the summer and winter requirements.

3.18 Credit terms: production credits are supplied by the PBDAC system mostly in kind. Credit is provided at an interest of 2.5 percent for a period of up to 10.5 months (para 3.17). For late payments, the interest is increased to 4.5 percent.^{1/} On credit for fattening calves (about seven months) the rate is 7 percent, and land collateral of 0.5 feddans is required for each head.

3.19 Recuperation rates: it was stated by co-op officers in Tahaddi that about 90 percent of the production credit is repaid by the farmers to the co-ops on time and the balance a few months later, and that the percentage of defaults is insignificant. If a farmer is two years in arrears on his production credit he is denied additional credit, but may purchase production inputs for cash. Table 3.1 indicates that about 51 percent of members' transactions with the co-ops were for cash.

3.20 Credit amounts: Table 3.1 shows that the credit input purchases of eight graduate co-ops from the DACB in 1978 amounted to LE 174,036, and the input credits of one settler co-op to LE 7,796. These production credits were claimed to represent most of the fertilizer consumption plus a part of the pesticide consumption. Dividing

^{1/} Interest rates on production credit are subsidized by Central Government transfers to the PBDAC. A growing part of the lending funds originate from villagers' deposits and savings (at 5 to 8.5 percent according to length of deposit period) in the village banks.

the credit amounts by the number of feddans on which the inputs were used ^{1/} shows that production credits averaged 11.3 LE/fd for the graduates and only 3.1 LE/fd for the settlers. These figures should be used with caution since part of the credits represent inputs which were stocked by the co-ops for future seasons. However, the figures indicate that the graduates had considerably better access to production credits, and consequently probably utilized more fertilizer per feddan. The differential becomes even more pronounced if it is considered that some of the fertilizer purchased by the Al Ma'rakah settlers' co-op was used by settlers from the Ath Thawrah and Al'Adi co-ops, which were not yet organized at the time. Comparing the value of fertilizers and pesticides used by members of eight graduate and one settler co-op in 1978 (Table 3.1) with the areas cultivated in the same year gives an average fertilizer and pesticide consumption of LE 8.8 per feddan per crop.

3.21 Adequacy of fertilizer application: if the optimal fertilizer consumption in sandy soils is estimated (based on U.S. practice) to be roughly 800 kg/fd of nitrogenous 15.5 percent fertilizer equivalent, 400 kg/fd of superphosphate equivalent and 130 kg/fd of potassium sulphate per crop, with a total value of 34.6 LE/fd/crop, the above figures imply that average present fertilizer consumption in the Tahaddi area is only about 25 percent of the optimal.

3.22 Constraints on production credit and input supplies: the occasional present shortage of inputs of the correct type in the desired quantity and at the right time appears to be more of a constraint than the lack of sufficient production credit. This is indicated by the fact that small farmers pay, for fertilizer purchased on the free market, a premium of about 50 percent above the official prices. Thus, the adequate supply of inputs seems to be more of a distribution than a credit problem. It should be noted in this connection that, as the PBDAC is the sole importer of fertilizers in Egypt, free-market trade in fertilizers is based on secondary sources, i.e.

^{1/} Summer and winter 1978 crop areas for Al 'Ubur, 6 Uktubar and Al Ma'rakah co-ops; summer crop areas only for the remaining co-ops, which received their winter season fertilizers from the South Tahrir Co. as part of the 20-year land credits.

on some farmers selling a part of their quota to others. Team inquiries indicated the volume of free-market trade in fertilizers to be relatively small.

Medium-Term Credit

3.23 Credit items: medium-term credit (generally three to five years) is usually granted by the PBDAC, through the village banks, for the purchase of tractors, pumps and other agricultural machinery, orchard planting, livestock, poultry, beekeeping and other agricultural and agro-industrial activities.

3.24 Credit conditions: for all medium-term credits extended by the PEDAC system, an established and registered land property is required as collateral. For tractor and pick-up truck purchases, the applicant must make an advance payment of 25 percent, while 75 percent may be obtained as PBDAC five-year financing at an interest rate of eight percent. For tractors and pick-ups, the land collateral must be at least ten feddans, which effectively bars the access of small farmers to credit for such items. For other types of agricultural machinery, 100 percent financing may be obtained from the PBDAC system at the same interest rates. For livestock, a down payment of LE 50 per head is required, and the balance of the purchase price (a total of LE 300 to 380) is paid over five years at six percent. For beekeeping and other items, the interest rate is 11.5 percent.

3.25 Medium-term credit needs: in the Tahaddi area many graduates utilized their establishment funds to purchase tractors and/or pick-ups; thus the basic land cultivation and market transport needs are covered. On the other hand, the graduates (for whom paid labor is the main expense item) are especially interested in labor-saving machinery such as seed drills, peanut diggers, etc.

3.26 Land titles in the reclaimed lands: settlers and graduates receive, upon being selected by the MLR, an ownership certificate for their land. Only when the land price is fully paid (at present -- 20 years) do they obtain an ownership deed which entitles them to use the land as loan collateral. There are no arrangements for a second lien whereby they could place as collateral the part of the land already paid for. Thus individual settlers and graduates have no access to PBDAC medium- and long-term credit unless they own landed property elsewhere, and they are limited to credit obtained through the co-ops.

3.27 Co-op medium-term credit originates from the General Society of Land Reclamation Co-ops (para 3.9). The General Society has granted every co-op at Tahaddi LE 10,000 as ten-year credit at five percent interest for the purchase of two tractors with implements and sprayers, as well as some establishment grants. The General Society also guarantees the PBDAC production loans to the co-ops. Individual farmers do not have access to General Society credits, but may obtain medium-term loans of up to LE 200 from their co-op.

3.28 Livestock credits are provided in the reclaimed lands by the MLR Livestock Fund for a five-year term at a symbolic interest rate of one percent. Each graduate receives eight cows and each intermediate-school graduate, five, at no down payment. Each settler receives one cow, if he can make a 20 percent down payment, and may obtain another cow once the first one is repaid.

3.29 Repayment of animal fund credits by the co-ops has originally been two years in arrears; recently one year's payments have been made, and after marketing the current peanut harvest, repayments are expected to be back on schedule. Payments made by the beneficiaries to the co-ops are reported to be 90 to 95 percent of those due. However, since some graduates utilize a part of the long-term credits to repay short- and medium-term credit, the above rate may diminish once the disbursement of long-term credits is completed.

3.30 Credit priorities: for the graduates, medium-term credit constitutes at present a less pressing problem than the timely supply of adequate quantities of production credit, since the basic needs for medium-term credit (housing, livestock and tractors) have been provided. Additional medium-term credit may be more important for settlers than for graduates, as the former raise more livestock per feddan.

Long-term Credit

3.31 Long-term credit is provided by the MLR to graduates and settlers in the form of basic production necessities according to the following schedule:

Prices of Long-Term Credit Items, LE

Reclaimed land: according to quality	LE 350 to 800/fd
Soil improvements (imported soil, manure, etc.): for poor soils for medium-quality soils	LE 100/fd LE 50/fd
Windbreaks:	LE 2/tree
Housing: for graduates and intermediates for settlers	LE 4,000 LE 650
Workers' housing (for graduates and intermediates):	LE 750
Stable: for graduates (8 head) for intermediates (5 head)	LE 800 LE 500

3.32 Credit amounts and disbursement: the above prices signify that total long-term credits amount to about LE 20,000 to 30,000 each for graduates (according to quality of the soil): LE 15,000 to 21,000, for intermediates; and LE 2,300 to LE 3,400, for settlers. In addition, graduates and intermediates receive a one-year grant for living expenses equal to 60 percent of their former salaries. Table 3.1 shows that the graduate co-ops established in 1977 (Al 'Ubur, 6 Uktubar) received in 1978 most of the long-term credit disbursed in cash (for housing and stables -- LE 5900 to 6200 per beneficiary), while for the newer co-ops disbursement is in process.

3.33 Reimbursement schedule: the long-term credit is to be repaid to the MLR at 3 percent compound interest over a 20-year period, (para 3.34) following a three-year grace period, according to the following schedule:

Years 1- 3:	grace period;
Years 4- 5:	annual payment = 1/2 of (1/20 of total credit);
Years 6- 8:	annual payment = 3/4 of (1/20 of total credit);
Years 9-23:	annual payment = 1/15 of credit outstanding at the end of five years.

3.34 A forthcoming MLR decree is likely to extend the period to 25 years. Assuming interest payments to start

at the year four, the present value of a 25-year repayment schedule at an interest rate of 15 percent (considered the minimal real interest rate on capital in Egypt) is only 18 percent of the principal (i.e. a subsidy element of over 80 percent). Taking into account also the loan collection costs and the possibility of default, compared with its present policy the GOE would be saving money if it offered the land for immediate sale at 20 percent of the current land prices used as a basis for repayment (para 3.31). For the beneficiaries, such a purchase would signify access to PBDAC medium-term credit, as well as the pride of ownership. Thus at least some of the beneficiaries will take advantage of this offer.

Conclusions

- 3.35(a) Co-ops in the reclaimed lands are overstuffed by government-salaried personnel and cannot be expected to become self-supporting organizations in the foreseeable future. Nevertheless, they are likely to remain for some time as the main vehicles for credit and input supplies in the reclaimed lands; it is not yet feasible to contemplate direct access of farmers to the Development and Agricultural Credit Bank (DACB), as is the case in the Nile Valley.
- (b) The credit recuperation rate is generally above 90 percent for both short- and medium-term loans.
- (c) The value of inputs consumed by ten co-ops (Table 3.1) indicates a fertilizer consumption amounting to only about 25 percent of the optimal rates, and consequently a need for a significant expansion of the input supply and credit system.
- (d) The existing shortages in input supplies are due to the inadequacy of the existing fertilizer quotas (which are based on the requirements of Delta soils) to the Tahaddi soils, as well as to distribution problems; shortage of short-term credit is less of a constraint than shortage of the inputs themselves. In the case of Tahaddi, many distribution problems should be solved by the installation of a DACB agency at Tahaddi, which is expected shortly.
- (e) Medium-term credit is generally very restrictive as to quantities and conditions. In Tahaddi this does not currently have much effect on the graduates, who are still disbursing their establishment credits; however, the settlers (due to their

small plot size and lack of ownership titles) are effectively barred from access to individual medium-term credit. This poses problems for their livestock purchases and other improvements.

Recommendations

- 3.36(a) PBDAC fertilizer quotas for the reclaimed areas should be increased on a project-specific basis above those prevailing in the Nile Valley. This would require a decision by the appropriate Ministry of Agriculture national-level committee.
- (b) The MLR and PBDAC should take the necessary dispositions to enable graduates and settlers to place that part of their land which is already paid for as a collateral (at current land values) for individual PBDAC medium-term credit.
- (c) As suggested in para E.29 the PBDAC should open a line of short-term credit on which co-ops and individual farmers could draw for irrigation system maintenance expenses, and which would be paid out of harvest proceeds as is the case for other production credits.
- (d) The MLR should offer for immediate sale to new or existing beneficiaries, the land it develops at 20 percent of the land price currently used as the basis for land repayments.

Table 3.1

Data on Co-ops in the Tahaddi Area, 1978

Graduate Co-ops	No. of Members	Total Area, fd	Average Area per Member, fd	Share Capital, LE	Value of Agricultural Equipment, LE	25-Year Credit <u>f</u> / Distributed in 1978, LE	
						Per Co-op	Per Member
1. Al Basatin	33	688	20.8 ^a /	n.a.	n.a..	30,000 ^e /	909
2. Al 'Azimah	79	1342	17.0 ^b /	24	193	75,883	961
3. Al Iman	60	1521	25.4 ^a /	555	899	70,380	1173
4. As Sumud	59	1137	19.3 ^d /	460	1051	112,345	1904
5. Al Kifah	55	1765	32.0 ^c /	128	1209	136,708	2486
6. Al 'Ubur	66	1916	29.0 ^c /	2259	10,570	242,598	3676
7. 6 Uktubar	78	1728	22.2 ^d /	1478	9,222	314,540	4033
8. At Tahaddi	68	1249	18.4 ^d /	1065	606	143,668	2133
9. Ayn Galut	56	1732	30.9 ^c /	885	10,643	62,460	1115
Subtotal Graduate co-ops	554	13,078	23.6	6854+	34,393+	1,188,582	2145
<u>Settler Co-ops</u>							
1. Al Ma'rakah	484	1637	3.4	2126	4564	n.a.	n.a.
2. Al 'Adl	299	948	3.2	1634	n.a.	n.a.	n.a.
3. Ath Thawrah	267	880	3.3	n.a.	n.a.	n.a.	n.a.
Subtotal Settler co-ops	1050	3465	3.3	3760	4564		
TOTAL	1604	16,543	10.3	10614+	38,957		

- a/ Graduates -- 30 fd or 15 fd orchards each
b/ Intermediates -- 20 fd or 10 fd orchards each
c/ Graduates -- 30 fd each
d/ Intermediates -- 20 fd each
e/ Preliminary figures
f/ Excluding livestock credit

Table 3.1

Data on Co-ops in the Tahaddi Area, 1978

	Members' Purchases at Co-ops		Members' Cash Purchases at Co-ops LE	Fertilizers & Pesticides Used by Members, LE ^{b/}	Input Purchases of Co-ops from Banks on Credit, LE	
	Total	Per Fd			Total	Per fd
<u>Graduate Co-ops</u>						
1. Al Basatin	15,000 ^{a/}	22	n.a.	n.a.	n.a.	n.a.
2. Al "Azimah	38,065	29	17,567	14,838	8,218	5.4
3. Al Iman	25,414	17	18,859	15,468	5,020	4.2
4. As Sumud	34,356	30	18,016	21,693	23,816	24.3
5. Al Kifah	39,614	22	17,067	20,366	13,803	11.3
6. Al 'Ubur	74,609	39	49,677	44,766	59,104	15.7
7. Al Uktubar	112,196	65	44,591	49,117	36,212	10.0
8. At Tahaddi	57,351	46	22,800	25,568	19,162	12.4
9. 'Ayn Galut	38,137	22	16,475	14,294	8,751	5.4
Subtotal Graduate co-ops	435,642	33	205,052+	206,110+	174,036+	11.3
<u>Settler Co-ops</u>						
1. Al Ma'rakah	n.a.	n.a.	22,662	24,525	7,796	3.1
2. Al 'Adl	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
3. Ath Thawrah	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Subtotal Settler co-ops			22,662	24,525	7796	3.1
TOTAL			227,714+	230,635+	181,833+	14.4

^{a/} Preliminary figures^{b/} Total production inputs -- cash and credit

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 4

DOMESTIC MARKETING

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 4

DOMESTIC MARKETING

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NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

WORKING PAPER NO. 4

DOMESTIC MARKETING

Market Prices and Quotas

4.1 The government effects some control over producers of the basic crops in two ways:

- (a) marketing quotas assessed against producers, and
- (b) "price support" or a fixed price at which the government will purchase the commodity.

4.2 Under the marketing quota system, fixed prices are paid to farmers for some commodities on the basis of a specified quantity, or on the basis of yield per feddan.

4.3 The GOE levies marketing quotas on wheat, rice paddy, fava beans, lentils, peanuts and onions. However, marketing quotas are not enforced on peanuts, lentils and onions, and there are no marketing quotas for sesame. Producers of these commodities, as well as of other vegetables and fruit, sell to local marketing organizations and to private merchants.

4.4 According to law, each farmer must grow specific crops on a certain percentage of his land holding. The percentage depends upon the location of such holdings. Government-specified quotas for produce to be delivered to official collection centers differ between districts depending upon general land fertility and productivity. Likewise, different areas of the country receive different marketing quotas for the same commodity. For example, there are 18 different quotas for the 18 governorates which produce wheat, while lentil growers are assessed the same quota regardless of where their farm is located. Quotas vary also according to size of farm. Farmers with holdings of five feddans or less deliver reduced quotas, or are exempt from marketing quotas. It is estimated that these smaller holdings represent about 57 percent of the total farming area in the country.

4.5 There are no delivery quotas for fruit or vegetables, although the Ministry of Supply places a ceiling on the retail price of these commodities. These announced official prices change from season to season. However, these official prices are apparently not adhered to by the trade. This is reflected by the extremely large seasonal variations in price, as shown in Tables 4.1 and 4.2 for vegetable and fruit prices on the Cairo market. (It was reported in the local newspapers that the price of tomatoes on the Cairo Market on October 4, 1979 was twice the current official price, and that small seedless grapes are officially priced at 18 piasters but sell at not less than 35 piasters).

4.6 Growers of the "main and essential" crops are assured a fixed price for their production, as noted above. Such crops include wheat, rice, fava beans, lentils, peanuts, sesame, onions, sugar cane, and cotton. These fixed prices are usually slightly lower than the local free market price.

4.7 Prices received by producers are generally the result of two types of prices. There is the price fixed by the government for the amount called for in the marketing quota, and there is also the price received by the producer for the quantity they produce and sell above their marketing quota. Prices for quantities sold above quotas are determined by the supply-demand situation in the village market. The Ministry of Agriculture reports a farm-gate price which is a combination of these two prices--or the average price of the total quantities sold. It includes a weighted average of the value of the quantity sold to the government at the "fixed" price, and the value of the quantity sold on the free market or outside the quota.

4.8 Government-controlled farm prices have been criticized as being too low. Reportedly the result of this has been a shift, on the part of producers, from producing products with administered farm prices to those marketed mostly in the private sector, such as fruit and vegetables. The return per feddan on these products is usually higher. The effect that the free market price has on the overall or farmgate price is indicated in Table 4.3. The farm prices for cotton, wheat, rice, horse beans, and lentils were raised an average of 30 percent in January, 1979, (Table 4.1 and 4.2).

4.9 The quoted market prices for vegetables and fruit (Table 4.1 and 4.2) are the result of a sample survey of wholesale and retail establishments during the period indicated.

4.10 Fruit prices on the Cairo Market are subject to large seasonal variations in response to supply and demand conditions. Substantial differences in size, quality and variety also contribute to price variations.

4.11 These relationships between farmgate prices and retail prices for fresh fruit and vegetables may not be too much out of line when one considers the system under which they are marketed. For example, it has been estimated that 50 percent of the tomatoes sold at the farm gate never reach the consumer in the market place in Cairo. This is the estimated spoilage loss in the marketing channel between producer and consumer. Such losses are not too surprising considering the fact that:

- (a) the tomatoes (and other fresh produce and fruit) are usually left on the vines too long before being harvested; they usually are fully ripe when harvested, which means a shorter market life;
- (b) there is only superficial sorting and grading at the producer level, and thus a large percentage of damaged produce and fruit enter the marketing channel;
- (c) storage facilities are inadequate (no refrigeration) and there is too much rough handling in the marketing process; and
- (d) the slow turnover of supplies by both wholesaler and retailer results in an extended market span.

4.12 Egypt and the Cairo Market are not an isolated case. Similar situations have been witnessed in other North African and Central African Countries, Southeast Asia, the Caribbean and Central American Countries.

Producer Cooperatives

4.13 Crops and quotas: The major winter crops produced in the Tahaddi area are peas, clover, lupine, barley and horse beans, while the major summer crops are peanuts (with 6,000 feddans this year), melons, sesame and citrus. Peanut harvesting was in full swing in October 1979. Both peanuts and sesame^{1/} are produced under the quota system.

^{1/} At present, farmers are free to sell sesame either under quota or at the higher free-market price.

Under the system, this year graduates are assessed 2.5 ardebs of 75 kgs per feddan, while settlers are assessed a quota of 1.7 ardebs. Currently producers receive LE 20 per ardeb of 75 kgs.

4.14 Producers in the Tahaddi area are organized in cooperatives to facilitate the government crop production and collection program. There are 12 cooperatives in the Tahaddi area. The nine graduate co-ops belong to a co-op union (para 3.8).

4.15 The co-op union deals only with peanuts and sesame--the two crops produced under the quota system. These are collected by the union and paid for at the official price. Thus the cooperative acts only as a quota-crop receiving agent at the assembly and collection points. Its only function is to weigh and record the deliveries by each producer.

4.16 There is no committee or cooperative organization to perform any produce marketing function. Each producer is left to market his own surplus output of vegetables and/or fruit. Some neighboring farmers do assemble their produce into small truck-load lots and bring it to the Rod Al Farag market in Cairo, where it is sold to wholesale produce dealers. The costs involved in this operation are shared equitably by the producers. In the case of melons, there are some buyers--wholesalers--who come into the region and contract directly with producers for the whole crop. They usually specify their own quality requirements, date and point of delivery, as well as price.

4.17 There is clearly a need for a cooperative organization for the producers to more profitably market their crops. These producer marketing organizations should be separate and not related to the existing government-imposed cooperatives which exist more to facilitate crop collection and enforce the quota system, than to perform marketing functions for non-quota produce.

Producer Organization for Marketing

4.18 Producers will need to organize a cooperative body to market the non-quota portion of their crops. This is especially necessary with respect to fresh fruit and vegetables. These must be expedited through the market channel to the consumer. At present, in newly settled areas, even the largest producers would be unable to attract competition among merchants for their individual output. They are thus at the mercy of buyers who sometimes agree to divide the territory among themselves.

4.19 Reports indicate that existing cooperatives are used more as vehicles to implement government policy than to meet the needs of individual producers. They are designed to assure the government of a quota supply of major crops, to insure crop rotation, and to provide a central point for distribution of items such as seeds and fertilizers furnished in kind to insure the desired productive practices. According to reports, rigid price and supply controls have contributed to black-market operations in some of the items, such as fertilizer, distributed by the cooperatives. The feeling among some people is that farmers have little confidence in cooperatives; this lack of confidence serves to reduce the effectiveness of the cooperatives.

4.20 To reduce spoilage between producer and consumer, which is estimated to be 40 percent or more, improvements are needed in the following areas:

- (a) facilities for sorting and grading;
- (b) packing and transportation;
- (c) containers; and
- (d) protection from hot sunlight.

4.21 Co-ops in Egypt are price-takers rather than price-makers. Reportedly, several ministries besides the Ministry of Agriculture have an influence on the prices received by farmers, as well as on the price which they pay for production inputs. The organizational structure of the cooperative system is complex. The cooperatives in the New Lands are under the jurisdiction of the Ministry of Land Reclamation (para 3.9). They perform functions such as credit, input distribution and the collection of quotas which, in the Old Lands, are provided by agencies of the DACB. They are controlled by the Ministry of Land Reclamation more than by their membership.

Conclusions Regarding the Existing Marketing System

4.22 A definite need exists for producers' cooperatives to actively participate in the marketing process. An effective training program is necessary for both members and management to improve their marketing expertise. This would provide a basis for marketing improvements in the area of fruit and vegetables as well as livestock and other products. New area development projects should provide the facilities necessary for making these improvements.

4.23 The summer crops which require a better marketing system include, in addition to peanuts and corn, the whole array of warm-weather vegetables, from tomatoes and potatoes to green beans and cantaloupes. The winter crops which require marketing would include (besides some tomatoes, potatoes and onions) wheat, barley and clover, cabbage and lettuce, as well as root crops such as turnips, carrots and garlic. The permanent crops include the citrus fruit and the deciduous fruit (pears, apples, etc.)

4.24 Marketing of the vegetable crops would not vary much by season, except for the extra protection from the sun required for the summer vegetable crops. The same marketing facilities, equipment and personnel could be utilized for both seasons.

4.25 The size of the farm units will have only a limited effect on marketing arrangements or alternatives. This is because no one single unit acting alone will be able to effectively market its production. It will simply not be large enough to develop "market muscle". This can come only through organization and cooperation among neighborhood producers to perform group marketing in lots large enough to attract traders and allow bargaining for the most favorable price.

4.26 The major constraints to effective fruit and vegetable marketing are:

- (a) lack of producer marketing organization, which obliges each producer to market his own crops and in most cases compels him to deal on the buyer's terms.
- (b) failure to select for quality and grade (size, maturity, color, bruises, etc.) at the producer level, resulting in lower average prices to producers since the saleable quantity must support all transportation, handling, packing and other costs.
- (c) unavailability of refrigeration facilities at any level of the marketing system--producers, wholesalers or retailers.
- (d) lack of grades and standards and failure to select and pack by grades and standards.
- (e) harvested produce stands in the field or by the roadside during the heat of the day. There is no precooling or protection from the sun until it is picked up for transportation to market.

- (f) overfilling packing crates results in crushing and damage to produce, especially when the crates are stacked too high for shipment. In addition, containers presently in use not only fail to protect the product but in some cases actually damage the produce.
- (g) the marketing time is increased by the use of animal-drawn carts in the distribution system. This method of transportation adds to produce damage due to the rough handling it encounters. In some cases, there is also contamination of the produce.
- (h) most produce moves through two or more wholesalers before reaching the retailer, resulting in excessive handling, increased bruising and higher prices to consumer and/or lower prices to producers.
- (i) facilities at the retail level are not adequate to handle highly perishable fruit and vegetables. In addition, the lack of uniform quality indirectly results in further damage to the goods, since consumers tend to choose individual items very carefully, causing additional handling and bruising.

Proposed Produce Marketing Plan

4.27 The proposed major infrastructures of a 30,000-feddan project (farmer-settler model) is based on five 6,000-feddan clusters, each cluster containing one central service village of 200 settlers (5 fd each) and five satellite villages of 200 five-feddan settlers each. The marketing system recommended for this structure is discussed in the following:

- (a) The 200 farmers in each village should organize a marketing group. Each of the five villages in the cluster should likewise form a cluster-level organization, representing the 1,200 farmers with 6,000 feddans. The 6,000 farmers in the project area of 30,000 could then federate into one central marketing organization.
- (b) A simple fruit and vegetable sorting and packing shed should be built at each satellite village center. These can be very elementary sheds with dirt floors and simple roofs to which farmers would bring their produce.

These village sheds would afford some protection from the sun and provide space for weighing scales, basic sorting and packing equipment and other working space for the personnel. These facilities should be suitable for all crops and vegetables and thus be in almost continuous use throughout the year.

The operation and administration of these village sheds should be as simple as possible. Each shed would be operated by two persons: (i) the "manager" who would operate the scales and keep records, and (ii) a packer-leader. Most preliminary sorting would be done by the farmers themselves, as price will be a function of product quality.

- (c) In addition to the shed, scales, working tables and appropriate packing crates and sacks, each village should have a pick-up truck to move the produce. The produce would be shipped directly to the urban market, or to the central cluster assembly point serving the five satellite villages for overnight storage and subsequent transport to market as appropriate.

4.28 At the cluster assembly point it is suggested that the following be provided:

- (a) A simple office to provide working space for a Manager-director and one recording clerk-secretary-bookkeeper. The office should be equipped with appropriate filing cabinet space, typewriter, adding machine, etc.
- (b) A simple shed for repacking and regrading, as needed also for temporary storage of unsold or off-grade produce. This shed should be of the same construction as the village sheds except that it should have slatted walls for proper ventilation and for providing security. The cluster-level facilities should be on a plot of ground large enough to accommodate the produce trucks and other vehicles and equipment. The lot should be fenced in for additional security of equipment and produce.
- (c) The personnel should consist of not more than one manager, one recording clerk-secretary, one night guard, and graders/repackers as necessary.

4.29 Estimated costs of shed operation, including depreciation:

(a) At Satellite:

Shed 7 x 12m = 84m² @ LE35 = 3,000
amortized in 20 years = 150 per year

Scales, work tables etc. LE300
in 20 years 15 per year

Personnel

1 sorter-packers at LE50 per month
= LE600 per year

Manager-scale operator 1,800 per year

Total personnel costs LE 2,400 per year

(b) At Cluster:

Shed fence and office
10 x 15m = 150m² @ LE50 = LE 7,500
amortized in 20 years = LE 375 per year

Scales, office furniture, work tables, etc.,
LE 600 in 20 years = LE 30 per year

Personnel

3 sorter-repackers @ LE50 per month
or LE600 per year x 3 = LE 1,800 per year

Clerk-secretary 1,200 per year

Manager-supervisor 2,000 per year

1 Watchman 480 per year

Total personnel costs = LE 5,480 per year

- (c) In addition, there will be the pick-up truck costs, i.e. depreciation, operation, fuel, maintenance, repairs, etc. plus driver's salary of LE800 per year (LE67 per month), as well as supplies consisting of crates, boxes, sacks or other containers, and office supplies. Once the depreciation schedule is established, total operating expenses could be determined on a monthly basis or other satisfactory time period. Expenses could then be pro-rated on the basis of the value of sales for the period. For example, if expenses amount to LE100,000 and sales were LE 1 million (or one pound expenses for every 10 pounds of sales) then producers could be assessed 10 piasters for every one pound worth of produce he delivered, regardless of the commodity or produce he delivered.

4.30 Fuel cost estimate for operating small village and cluster pick-up trucks in marketing: assuming (i) a round trip to central market of Cairo (or Alexandria) six days per week (300 days per year) with average daily distance travelled amounting to 330 kilometers, or 100,000 km per year; (ii) fuel consumption of 8.8 liters per km (11,400 liters/year), and (iii) gasoline price of 15 pt/liter, fuel cost would be LE 1,710 per year.

Training Marketing Personnel

4.31 For farmers in each land reclamation project area to successfully organize for common ownership and use of marketing facilities, the provision of guidance and training, to both producers and administrators in co-operative marketing procedures is a necessary and most important task.

4.32 USAID training project: In this connection USAID is embarking on a Cooperative Marketing System Project, which was approved on 1 August 1979, for five million dollars for the years 1980 through 1983. The Cooperative League of the USA (CLUSA) is the primary contractor for the project and will provide the long- and short-term personnel.

4.33 A recently-organized (1978) United Cooperative Society (UCS) is an association of four base cooperatives in four governorates. These four cooperatives united to form a central Cooperative Marketing Society to market members' produce (fruit and vegetables). This is the central marketing authority and nucleus for this project.

4.34 The four governorates included in this project are: Alexandria, Beheirah (which includes the Tahaddi area), Gharbiah and Minufiyah. The stated basic purpose of the project is to increase the efficiency and effectiveness of private agricultural marketing cooperatives.

4.35 Some of the project goals are to establish a system for uniform standards and grading of produce; to provide facilities for grading and packing of produce; and to provide in-country training for cooperative personnel and member producers.

4.36 According to the Project Paper, this new project is designed to establish in Egypt an institutional capability to provide management, cooperative development and marketing guidance. The AID and CLUSA personnel involved expressed the hope that this project will foster the extension of techniques and knowledge beyond the pilot cooperatives, and that it will provide the opportunity for the U.S. input to potentially affect a much larger number of Egyptian cooperative members.

4.37 It is suggested that efforts be made to include marketing and cooperative management personnel from the land reclamation projects in the personnel training program of the AID Cooperative Marketing Project. USAID/Egypt personnel concerned with the cooperative project indicated this might be possible.

Table 4.1

	<u>Prices of Vegetables (Cairo Market), Pt/Kg</u>							
	<u>March 1979</u>		<u>July-August 1979</u>		<u>September 1979</u>		<u>Aug. '75</u>	<u>July- August 1976</u>
	Wholesale	Retail	Wholesale	Retail	Wholesale	Retail	----Retail	Only----
Tomatoes	10.0	13.0	3.0	5.0	8.0	11.0	5.1	7.2
Potatoes	10.0	13.0	10.0	13.0	11.0	15.0	9.5	11.2
Onions	7.0	9.0	7.0	9.0	7.0	10.0	6.1	5.6
Squash (long)	4.0	5.0	6.0	8.0	7.0	10.0	6.2	5.1
Squash (small)	5.0	6.0	8.0	10.0	9.0	13.0	5.2	7.2
Green Peppers	11.0	14.0	10.0	13.0	9.0	12.0	5.2	7.2
Eggplants			3.0	5.0	4.0	5.0	3.3	5.7
Green Beans	5.5	7.0	8.0	10.0	9.0	12.0	5.2	7.2
Okra			10.0	13.0	12.0	15.0	9.3	13.6
Garlic	6.0	9.0			10.0	13.0		
Carrots	4.0	5.5						
Spinach	4.0	5.0	4.0	6.0				
Mologhia			4.0	6.0			4.1	4.1

Source: Price Monitoring Office, Ministry of Supply.

Prices of Fruit (Cairo Market), Pt/Kg

	<u>1979</u>		<u>1977</u>
	<u>Wholesale</u>	<u>Retail</u>	<u>Retail</u>
Mango	30-80	60-130	50
Oranges (navel)	9.0	11.0	6.0
Apricots	20-30	30-40	15
Grapefruit	10-20	20-30	10-20
Peaches	15-30	20-40	15-20
Apples (local)	15-20	30-40	15-20
Apples (imported)	70-80	100-160	
Figs	20-25	40-60	20-50
Dates	15-30	30-50	20-25
Guava	5-20	10-40	5-25
Pears	10-30	20-50	10-20
Strawberries	50-80		50-80
Lemons	20-60	70-90	20-60

Source: Rod Al Farag

--Wholesale Market

Relation of Fixed and Farmgate Prices for
Various Crops

Prices in LE/MT

<u>Commodity</u>	1978 <u>Farmgate Price</u>	1978 <u>Fixed Price</u>	1979 <u>Fixed Price</u>
Fava beans	134.5	96.8	129.0
Lentils	209.1	156.3	218.8
Onions	NA	33.0	33.0
Rice paddy	70.0	55.0	65.0
Peanuts	NA	186.7	186.7
Cotton	218.4	218.4	281.9
Sesame	NA	208.3	208.3
Wheat:			
High-yield	-	53.4	70.0
Local	-	46.8	63.4

Source: MOA

NEW LANDS PRODUCTIVITY IN EGYPT

TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 5

PRICES

JANUARY 1980

PACIFIC CONSULTANTS

WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 5

PRICES

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WORKING PAPER NO. 5

PRICES

Price Policies in Egypt

5.1 General overview: Price relationships in Egypt have become significantly distorted over the last fifteen years as prices for many commodities have been held at artificially low levels to protect consumers. The effects of these artificial prices ripple through the economy, impacting with differential force at numerous points. The retail prices of basic foods and other essential commodities are controlled and for certain items (e.g. rice) a rationed amount is available at the controlled price while additional quantities may be purchased at a free market price. Bread of a standard type is available in unlimited quantities at a strictly controlled price, while other "fancy" varieties are uncontrolled. Fruits and vegetables are subject to nominal retail price control, but it is not strictly enforced.

5.2 Farmgate prices for certain major crops have been controlled at levels generally well below the free-market price. Producers are required to surrender specified portions of their production of some major farm products to the Government, while remaining free to dispose of the balance at free-market prices. Cotton, on the other hand, has been subject to acreage quotas, and the entire production must be delivered to the Government at controlled prices substantially below world market levels. In 1979, official prices for most of the controlled crops were raised by approximately 30 percent, after being held constant for three years. Subsequently the farmgate price of wheat was released from control, but the market price remains depressed because of the effect of the subsidized price for flour and bread at the retail level. The Government also subsidizes the prices of farm inputs such as fertilizer, pesticides and seeds, thus partly offsetting the effect of controlled prices for farm products. These policies impose a substantial burden on the Government budget to finance the subsidies.

5.3 Various other commodities and services are also priced artificially. Prices of electric power and petroleum products, in particular, have been kept low despite

the worldwide increase in energy cost. These prices represent major subsidies to consumers, industry and agriculture, and have increasingly significant effects as the spread between financial and economic prices has increased. Diesel oil presently sells for only 16.9 percent of its economic price (Table 5.1). The average 1978 price for electric power of 1.5 pt/KWh was only 37.5 percent of its economic price, and the difference is steadily widening as world prices of fuel oil and gas move up rapidly. Industry is the largest electric power consuming sector, and the subsidy represented by the low cost of power has very broad significance on price levels throughout the economy.

5.4 Agriculture uses less power and its consumption is expected to grow less rapidly than that of industry. Nevertheless, the rapid rise in the economic price of energy has a special significance for the economics of reclamation wherever substantial water lifting is involved. The price of petroleum on the world market has risen in real terms by a factor of 3.5 since Egypt undertook major reclamation expansion 25 years ago. Electric power has not risen by the same factor, since the average unit cost of power was reduced in the sixties by the coming on stream of the two hydro installations at the Aswan Dam and the High Dam. The average economic price of electric power is now increasing, however, as additions to generating capacity in the current period are based on oil and gas, the world prices of which are rising rapidly. The artificially-repressed domestic prices of electric power and petroleum products have tended to mask the rapidly rising economic costs of pumping irrigation water to highland reclamation schemes. This has become a significant cost element for the operation of such projects, with a major impact on their feasibility.

5.5 Farm products: Prices of farm products have been subject to government controls over the past 15 years. These controls have been supplemented by market quotas for "main and essential" commodities including wheat, rice, fava beans, lentils, peanuts, sesame, onions and sugarcane. Generally the quotas have not been endorsed for lentils, peanuts and onions. Quotas for wheat were waived early in 1979. However, these restrictions have not applied to New Lands.

5.6 The other major component of the farm product pricing policies pursued by the Government of Egypt, namely the regulation and subsidy of farm product prices at the consumer level, has a more sweeping impact. The result is that for most major internationally-traded commodities, even free-market prices are substant all low world market levels. Farmgate prices for certain key commodities are

shown in Table 5.2. For major cereal crops the financial prices received by the farmers are in the range of 43-62 percent of the estimated international farmgate price. The wheat price is particularly low at 43 percent of the shadow price, though this is slightly misleading because of the substantial value which may be imputed to straw used as roughage for animals and regarded by smallholders as particularly valuable. (This stems from the absence of control of beef prices in a strong market). The low financial prices for grains are indicative of the total effect of government farm price policies. The effect is to encourage the production of more remunerative crops, such as citrus, vegetables and berseem, which compete with wheat, barley, maize, oilseeds and cotton.

5.7 Broadbeans are among the few pulses in which there is sufficient trade to obtain a representative international farmgate price. In that case, the internal financial price is more nearly aligned with world market levels; the financial price is 94.7 percent of the shadow price. Financial returns on the production of beans are therefore substantially more representative of their economic value to Egypt than in the case of cereals. Peanut prices on the domestic market are equivalent to only two-thirds of their shadow prices. The GOE has been giving considerable encouragement to the production of soybeans (even allowing their cultivation to substitute for fulfillment of cotton quotas). The price of soybeans on the local market is nearly 94 percent of the shadow price. Their comparatively low yield (and low proportion of oil to meal) make them a somewhat questionable product in Egypt's overall cropping pattern- they are also less well adapted to New Lands than other oil crops.

5.8 Fertilizer and other inputs: As a part of its larger policy of subsidy for farm inputs and consumer food prices, the GOE has held the prices of fertilizer, pesticides, seed, credit and other farm inputs fixed substantially below world market levels. Farmers have therefore enjoyed a subsidy of significant proportions in using these products. Allocations are made to farmers through the co-ops at predetermined levels related to the production of controlled price crops. Farmers, however, often apply some or all of the fertilizer to crops, the prices of which are not controlled or influenced by government action, because of the larger return obtained.

5.9 Tables 5.3 and 5.4 show the relationship between the economic and financial prices of the major nutrients in the various forms of greatest significance to Egyptian farmers. The current financial prices of the nutrients N, P, and K are respectively 40, 50 and 50 percent of the

economic farmgate prices. These very significant differences illustrate the substantial cost reductions provided to farmers by the subsidy program. Because of the proprietary nature and wide variety of products used it is not possible to provide a precise picture of the degree of subsidy afforded for the pesticides, fungicides, etc. The subsidy, however, is significant. Seeds for certain crops are also subsidized.

5.10 Credit is provided to farmers at well below the opportunity cost of money, estimated at 15 percent. Farm credit is made available at rates of three to six percent, a considerable subsidy.

5.11 Agricultural machinery and equipment prices from a number of sources were reviewed. It appears that U.S. prices may be somewhat higher than European prices. Freight rates are also higher on the average, but vary widely. After a review of the machinery prices used in the ULG West Nubariyah report (which include both U.S. and European source items) it was concluded that they are consistent and representative. If equipment were all from the U.S., prices might be somewhat higher (possibly 20-25 percent overall on a CIF basis), but as an average of costs which might be incurred on New Lands' projects in Egypt, the ULG prices are considered a sound basis for estimates and have therefore been adopted for the study (Table 5.5).

5.12 Most agricultural equipment and machinery, including irrigation pumps, are either duty-free or subject to nominal (two percent ad valorem) duties. Early in 1979 all duties on agricultural equipment were suspended. Therefore, for purposes of the analysis financial and economic prices of such equipment were considered equal.

5.13 Construction costs: Economic construction costs were taken as equal to financial construction costs. This implies an understatement of economic construction costs, since certain construction inputs (iron, cement, fuel) are subsidized. However, the magnitude of this understatement could not be ascertained with precision.

5.14 Labor costs: Financial wage rates in Egypt for unskilled labor are highly variable, depending on a number of factors. Because the seasonal demand reaches a peak in May-July and again in October, wages for casual labor during those periods rise to a level of approximately LE 1.50 per day in the Delta. At other times there is substantial underemployment and rates drop to levels of 60-70 piasters per day. In Tahaddi, graduates have experienced great difficulty in attracting needed casual labor at peak periods when LE 1.50 has been offered.

Substantial cost is incurred by the employers in trips to the Old Lands to recruit and transport workers in Tahaddi. Even in periods of less heavy demand when cash wages are about LE 1.10 per day, additional incentives in the form of cigarettes, tea and meals are offered to attract workers to this area which they consider remote and harsh. Daily wages for long-term laborers on the graduates' farms are approximately LE 1.10 in Tahaddi; approximately LE 0.65 (plus food and lodging) are paid by the state farm in nearby South Tahrir.

5.15 It is tempting to adopt a shadow price of zero for unskilled labor in Egypt, as some analysts have done, because the country has been a labor-surplus economy. The argument has been that there is virtually no cost to the economy for withdrawing unskilled labor from existing employment. In fact, however, the difficulty experienced by state farms and private farms in attracting labor in and outside peak periods argues against this viewpoint. In addition, another factor has emerged in recent years in the form of employment opportunities even for unskilled workers outside Egypt in the oil-producing and other neighboring countries. A shadow wage rate of zero is therefore not justified. We have adopted the going financial price for unskilled labor (1.10 LE/day) as the shadow price. We have also adopted the going wages for skilled labor as the shadow price for the same reasons.

The Cost of Water

5.16 The cost of water in Egypt is currently being intensively examined for the Ministry of Irrigation under the UNDP/IBRD Master Water Plan project. The project has not yet carried its analysis far enough to reach a definitive conclusion on the cost of water. Earlier analyses^{a/} had estimated the cost of water as low as 0.002 LE/m³, but this is not regarded by the Ministry as authoritative. The Ministry representatives, with whom discussions have been held, indicated that work under the Master Plan has proceeded far enough to conclude that the cost of water in Egypt is currently not less than 0.005 LE/m³. This estimate is based on the cost for operation, maintenance, and modernization of all the storage, control and main distribution facilities in the country. The requirements for replacement, improvement and modernization are still under review. Some are more urgent than others. Those already identified as most urgent have an estimated cost for construction alone (excluding design, supervision and the costs of operation and maintenance during construction) of LE 250 million. These known requirements give a firm

a/ Wastewater Master Plan for Alexandria: Study for Reuse of Wastewater for Irrigation, Bailey, 1978

basis for a cost of at least 0.005 LE/m³ for water in Egypt. Further improvement work to be accomplished in later periods remains to be precisely identified, but these and other costs may cause total water cost to rise to the level of 0.010 LE/m³ (LE 10.0/1000 m³).

5.17 Reports in Water News and other international publications also shed light on the costs of adding to the Nile River supply by works in the upper basin. According to these reports, the costs being incurred in the construction of the Jonglei Canal are higher than anticipated. They foreshadow a cost for the additional supply of 0.0065 LE/m³ (LE 6.5/1000 m³).

5.18 From the above it is clear that the cost of water in Egypt cannot be less than 0.005 LE/m³. This figure has been adopted as the cost of water for the analyses in this study. Further study may show that the present cost is actually higher. Future water demands may be such as to raise the price imputed to water because of scarcity value. All evidence suggests that measures to save and/or add to the supply of water will not reduce its cost. On all counts, then, the cost of water of 0.005 LE/m³ used herein is a conservative estimate.

5.19 Beyond the cost of water as a commodity there is a need to be aware of the cost of delivering and applying water to the individual project and/or user. In the case of reclaimed lands, this cost may be quite high. The cost of lifting water for delivery to highland reclamation projects is a major expense. Water application, particularly under pressure for sprinkler systems, signifies an additional cost, and there is also a cost for drainage and removal of water to the point of ultimate disposal. All of these factors must be considered in the economic analysis, and added to the cost of water as a commodity.

The Price of Electrical Energy as a Factor in Reclamation

5.20 For many years the GOE has pursued a policy of holding the price at which electrical energy is sold at a figure substantially below cost. The average billing rate of the Egyptian Electricity Authority for energy increased from 0.9 to 1.5 pt per KWH between 1975 and 1978. Nevertheless the rates remained below the cost of energy which was calculated to be 3.0 pt/KWH in the latter year. The economic price of electrical energy in 1978 was estimated, however, to be 4.0 pt/KWH. ^{b/} The spread between

b/ Power Sector Survey, Diagnostic Report, Phase I, Sanderson and Porter, 1976; and Hunting Technical Services Report No. 4, Alternative Strategies and Site Selection, July 1979, p. 52

the billing rate on the one hand, and the cost of energy as well as its economic price on the other, are accounted for by the following major factors:

- (a) The valuation of existing plant of the Electricity Authority used as a rate base dramatically understates its current replacement cost.
- (b) Fuel was sold to the Authority in 1978 at a price of LE 7.6 per MT, compared to its international price at that time of 49 LE/MT.
- (c) The return on invested capital has been about 3 percent, compared to the target rate of 9 percent set by the IBRD for determining future billings and to the opportunity cost of capital in Egypt, normally considered to be 15 percent.
- (d) The marginal cost of additional power capacity in Egypt (including the required thermal capacity now under construction) will be substantially higher than in the past; no account has been taken of this factor in setting rates for energy.

5.21 The cost of newly installed power capacity and particularly the price of petroleum has risen sharply since the 1978 Sanderson and Porter Power Sector Survey. The mid-1979 economic cost of electricity based on a full price of US\$ 19 per barrel, is estimated as 5.0 pt/KwH (end-1979 fuel prices of US\$ 24 per barrel correspond to an energy cost of 6.0 pt/KwH). The calculations of the present report are based on the mid-1979 energy cost of 5.0 pt/KwH.

EGYPT NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

Prices of Petroleum Products

Table 5.1

<u>Commodity</u>	<u>Financial Price ^{a/}</u>			<u>Economic Price ^{b/}</u>			<u>World Price ^{c/}</u>			<u>Financial Price as Percent of World Price</u>
	<u>LE/ liter</u>	<u>Equivalent US cents/ US gal.</u>	<u>LE/ MT</u>	<u>LE/ liter</u>	<u>US cents/ US gal.</u>	<u>LE/ MT</u>	<u>Financial Price as Percent of Economic Price</u>	<u>US cents per US gal</u>	<u>LE/ MT</u>	
Diesel oil	0.025	13.2	29.00	0.148	78.4	171.75	16.9	66.5	142.72	20.3
Gasoline	0.11	58.3	148.64	0.151	80.0	204.34	72.8	71.8	179.43	82.8
Kerosene	0.025	13.2	29.80	0.141	74.7	177.68	17.7	67.7	157.38	18.9

a/ Price at pump in Egypt.

b/ Based on price charged by Egypt for crude oil sold on world market at \$26.00/bbl in mid-1979.

c/ Based on OPEC price at \$23.00/bbl in mid-1979.

EGYPT NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

Economic and Financial Prices of Selected Major Products

Table 5.2

(Prices per MT Current 1979)

	Wheat	Maize	Barley	Soybeans	Peanuts	Broad Beans
International price FAS source (US \$/MT)	\$185.60 ^{a/}	\$158.60 ^{b/}	\$153.80 ^{c/}	\$257.40 ^{d/}	\$543.00 ^{e/}	NA
Freight and insurance, US \$	25.00	30.00	25.00	30.00	30.00	-
CIF Alexandria, US \$	210.80	188.60	178.80	287.40	573.00	-
LE equivalent ^{f/}	LE147.60	LE132.00	LE125.20	LE201.20	LE401.10	LE140.00 ^{g/}
Port cost and transport, LE	12.00	12.00	12.00	12.00	12.00	12.00
Wholesale market price, LE	159.60	144.00	137.20	213.20	413.10	152.00
Less distribution/transport to point of sale ^{h/} , LE	13.00	12.20	11.90	15.70	25.65	12.60
<u>Producer (farmgate) economic price</u>	146.60	131.80	125.30	197.50	387.45	139.40
<u>Producer (farmgate) financial price, LE</u>	63.00 ^{i/}	82.0 ^{i/}	65.00 ^{i/}	184.90 ^{i/}	266.70 ^{k/}	132.00 ^{i/}
Financial as percentage of economic price	43.0	45.5	51.9	93.6	68.8	94.7

a/ Canadian No.1, Thunder Bay

b/ US No.2 Yellow FOB Gulf Ports

c/ Estimated on the basis of Hunting Report No.4

d/ US Source, CIF Rotterdam

e/ Any origin, shelled, CIF Rotterdam

f/ Lending, landing, debulking, storage, fees, internal transport included

g/ Current CIF price, Hunting, Vol.4 Table E-1

h/ 5% commission to distributor plus 5 piasters per ton/kilometer

i/ Hunting Report No.4, Table E-1, and US Agricultural Attache, Prices Received by Farmers for Selected Crops, 1970-1979, April 20, 1979

j/ ULG, West Nubariyah Extension, Vol. P 211 (adjusted to 1979 level by adding 7.5 percent)

k/ Controlled (fixed) price approximately equal to prevailing market price

EGYPT NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

Fertilizer - 1979 Current Prices

Table 5.3

	Ammonium Sulphate 20.6%	Triple Superphosphate 43%	Potassium Sulphate 48%	Urea 46%	Muriate of Potash (KCl) 60%
FOB at source, \$/MT		\$127.50 ^{a/}	\$159.50	\$159.50 ^{b/}	\$66.00 ^{c/}
Freight and insurance, \$/MT		\$ 25.50		\$ 31.90	\$16.50
CIF Alexandria, \$/MT		\$153.00		\$191.40	\$92.50
LE equivalent		107.10		134.00	64.75
Port handling, bagging, clearance & transport to port storage, LE/MT		8.60		7.00	11.70
Value in port storage, LE/MT		115.70		141.00	76.45
Internal transport & distribution, LE/MT		21.80		25.40	15.25
Economic farmgate price, LE/MT	71.50 ^{d/}	137.50	68.15 ^{d/}	166.40	92.70
Economic price per unit (kg) of nutrient, LE	0.35	0.32	0.14	0.36	0.15
Financial farmgate price, LE/MT	31.40	69.00	34.30	66.90	N.A.
Financial price per unit (kg) of nutrient, LE	0.15	0.16	0.07	0.15	0.057 ^{e/}

^{a/} TSP, bulk FOB Florida

^{b/} Urea, bagged, FOB N.W. Europe

^{c/} KCl, bulk, FOB Vancouver

^{d/} Source: West Nubariya Extension, ULC Consultants (adjusted to mid-1979 prices)

^{e/} Based on potassium sulphate price at 34.30 LE/MT as sold in Egypt and as reported by Hunting Technical Services Ltd, Vol. IV, Table E-1

EGYPT NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

Long-Term Farmgate Fertilizer Prices ^{a/}

Table 5.4

	<u>Ammonium Sulphate 20.6%</u>	<u>Triple Superphosphate 43%</u>	<u>Potassium Sulphate 48%</u>	<u>Urea 46%</u>	<u>Muriate of Potash (KCl) 60%</u>
Financial price 1979, LE/MT	31.40	69.00	34.30	66.90	N.A.
LE per kg nutrient	0.15	0.16	0.07	0.15	0.057
Economic price 1979, LE/MT	71.50	137.50	68.15	160.40	92.70
LE per kg nutrient	0.35	0.32	0.14	0.34	0.15
Economic 1985 in 1979 LE/MT constant prices	90.70	195.50	94.70	198.70 ^{b/}	102.83
LE per kg nutrient	0.44	0.47	0.20	0.43	0.17
Economic 1990 in 1979 LE/MT, constant prices	90.70	195.50	107.00	198.70 ^{b/}	110.95
LE per kg nutrient	0.44	0.47	0.22	0.43	0.18

^{a/} Economic prices projected on basis of IBRD data as set forth in Price Prospects for Major Primary Commodities, June 1978, and Hunting Report No. 4 Alternative Strategies and Site Selection Criteria.

^{b/} Prices of urea are affected by price changes of petroleum and natural gas. A 20% real increase in the price of gas could raise the price of urea by LE 7.0 per ton, or LE 0.02 per kg of nitrogen.

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 6

PERSPECTIVES FOR FRUIT AND VEGETABLE EXPORTS

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
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WORKING PAPER NO. 6

PERSPECTIVES FOR FRUIT AND VEGETABLE EXPORTS

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WORKING PAPER NO. 6

PERSPECTIVES FOR FRUIT AND VEGETABLE EXPORTS

Summary

6.1 Egypt has long been engaged in the export of fruit and vegetables. Oranges rank first, potatoes, onions and garlic follow, and fresh vegetables as well as herbs and flowers are of growing importance. Total fruit and vegetable exports are approximately 500,000 tons annually but quantities of the several fruit and vegetable commodities vary from year to year. Total exports were relatively stable from 1973 to 1977. The exportation of Egypt's fruit and vegetables is a function of the government, and two government-owned and controlled companies handle the bulk of the exports. Export prices are fixed and participation by the private sector is limited.

6.2 Oranges are exported primarily to Eastern Europe, with the remainder going to Western Europe and Arab countries. Eastern European sales are generally under trade agreement, and quality is not a critical factor. The quantity of oranges exported is determined largely by governmental authorities. Western European markets are highly competitive, demand excellent quality, and sales are made on consignment. The major constraint to broadening the market in Western Europe is the inability to provide consistent supplies of high-quality oranges which can meet the competition of other orange-producing countries.

6.3 Potato, onion and garlic exports are shared with the private sector. Most potatoes go to Western Europe markets, largely on consignment. Onions and garlic are sold mainly to Eastern Europe under trade arrangements. The major constraint to increasing exports of these commodities is the inability to produce adequate supplies of export-quality merchandise. Fresh vegetable exports are sporadic, with large fluctuations in the quantities of produce. Quality is again one of the drawbacks. The Egyptian market is large and local needs come first. Lack of cold storage and the considerable delays at airports and seaports are reported to disrupt export trade.

6.4 Under present conditions in Egypt there is little prospect of substantially increasing exports of fresh fruit and vegetables, especially to Western Europe. To achieve an increase it will be necessary to stimulate production of quality produce, improve transportation, both inland and ocean-going, revitalize services at sea-ports and airports, and provide cold storage and adequate container facilities. Communications should be improved and marketing costs reduced. Greater participation in export operations by the private sector is recommended. Exports to Eastern Europe and the Arab countries are bound up with governmental decisions and controls. In spite of such limitations, these areas may offer the best opportunity for market expansion.

6.5 The agricultural policies of the Government of Egypt (GOE) are directed toward three major objectives:

- (a) produce much of the domestic food supply,
- (b) generate foreign exchange, and
- (c) employ local labor.

6.6 To accomplish these objectives, the Ministry of Agriculture keeps a tight rein over all crop production by regulating the cropping patterns of all farmers, making inputs available at subsidized prices, encouraging certain mechanization, and procuring certain crops at established prices. More than 60 percent of the total crop area is planted to government-regulated crops.

6.7 The marketing of agricultural commodities is also largely state-controlled. Farmers are required to sell certain quotas of basic crops, such as cotton and wheat to government agencies at fixed prices, which may be below world market prices. On the other hand, prices of fruit and vegetables are not effectively controlled except for export. Areas planted to these crops are increasing. Prices for fruit and vegetables are not fixed at the farm. The system of farmer cooperatives serves as the principal government marketing agency, along with public sector marketing firms organized for this purpose.

6.8 Fruit and vegetable production is an important industry in Egypt. Most of the production is in the Delta but some crops, particularly onions, are grown in Upper Egypt. Fruit production covers 330,000 feddans, whereas vegetables account for over one million feddans (Table 6.1). The area planted to fruit and vegetable crops has been gradually increasing. There is no governmental control over acreage allocated to these crops, and no effective price controls are exercised. Fruit and

vegetables are mostly grown for domestic consumption, production is scattered and consists of small plots, usually less than a feddan each. The bulk of the crop is consumed in Egypt and the remainder exported. While some good quality crops are grown, much is of low quality and there is considerable waste.

6.9 Total exports of fruit and vegetable crops have not changed to any significant degree during the five years 1973-77, and total about 500,000 tons per year. There has been a great deal of variation in the exports of individual crops, depending primarily on the amount produced. Oranges, potatoes, onions and garlic represent the standard export items whereas tomatoes, watermelons and green beans are gaining in importance. Herbs or spice crops are also gradually increasing in importance. More than twenty different crops are exported during a single season (Table 6.2).

6.10 Domestic food requirements: The population of Egypt is 42,000,000 people and increasing at the rate of 1.25 million per year. It is the policy of the government to supply adequate food for all the people. A number of foods are subsidized and sold at reduced prices. Domestic supplies of fruit and vegetables are marketed through two large wholesale markets and dozens of smaller markets. Retail stores and roadside stands are located everywhere. Prices for fruit and vegetables in domestic markets are good, and exports must compete with local demands for fruit and vegetable crops (Figure I).

Orange Exports

6.11 The production of oranges in Egypt has been developed over a long period of time. There are old groves and many recent plantings. Overall citrus fruit production area in 1978-1979 was 188,000 feddans, an increase of three percent from the preceding year. According to Egyptian Government statistics, the production of oranges in 1978-1979 was 842,679 MT, Mandarins 85,176 MT, and limes 58,025 MT, all well above the previous year's production. The average yield of oranges was seven MT per feddan. The 1979-1980 forecast for orange production is 890,000 MT.

6.12 The export season begins in late November and continues until the following April, i.e. about 16 to 17 weeks.

6.13 Orange exports have been declining, from the all-time high of 246,000 MT in 1975-1976 to 175,000 MT in 1977, and to 100,400 MR in 1978-1979 (Table 6.3).

The bulk of this quantity went to Eastern Europe and the USSR (66 percent), while only six percent was exported to Western Europe. The remaining 26 percent was exported to the Arab countries, primarily Saudi Arabia and Yemen, whereas Singapore and Hong Kong purchased two percent.

6.14 Egypt has two state-owned processing plants, which together processed approximately 5000 tons of citrus from the 1978-1979 crop. They also process tomato juice and paste and mango juice. Only single-strength citrus and mango juice are produced. These are marketed domestically and in Arab markets, primarily Saudi Arabia. The tin cans are imported.

Orange Production Projections

6.15 The production of oranges throughout the world and projections to 1985 have been published in 1979 by the FAO (Table 6.4). The FAO reported world orange production in 1975 as 32,407,000 MT, of which 7,575,000 MT were exported to international markets. The FAO projects that in 1985 world orange production will be about 43,000,000 MT, i.e. a 30 percent increase in ten years. Moreover, the FAO predicts that in 1985 approximately 10,000,000 MT of oranges will be available for export in world trade, a 33 percent increase in ten years (Table 6.5). On the other hand, the demand for oranges in international markets in 1985 is projected to be in the range of 8,795,000 to 10,530,000 MT. On the basis of these projections, there could be in 1985 up to 1,260,000 MT of oranges available for export in excess of demand.

6.16 The increase in exports is expected to come from five developing countries, viz. Brazil, Cuba, Egypt, Morocco and Cyprus. The developed countries are expected to have less oranges available for the international market. Brazilian fresh oranges are marketed in the spring and summer, but most of their crop is processed into frozen concentrate. The concentrate is exported to Western Europe and the U.S.

6.17 The major competition for fresh Egyptian oranges will come from the Mediterranean countries and Cuba. The FAO reports that Cuban orange production in 1975 was 115,000 MT, and is expected to increase to 1,500,000 to 1,750,000 MT in 1985. Cuba has reportedly planted 250,000 hectares of citrus fruit in the past decade. It is further reported that most Cuban oranges are marketed in the USSR.

6.18 If the FAO projections materialize, it is obvious that competition in the international orange market will

greatly increase. The tremendous new production in Cuba will probably be marketed in the USSR and/or other Eastern European countries. This could increase orange consumption in those countries or reduce the market for other oranges, including those from Egypt. Competition from Cyprus, Morocco and Israel must also be recognized. All of these countries have well-established orange marketing systems. All operate under government-sponsored marketing boards; each has a single established label supported by extensive advertising and promotion. Oranges from these countries are marketed at the same time as those from Egypt and over a longer season. They are of high quality and packing, have a good reputation in the European markets, and are on the market consistently through the season.

6.19 Perhaps the most formidable factor affecting the future market for oranges in Western Europe is the composition of the EEC. Greece has now been admitted to the EEC and Spain and Portugal are expected to be admitted by 1981. Spain is now the number one supplier of oranges to the EEC during the fall and winter seasons. Once Spain becomes a member of the EEC there will be no tariff on the movement of Spanish or Greek oranges within the EEC and no requirement to comply with the reference price system of the EEC. Tariffs are not a serious constraint for Egyptian oranges to enter the EEC. In a bilateral trade agreement between the EEC and Egypt, the common External Tariff of 20 percent ad valorem is reduced by 60 percent. Oranges from Morocco, Israel and Cyprus enter under a similar arrangement. While tariffs are nominal, the entry of all non-EEC oranges must comply with the reference price system.

6.20 The exportation of fruit and vegetables from Egypt is entirely controlled by the Egyptian Government. All export prices are fixed. The price level of each commodity is determined by a committee of fruit and vegetable exporters. This committee meets every Tuesday and Saturday and determines or adjusts the export price of each commodity, to be effective for the subsequent period. This is an FOB price at port of export. Once the price is agreed upon by the exporters it is expected to be adhered to, but there is said to be no enforcement of this rule. The price is based upon the supply and demand situation existing at the time. The price is fixed at a level which includes all incidental costs and commissions, formal or informal. The GOE levies a tax of two percent of the total sales price. Retail prices of fruit and vegetables are also fixed, but largely ignored.

6.21 The GOE has established two exporting companies which are responsible for the bulk of the exportation of fresh fruit and vegetables. These are the El Wadi Company and the Nile Company. Both are publicly owned and controlled. Any profits revert to the government. The El Wadi Company has a monopoly on the export of citrus fruit and also exports other fruit, watermelon and sweet potatoes (Table 6.6). The Nile Company has a monopoly on the export of potatoes, and also exports a variety of fresh vegetables. The El Wadi Company maintains agents in Rotterdam and Singapore who handle any buyer complaints and also seek new market outlets for Egyptian commodities.

6.22 More recently the private sector has succeeded in becoming involved in fruit exporting. A number of private firms are reportedly taking part in export marketing. They purchase citrus fruit directly from the producer. The fruit is picked by the producer and packed by hand. It is accumulated locally, held without cold storage and transported to the port. It is reported, however, that establishing a private exporting firm is extremely difficult. Financing is costly and buyers are hard to find. Moreover, any such firm must get approval of the Egyptian Government to engage in export operations. Apparently there is an informal allocation of a percentage of specified commodities which are available for private export. This varies with the commodity but may be as high as 60 percent.

6.23 Fresh oranges represent the largest single item of fruit and vegetables exported. Most of the exports go to Eastern Europe; the buyer is the government of the country concerned. The USSR is the largest buyer. Each season, the two governments agree on the terms of sale of oranges to the USSR and a drawing account is established at the bank. Each shipment is charged to this account and the exporter receives payment in Egyptian Pounds for 90 percent of the shipment. The remaining ten percent is not paid until the oranges arrive in the USSR and are accepted. All sales to the USSR are made FOB port of export, and the USSR provides transportation in its own vessels. All shipments go to Odessa. It is reported that arguments on quality, etc. occur regarding every shipment, making it necessary for the El Wadi Company to send a representative to Odessa with every shipment in order to agree on a settlement. Other sales to Eastern Europe are made on an FOB basis, with the buyer taking delivery at port of export. These sales are reportedly in convertible currency. Hungary and Roumania are important markets. The markets in Eastern Europe will accept any quality of oranges, providing the price meets

their approval. Oranges packed for Eastern Europe are of Egyptian No. 2 grade, which is lower than EEC class two. These No. 2 grade oranges are washed, packed and labeled in the same manner as higher-grade export oranges. All sales are FOB, with no commissions or terminal charges.

6.24 The Arab countries, particularly Saudi Arabia and North Yemen are good markets for Egyptian oranges. These markets, as well as Singapore and Hong Kong, demand first quality fruit. They purchase on an FOB basis and the buyer takes delivery at the Port of Suez or Port Said. Sales are for a fixed price and payment is in convertible currency. These markets take about 30,000 tons of oranges per year (Table 6.7).

6.25 Western Europe is also an important market for Egyptian oranges, particularly the United Kingdom, Germany and the Netherlands. These markets demand first quality fruit, and pay in convertible funds. Purchases are generally not on an FOB basis; consequently, most Egyptian oranges are consigned and are sold at auction. In Switzerland, Austria and other small markets, oranges are sold C & F port of Trieste. All sales of Egyptian oranges in Western Europe encounter stiff competition from other orange-producing countries, particularly Spain, Morocco and Israel. Net returns received for Egyptian oranges sold in Western European markets are lower than for those sold in other markets. Moreover, there is more financial risk involved, due to the use of consignment sale methods (Table 6.8).

6.26 Preparation of commodities for the export market presents many complications. The El Wadi Company (controlled by the Egyptian Government) owns and controls all of the ten packing stations for citrus fruits. These orange packing stations are relatively modern with standard grading, washing, waxing, and sizing equipment. Oranges are picked and transported by the producer, in plastic field boxes provided by the packing station. Producers are not required to sell to El Wadi and many do not. They may sell to the local wholesale markets in Cairo or Alexandria, to processors or to others who sell at roadside or at small markets. Many producers are informally affiliated with packing stations which provide advice and counsel during the growing season. At harvest time the packing stations draw up schedules for the picking. Each producer's oranges are packed separately and he is paid according to quality delivered. The oranges are washed, sized and waxed mechanically, using SJPP and TBZ in the wash water. Grading and packing are performed by women and young girls, who are paid LE 1.25 per

eight-hour day. Oranges are hand packed in wood or fiber 18 kg cartons, with alternate rows wrapped in tissue impregnated with diphenal. The oranges are not degreened and may contain 30 to 70 percent green skin. The wood cartons are imported from Roumania and the fiber cartons from Spain. All export oranges are labeled with the Nefertiti label and divided into Grade I and Grade II. These are Egyptian grades and are lower than EEC Class I and Class II. Government inspectors check the grades on the grading tables. Each carton is marked with the variety and the number of oranges in the carton, as well as the grade. There are no cold storage facilities.

6.27 After the oranges are packed they are transported to Alexandria, Suez or Port Said in non-refrigerated trucks. These trucks may be owned or hired by the packing station. It is reported that the cost from the Cairo area to any port is LE 5 per ton. Once the product reaches the port it must undergo another government inspection for grade and quality. Fruit and vegetables may not be imported into the European Economic Community unless they meet the requirements of Class II established by the EEC. In addition, the cargo must undergo inspection to insure that the plant quarantine requirements of the importing country are met. If fumigation is required by the importing country, the cargo must be properly fumigated. Commodities are also inspected for pesticide residues to ensure compliance with all regulations. All inspection costs must be paid by the exporter and are considered when fixing the export price.

6.28 Shipments to port are scheduled to coincide with the loading of the vessel. It is difficult to assemble and load a large cargo without some delay. It is reported that there are no cold storage facilities at any of the sea ports, even though the loading and clearing may require several days. Government red tape at the ports is said to be one of the principal deterrents to exports.

6.29 In Egypt, there is a generally accepted, informal tariff called "baksheesh," which is expected everywhere. It is reported that a gratuity must be paid to the truck driver to ensure that oranges move from packing station to port without delay. The port personnel also require a payment to ensure that the cargo moves through the port. The longshoremen must receive something to encourage prompt and proper loading, and the seamen must have gratuities to look after the cargo en route. The ship's captain should not be overlooked either. The total amount of these payments is unknown, but they are real and omnipotent.

Conclusions

6.30 Shortcomings in the export of Egyptian oranges include the following:

- (a) The season is short (16 to 17 weeks).
- (b) Quality is not the best, when compared with competing fruit.
- (c) Navels, Valencias and Shamoutis are good varieties, but the Baladi is a juice orange and is not well-suited for sale as a fresh orange.
- (d) The marketing season coincides with those of other Mediterranean countries.
- (e) While Egypt uses a standard label, there is no advertising or trade promotion.
- (f) Egyptian oranges are, for the most part, exported by the government; it has no overseas marketing organization and relies heavily on consignment when selling in Western Europe.
- (g) The Egyptian market consumes 80 percent of the orange crop. Government policy is directed to feeding the people, and exports are limited if the product is needed in the local market.

6.31 Under the conditions outlined above, the following course of action is proposed:

- (a) Push the Eastern European market to the limit. Consumption of oranges there is less than two kg per capita per year. Sales and terms of sale in this area are largely political decisions and may be influenced by many factors. Returns for oranges sold in this area are good.
- (b) Expand the Arab and Far Eastern market to the maximum. This is a good market, even though there is some competition. Egypt has the advantage of location and the familiarity with the customs and habits of the Arab world. Trade visits and some promotion might help. Terms of sales of oranges to the Arab world are simpler than those for other buyers, and returns are good.

- (c) The Western European market presents the greatest challenge. There is no easy way to compete with the organized overseas marketing organizations of Morocco, Israel and Cyprus, to say nothing of Spain, but there are some possibilities.

The Current Situation of Vegetable Exports

Potatoes

6.32 Potatoes are grown throughout Egypt, and are ordinarily planted in rotation with other crops. Two crops are grown per year, a fall crop planted in September and a summer crop planted in February. Total area in 1978 was 130,000 feddans, which produced 772,000 MT of potatoes, as compared with 960,000 MT in 1977. Most of the seed is imported from the U.K. or the Netherlands. The Alfa and King Edward varieties are commonly grown; these are round white potatoes. Some of the summer crop is used as seed for the fall crop. Losses are heavy, primarily due to the tuber moth which causes ten to 15 percent loss of crop.

6.33 The exportation of potatoes is divided between the El Nile Company, owned and controlled by the government, and private exporters who handle more than one-half of the potato exports.

6.34 Potatoes for export are dug by machine or by hand and are transported to the port of export, where grading stations are maintained. Two grades are used, but only first-quality potatoes are exported. Winter-crop potatoes are packed for export in 22.5 kg burlap or plastic bags. Summer potatoes for export are packed in wooden boxes with peat moss for protection. Total potato exports in 1977 were 166,000 tons (Table 6.9), but in 1978 only 97,000 MT were exported. Shipments are by sea with refrigeration in summer and ventilation in winter. Some charter ships are used. Potatoes are marketed primarily in the U.K., France and the Netherlands, but important quantities go to Eastern Europe and the Arab countries. Exports are made from January to June. Sales are made on an FOB basis to Western Europe if possible, but many shipments are consigned. Sales to Eastern Europe are sometimes under an agreement, but in a few cases hard-currency sales are negotiated. The El Nile Company shipments go largely to Italy and the Arab countries.

6.35 The importing countries have quarantine regulations to guard against potato diseases. These are well known to the exporters and apparently cause no great difficulty. Also, consumer preferences must be recognized.

The U.K. prefers white-flesh potatoes, whereas the Netherlands and Central Europe are accustomed to yellow-flesh potatoes. Eastern European countries are heavy potato consumers, and quality is not of major importance.

6.36 Egypt exports a sizable tonnage of potatoes to Eastern Europe under bilateral trade arrangements. While the quantity and terms of sale are made by governmental authority, this area is worth exploiting, especially as an outlet for lower-quality potatoes. The Arab countries also represent a good market for Egyptian potatoes, and in 1977 purchased almost as much as Eastern Europe. This area demands good quality potatoes. Purchases are on an FOB basis and delivery is accepted at port of export, with few formalities involved.

6.37 The domestic market consumes most of the Egyptian potato crop, as potatoes represent an important item in the local diet. There is almost no grading of potatoes for domestic consumption, and they are sold in bulk or in various types of containers. While maximum prices at the wholesale and retail levels are established, there appears to be very little adherence to such prices.

6.38 Exports have grown slightly in the five years from 1973 to 1977, but fluctuations are great. Delays in transport, especially in ports of export and port clearances are said to be constant and annoying. In addition, there exists competition (especially from Cyprus and the Canary Islands) to sales in the European markets. While private exporters handle over one-half of potato exports, all transactions must have government approval. Government inspection for quality is mandatory and the cost is charged to the exporter. However, perhaps the largest constraint to increasing potato exports is the inability to produce and pack adequate quantities of export-quality potatoes.

Onions and Garlic

6.39 Onions are grown in Egypt in three different seasons: winter, summer and Nili (fall). The total area planted in 1978 was 124,000 feddans, 16 percent less than 1977. The main onion production area is in Upper Egypt. Onions are often interplanted with other crops. Production problems have increased due to high water table and drainage problems resulting from construction of the High Dam. Onions suffer also from the white rot, a soil-borne disease. Garlic was grown on 26,000 feddans in 1978, a reduction of 42 percent from 1977. Garlic is grown in all agricultural producing areas of Egypt.

6.40 Production: The onion crop in 1978 was 599,000 MT, down from 723,000 MT in 1977. Garlic production in 1978 was 155,000 MT, down from 206,000 MT produced in 1977. However, the year 1978 was an unusually poor one for onions and garlic and more normal production is expected in 1979. Most of the onion and garlic production is absorbed in fresh form by the local market.

6.41 Exports of fresh onions were down to 57,000 MT in 1978 from 81,000 MT in 1977 (Table 6.9) and a high of 105,000 MT in 1972. On the other hand, about 60,000 fresh-weight tons of onions were exported in dehydrated form in 1977, and the same quantity in 1978. Fresh garlic exports totaled 19,000 MT in 1978, compared with 22,000 MT in 1977. Dehydrated garlic exports were 2,146 fresh-weight tons in 1978 and 753 MT in 1977. Two-thirds of the fresh garlic exports were shipped to Eastern Europe, with the remainder about equally divided between Arab countries and Western Europe. The dehydrated products are marketed primarily in Western Europe.

6.42 The export procedure for onions is different than the one utilized for other fruit and vegetables. The onions grown in Upper Egypt are purchased from growers by the local governorate and transported to the port of export. The exporter purchases the onions from the governorate. The harvesting and curing is performed by the grower. Transport (which may total 500 km or more) is by rail or truck. Grading and packing takes place at the packing stations in the port area. Government inspection is required, and only first-quality onions are exported.

6.43 Export sales of fresh onions are oriented mostly to Eastern Europe, with Western Europe a close second and smaller quantities going to Arab countries. The onion export market has been based on providing a hard, pungent, long-keeping onion. The Giza 6 variety is well-known in Europe and has an excellent reputation. All export sales of onions, except those to Eastern Europe, must be on an FOB basis; no consignments are authorized by the government. Sales to USSR are under a bilateral agreement, whereas sales to Arab countries are FOB with payment in convertible currency. Reportedly there is no difficulty in finding markets for onion exports. The major problem is producing adequate quantities of export-quality onions.

Other Fresh Vegetable Crops

6.44 A wide range of fresh vegetable crops is grown in Egypt, mostly on small, scattered plots. Tomatoes

total of 4,000 tons of tomatoes were exported (Table 6.9), primarily to Eastern Europe (especially to Poland). Watermelon exports in 1977 amounted to over 26,000 MT, mainly to the Arab countries, with lesser amounts going to Western Europe. Exports of green beans to Western Europe are increasing, and in 1977 totaled 4500 MT. Sweet potatoes find good markets in Western Europe and the Arab countries; 2,300 MT were exported in 1977. Smaller quantities of other fresh vegetables are exported. Most vegetable exports are in the winter months (Table 6.9), Although watermelons are marketed from April until August.

6.48 Vegetables for export are sometimes grown from special seed which is used only for this purpose. The crops are hand-harvested and sorted or graded at the edge of the field. Tomatoes are stake-grown, and a packing station is located near Giza. Packed vegetables are trucked to the Cairo Airport, where inspection takes place. All fresh vegetables are exported by air, including those to Eastern Europe. There are no storage facilities at the airport, and delays often occur. Charter cargo flights are used as well as regular cargo services. Damage or quality problems occur regularly. These are settled at the destination point by representatives of the Egyptian Commercial Office.

6.49 Fixed price vs. consignment: The bulk of fresh vegetable exporting is done by the El Nil Company, but there is considerable private-sector activity. The Government Board allocates the quantity between the public and private sectors. Fresh vegetables for export are sold mainly on an FOB basis at a fixed price, except to Eastern European countries. Buyers' resistance has sometimes developed to paying the prices fixed by the Board for fresh vegetables. Western European buyers, in particular, want the transaction on consignment, in order to avoid the risk of market fluctuations. Consignments are reportedly increasing, but there is stiff competition in Western European markets from produce coming from other countries. Some exporters suggest that in order to expand vegetable exports from Egypt to Western Europe, consignment selling will be necessary.

Herbs

6.50 The production of so-called medicinal herbs is a traditional part of Egyptian agriculture. Crushed spearmint and peppermint are of major importance; basil and marjoram are also significant items. Some fifteen different herbs or seeds are grown and exported (Table 6.10). Herb exports are year-round. Herbs are packed in 25 kg bags and sold to Western Europe and the U.S. Most

shipping is done by air. The private sector handles most of the herb exports. The major problem with this export item is assuring the purity of the product.

Ornamental Crops

6.51 The production and export of fresh-cut flowers and ornamental plants in Egypt is increasing. Some bulbs are imported from Holland and grown for export. Gladiolus, bird of paradise, iris and carnations are prominent. Sales are made FOB, packed in special cartons and transported by air, mainly to Western Europe and the Arab countries. Many are also sold to the USSR on agreement. There is heavy competition from the Canary Islands and Israel. Much of the business is in the private sector and could be increased if sales were made on consignment.

Perspectives for Vegetable Exports

6.52 The European Economic Community is the largest regional importer of fresh fruit and vegetables in the world; Germany, France and the U.K. are the largest single importers. Consumption patterns in Western Europe are generally stable. The EEC accounts for about 55 percent of world fruit imports and for 60 percent of world vegetable imports. Bananas, apples and oranges represent two-thirds of the fruit imports, while potatoes, onions and tomatoes represent more than one-half of the vegetable imports. In 1973 the Mediterranean countries (Egypt, Cyprus, Greece, Turkey, Spain, Morocco, Israel) supplied 21 percent by value of world trade in fruit and 11.6 percent by value of world trade in vegetables.

6.53 Smallest share of the EEC market: There has been little change in the consumption of fruit and vegetables in the EEC, and little change in imports. Moreover, there has been little change in the share of EEC fruit and vegetable imports supplied by the Mediterranean countries. In 1970 the Mediterranean countries supplied 37 percent of EEC fruit imports, and the same percentage in 1978. For vegetables, the share rose from 25 percent in 1970 to 29 percent in 1978. Among the Mediterranean countries, Spain is the largest fruit and vegetable supplier to the EEC and Egypt is the smallest.

Seasonality

6.54 Trade in fruit and vegetables is a seasonal activity. During the summer the EEC supplies practically all of its own needs except for citrus fruit and bananas. In the winter season the EEC imports more than half of

its fruit and vegetable requirements. Thus prospects for exports from Mediterranean countries to the EEC are practically limited to the winter season.

Tariffs and Trade Policy

6.55 Trade between the EEC and the Third World countries is governed primarily by the Common Agricultural Policy (CAP). The CAP is an elaborate price-regulating mechanism which protects the EEC agricultural sector. Domestic farm prices are supported at levels determined by EEC authorities. Imports are regulated by tariffs and a reference price system which is designed to guarantee supplies, yet maintain domestic prices. The CAP is not yet fully in effect for fruit and vegetables because of differences within the Community and highly fluctuating supplies and prices of fruit and vegetables.

6.56 The EEC has modified its restricted market access to some degree through trade agreements with individual countries. The EEC accords with Egypt in 1973 and 1977 were negotiated with a consideration to its competitive disadvantage vis-a-vis other Mediterranean countries, particularly Spain. Under these agreements, the Common External Tariff of 20 percent for oranges entering the EEC is reduced to eight percent for Egyptian oranges. The EEC has similarly granted tariff concessions to Israel and Morocco to improve their competitive position. With the entry of Greece, Spain and Portugal into the EEC, other changes may be in order.

6.57 The EEC policies and agreements have had diverse effects on the imports of horticultural commodities from Third World countries. The tariff concessions in the Mediterranean agreements are said to have been of marginal benefit, and have not resulted in an increased share of the EEC market for the Mediterranean region.

Other Competition

6.58 Third World countries have stepped up efforts to improve their position in the traditional EEC markets. The Southern Hemisphere countries have captured a good share of the EEC fruit market. Eastern European countries have increased their share of the EEC market for selected vegetables, despite the imposition of quotas. More recently, the Lome Convention has encourage the Asian, Carribbean and Pacific (ACP) countries to produce high-value fruit and vegetables for the EEC market. The Lome II Agreement, which becomes effective in March 1980, will offer further encouragement to the 57 countries covered by the ACP. The Lome Agreement undertakes to guarantee export earnings of

ACP countries for most agricultural commodities. Moreover, these countries have duty-free entry into the EEC and are not subject to the reference price system. These factors offset their higher transport costs. The Canary Islands, Tunisia and Algeria are also capable of providing additional competition.

Outlook for the EEC Market

6.59 The World Bank has published the results of an analysis of fruit and vegetable exports from the Mediterranean area to the EEC (Ref. 19). This study projects the market outlook for the 36 fruit and vegetables supplied to the EEC. It concludes that Mediterranean exports of fruit and vegetables to the EEC will decline between 1976 and 1985, even though EEC imports are expected to remain stable. Greater competition, coupled with stable European consumption, will make it difficult for the Mediterranean region to maintain its current market share.

6.60 According to the World Bank study, the outlook for increased exports of fruit and vegetables from Egypt to the EEC is not particularly optimistic. The increased use of consignment selling by Egyptian exporters is indicative of a reluctance on the part of European importers to risk FOB purchases of Egyptian fruit and vegetables. It should be noted that the FAO study of international trade in citrus fruit arrives at similar conclusions (para 6.14). As shown in Table 6.5, the FAO concludes that citrus supplies (excepting lemons and limes) will exceed the international market demand.

6.61 To help counteract this situation, Egyptian produce dispatched to western Europe should be of top quality, with excellent packaging, handling and storage and unnecessary delays in transit should be eliminated. Efforts should be directed to improved efficiencies in marketing as well as development of a coordinated market intelligence system. It will be important to know and understand day-to-day market fluctuations in the important markets.

Outlook for Eastern European Markets

6.62 Eastern European countries operate under centrally-planned economies. Government authorities control all decisions including the extent and composition of imported foods. For the most part, imports of so-called luxury foods, such as oranges and bananas, are very limited.

The annual per capita consumption of oranges in the USSR is less than two kg, as compared with the 7.7 kg world average. Eastern Europe produces very large quantities of potatoes, onions, cabbage and root crops. It is necessary for Eastern European countries to import some food commodities, especially food grains and feed grains. The extent of their imports of fruit and vegetables depends on the extent of the resources the government decides to allocate for purchase of such foods.

6.63 Egypt has turned more and more to Eastern European markets, especially the USSR (Table 6.11). Most of the Egyptian orange exports are sent to the Eastern Block, and it is also the most important market for onions, garlic and tomatoes. This market has possibilities for some further development through trade agreements.

Markets in the Arab Countries

6.64 Little empirical evidence is available about markets in the Arab world, their size, their methods of marketing and distribution, and their potential. It is known that population and food imports are increasing. These countries demand quality products and pay in convertible currency. There is competition among Arab producing countries and others for the available markets in the Arab region. Lebanon and Jordan, as well as Cyprus and Turkey, also produce oranges, and all try to sell to Saudi Arabia. While this total market is small, it is near at hand and offers a potential. Egypt has been successful in marketing summer and winter vegetables, as well as oranges, in Arab countries (Table 6.11). Watermelon exports have been particularly encouraging.

6.65 Trade with the Arab countries is bound up with governmental decisions and controls. Sources of supply may be changed suddenly and arbitrarily. The U.S., for example, has rarely sold apples to Saudi Arabia, yet in the past two years a million cartons a year of U.S. apples have been exported to that country.

6.66 The situation in the Arab world is highly volatile, and allegiances are subject to change. Such factors have an affect on markets and may change the relationships of trading partners. On the other hand, traders are often able to continue transactions in spite of political changes. Efforts should not cease to develop all possible markets in these regions.

6.67 Recognizing the trading arrangements and competitive forces around the world, the following strategy is

proposed for Egyptian vegetable exports:

- (a) Emphasize the Eastern European markets to the fullest. This area offers less competition, product quality is not paramount and Egypt has in it a locational advantage. Prices in Eastern Europe are reported to be favorable. However, the payment arrangements may constitute a drawback.
- (b) Develop the Arab market through the production and export of high-quality fruit and vegetables in all seasons.
- (c) Promote Western European markets in the off-season. Study and analyze the competition as well as the prices, and watch for market opportunities. The best-quality produce, as well as proper packaging and presentation, are essential in this market.

Conclusions

6.68 The exportation of fresh fruit and vegetables from Egypt has been a tradition. Oranges, potatoes, onions and garlic have been exported for many years. More recently, fresh vegetable exports have become an important activity.

6.69 The exportation of fruit and vegetables from Egypt is a function of the government. Two government-owned and controlled companies are responsible for the bulk of the exports. Another government-owned company is responsible for the export of dehydrated products. Private enterprise is permitted to participate in the export business with the approval of the government. A board has been established which decides whether the exports should be handled by a government company or a portion thereof allocated for private transactions. All prices are fixed by the board and all transactions must be approved by the government. Inspection for quality is mandatory.

6.70 The principal problems of increasing fruit and vegetable exports appear to be:

- (a) the inability to produce and pack adequate and consistent supplies of export-quality fruit and vegetables; and
- (b) inadequate and undependable transportation, both inland and sea-going; this includes inadequate facilities at the Cairo Airport and at seaports, which has caused unreasonable delays as well as deterioration of quality.

6.71 Under present conditions in Egypt, there is little prospect of substantially increasing exports of fresh fruit and vegetables. The following steps are proposed in order to encourage an increase in such exports:

- (a) Allocate adequate land suitable for the production of horticultural crops for export.
- (b) Improve agricultural practices, particularly disease control, as well as quality and presentation.
- (c) Improve inland transportation, including roads.
- (d) Provide better communications, particularly telephone.
- (e) Revitalize port services, including the development of cold storage at seaports and airports; install container shipment facilities; reduce paperwork and delays in port transit.
- (f) Allocate an increasing proportion of fruit and vegetable exports to the private sector.
- (g) Reduce marketing costs.

New Lands as the Source of Exports

Setting

6.72 The analysis of the export potential for Egypt's fruit and vegetable products generally has established that there are profitable market opportunities for a considerable range of commodities. Severe institutional constraints are interfering with the successful expansion of the export trade in these commodities, especially those moving through government channels. The more delicate and perishable the products, the more severe the problems.

6.73 What is the most likely role for the New Lands in efforts to expand exports of fruit and vegetables? The following assumes that steps will be taken to insure that the institutional constraints will be reduced gradually. (For the present, however, it must be recognized that they will persist and that export operations will have to be tailored to minimize their constraining effect.) It also assumes that despite the impact on the economics of reclamation from the high cost of energy for pumping water, there will be room for consideration of the

New Lands' production for export. It may even be one of the most significant ways to reduce losses on existing highlands reclamation projects where it is decided to sustain output or possible to realize a profit on new ones by taking advantage of the high value added in production for export.

Special Constraints on Production of Export Commodities in New Lands

6.74 In some respects, the New Lands may be at a disadvantage relative to the Old Lands in Egypt with regard to export crops. (This refers to matters other than the high cost of energy which is a constraint to all production on New Lands requiring a water lift of major proportions). Obviously, this will vary from one New Lands location to another. Generally, areas which are more remote and less accessible to basic public services (e.g. utilities and transport) will suffer the most disadvantage. But since it is inherent in the process of developing new areas that they should have fewer services and facilities of most types than older settled areas, the New Lands are likely always to suffer disadvantages to some extent in relative terms.

6.75 Distances from major markets, seaports, airports and other centers where economic and social services are available is an obvious factor in regard to all production operations. When high-technology production operations for export and the movement of perishable export goods are involved, the distance factor may be especially crucial. Not all New Lands will suffer equally. Some may be only at a moderate disadvantage. But the more remote locations may have special problems providing a sufficiently attractive socio-cultural environment to attract and hold skilled people. This will be even more difficult if management is not afforded the freedom to pay such personnel at a rate to compensate for both their skill level and the hardship of the remote location.

6.76 In some remote locations, as at Tahaddi, there may be particular difficulties in providing adequate and reliable utility services, particularly electricity. This may be a function of several factors, such as design, capacity and maintenance as well as remoteness. But again, the remoteness factor peculiar to the New Lands complicates the problem. Dependence on power for pumping (cost aside) makes reliability critical. This is of particular significance also for export operations because the maintenance of quality standards which is so

essential to success may be heavily dependent on regular availability of water supplies and electricity, for cleaning, grading, sorting, packing and the cold storage of delicate and/or perishable products.

6.77 Some New Lands areas are served by roads which traverse substantial distances where the only destination upon leaving a main road is the particular project area. This is the case with Tahaddi/South Tahrir. The distance alone is a significant cost factor. If, in addition, those roads are not well maintained, the cost of frequent movement of goods in and out, as would be involved in an export-oriented project, could add a cost burden of significant and even unbearable proportions to the operation. Since this is a feature of the operation which (like electrical service) would lie outside of the purview of project management, (especially for a joint venture) it involves risk which could raise the threshold of minimum expected return for a private investor to make a positive decision to proceed with a prospective undertaking.

6.78 A constraint which raises a fundamental issue in the use to be made of any reclaimed lands is low quality of all such soils. Most of the land reclaimed in the last 25 years in Egypt, as well as that which is available for future reclamation, is Class IV. Yield potentials tend to be low, costs high and requirements for soil, crop and water management very demanding in such soil types.

6.79 In relation to export capacity, therefore, the New Lands will need to be assessed with particular care. Crops and rotation patterns on the New Lands should reflect the above constraints by minimizing the risks associated with those constraints and selecting those which have comparative advantage in relation to the Old Lands.

Advantages of New Lands in Production of Crops for Export

6.80 The light sandy soils of higher areas have proved to be well-suited to root crops: peanuts, potatoes, onions, garlic, carrots and sweet potatoes. For a number of these, Egypt has an established export position. Peanuts in particular, are advantageous due to their better yield in sandy soils and the greater ease of harvesting. In the New Lands not yet infected with nematodes, there would be particular advantages if measures were taken to avoid their introduction by not applying Nile mud and/or manure brought in from the Old Lands. Peas and possibly green beans are well adapted

as winter crops on the New Lands and do enjoy a good export potential. For these crops, then, the New Lands may be sufficiently well suited that some major part of Egypt's production for export should be reserved for the New Lands. Detailed economic analyses and possibly some agronomic tests need to be conducted to determine how solid these apparent advantages may prove to be in practice.

6.81 The New Lands offer the possibility not readily realized in the Old Lands of bringing to bear the high technology and management skills of joint venture undertakings on a scale sufficiently large to realize significant economies and to be attractive to potential investors. Granted, many other constraints need to be eased (e.g. institutional and bureaucratic obstructions) if these advantages are to be realized. But if they can be, then efficient production techniques applied to products for export may be a comparatively good use of available irrigation water, even with the high cost of energy for pumping. By assisting joint ventures to achieve good returns from exports through efficient production, a variety of domestic resources may be employed with desirable social benefits while producing at least a satisfactory (though not likely a spectacular) internal economic rate of return.

APPENDIX

SURVEY OF FOUR FRUIT AND VEGETABLE MARKETS

IN THE EUROPEAN ECONOMIC COMMUNITY,

DECEMBER 1979

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APPENDIX

SURVEY OF FOUR FRUIT AND VEGETABLE MARKETS IN THE EUROPEAN ECONOMIC COMMUNITY, DECEMBER 1979

Summary

6.A.1 The European Economic Community constitutes a tremendous market for food. Within its present borders, it includes more than 265 million consumers. The proposed enlargement would increase the EEC population to more than 308 million people. It is the largest coordinated economic block in the world. It is prosperous; living standards are high. Under the Common Agricultural Policy, domestic agriculture is protected and imports of fruit and vegetables are subject to the reference price system as well as minimum quality standards. Consumers demand quality food products and all fruit and vegetables are subject to the EEC grading and labeling system.

6.A.2 The EEC produces its own food during the summer season, but must import much of its food needs during the winter and spring months. The EEC market for fruit and vegetables is severely competitive. Off-season fruit and vegetables are imported from many countries around the world; there is little locally-grown produce available in the off-season except from greenhouses. Most sales are made by private treaty on a commission basis. Only one important auction market continues to operate. Dozens of firms are engaged in importing and marketing fruit and vegetables in the EEC. They point out that to succeed in supplying the EEC food markets and to sell at profitable prices, the following conditions are essential:

- (a) Excellent product quality and condition
- (b) Properly packaged and well presented
- (c) Available on the market throughout the season
- (d) Backed by an information and promotion program

6.A.3 With the help of extension advisors, Egyptian farmers are considered competent to produce fresh fruit and vegetables of export quality. The important question is whether Egypt will provide a system that will permit a successful export program to Western Europe to operate. Commodities must be grown and allocated for export, and not merely be dependent upon what is left over after the domestic market in Egypt has been satisfied. Many practices need to be changed, as outlined in the report.

6.A.4 Western Europe must import fruit and vegetables in the winter and spring months; markets are available. It is up to the Egyptians to determine whether they want to do what is necessary to participate and succeed in this important market. It is not likely to come about under the present system in Egypt.

Survey of Four Fruit and Vegetable Markets
in the European Economic Community

6.A.5 After studying the marketing arrangements and facilities for fresh fruit and vegetables in Egypt, the fruit and vegetable export specialist spent two weeks in Europe assessing the possibilities of increased sales of Egyptian produce in Western European markets. The markets surveyed were Rome, Hamburg, Rotterdam, and London.

Rome

6.A.6 In Rome, the large central market called Mercati Generali is located at Via Ostiense. Since Rome is not a port city, imports come largely through the ports of Naples, Genoa or Trieste. This is not a large import market inasmuch as Italy, including Sicily, grows much of the produce needed for the Italian market.

6.A.7 Oranges: Italy produces large quantities of oranges and lemons, but little grapefruit. As a result, Italy does not permit the importation of oranges, Mandarins, or lemons at any time. Grapefruit is imported from Israel, the U.S.A. and elsewhere. Italy exports substantial quantities of oranges and lemons. For this reason there is no opportunity to market Egyptian oranges in Italy.

6.A.8 Garlic: Italy is a good market for garlic, including Egyptian garlic in April and May when there is no locally-grown garlic available. A number of garlic importers and wholesalers were interviewed concerning Egyptian garlic. They complained that the Egyptian garlic cloves were too small; that buyers preferred garlic with a tinge of red color. They reported that they would rather handle Spanish or Argentinian garlic, and purchased Egyptian garlic when other sources were not available. They also complained about the shrink of Egyptian garlic; that it was shipped too soon and buyers lost money as a result of the loss of weight. The first shipments from Egypt are very moist; later shipments are better. It was reported that Egyptian garlic generally sells at a lower price than garlic from other sources. Importers purchase garlic FOB; there are no commission sales.

6.A.9 Watermelon: Italy imports melons, including watermelons, during the season when no Italian-grown melons are available. Egyptian watermelons are imported from mid-April to early July; melons are also imported from Israel and Lebanon. Importers purchase watermelons on an FOB basis, not on commission. Melons are packed in cartons referred to as "bamboo cartons," with usually four to five melons per carton. Some breakage occurs in transit.

6.A.10 Italy's importers and wholesalers were generous in their approval of Egyptian watermelons. They reported the flavor and color of the melons from Egypt was better than similar melons from other sources. Wholesale prices for early Egyptian watermelons on the Rome market were reported to be 7000 - 8000 lira per carton. It was suggested that more could be sold. When Italian-grown melons reach the market in early July, there is no possibility for imported watermelons to compete.

6.A.11 Food and Agriculture Organization (U.N.): Officials of FAO in charge of studies and projections of production and marketing of citrus fruit were interviewed in Rome. They confirmed their earlier studies which show that in 1985 the supply of oranges will be in excess of demand on international markets. The citrus production and marketing program to be adopted in Cuba was still a question, but increased quantities of Cuban citrus fruit are appearing in Western European markets.

6.A.12 An Egyptian orange and banana grower was interviewed, who is a Senior Officer at FAO and has worked in FAO for many years. He owns a farm and produces oranges and bananas near Benha, north of Cairo. He advised that Egypt needs to improve the quality of oranges and to provide a more consistent supply. He also observed that producers can improve their practices; that producers sometimes harvest oranges by knocking them from the trees with clubs, and usually harvest immature fruit.

6.A.13 Finally, he suggested that too many middlemen are involved in marketing Egyptian oranges. Agents or middlemen are involved in sales from farmers to packing stations; between farmers and the wholesalers; and between wholesalers and retailers. Each of these transactions involves a commission which adds to the cost of distribution.

6.A.14 Summary: Italy does not permit the importation of oranges; consequently, it provides no market for Egyptian oranges. On the other hand, watermelons from Egypt are well received and preferred on the Rome market, and there is opportunity for expansion. Garlic from Egypt is marketed in Rome but encounters stiff competition

6.A.4

from Spanish and Argentinian garlic. Egypt needs to improve the quality of garlic, particularly the size of the cloves, and to reduce the moisture content.

Hamburg

6.A.15 The fruit and vegetable market in Hamburg is truly an international market. It is a large market and supplies an extended area. Almost none of the fruit and vegetables offered for sale are produced in the Federal Republic of Germany (FRG); practically all are imported. An auction market operates one day a week, but auction selling is relatively unimportant. Table I provides a tabulation of the fruit and vegetables that were on the Hamburg market in December 1979. There was a complete line of fresh fruit and vegetables which had been imported from 24 countries on five continents. The quality and presentation of the produce was excellent. A number of items, primarily greenhouse products, are packed in fancy packages, colored packing materials and tied with ribbons. Hamburg is a very competitive market, with little prospect for selling inferior quality merchandise. Buyers from other markets, including Copenhagen, obtain supplies in Hamburg. There was practically no produce from Eastern Europe available at the market.

6.A.16 Interviews were held with a number of importers at the Hamburg market, including the firm that handles all fruit and vegetables exported by the El Wadi Company in Cairo. This firm has had thirty years' experience in handling Egyptian products. They also have an office in Amman, from which they market fruit and vegetables throughout the Middle East. For the most part, Egyptian fruit and vegetables are not held in high regard by the importers in Hamburg. Neither do they consider that the exporters in Egypt are knowledgeable, nor that they provide the services normally associated with export marketing of perishable commodities.

6.A.17 Oranges: The Fruit and Vegetable Importer Association in Hamburg provided data on imports of oranges into the FRG in 1978, as shown in Table II. More than a half million tons of oranges were imported in 1978, but of these, only 92 tons came from Egypt. Even Swaziland and Uruguay exported more oranges to FRG in 1978 than Egypt. Importers suggested that Egypt does not provide quality oranges on a consistent basis to compete in the Hamburg market.

6.A.18 They reported that Egyptian oranges are badly handled, and with long delays. There is no life to the oranges once they have reached Hamburg. The oranges are

packed fairly well and are shipped in ventilated stowage. The sea voyage may take from eleven to fourteen days. The oranges are displayed and sold by sample on the Hamburg auction market to the highest bidder. Table III shows quantities and value of oranges imported into the FRG from October 16, 1978, to March 31, 1979, from the countries specified.

6.A.19 The values represent declared values at border points. These data indicate that, while orange imports from Egypt were small, the value per ton ranked at the top of the scale. This may be the result of seasonal factors.

6.A.20 Potatoes: Limited quantities of potatoes from Egypt appear on the Hamburg market. However, Egypt does not grow the type of potato that German consumers prefer. There is a customary preference in Germany for yellow-flesh potatoes, whereas Egypt produces white-flesh potatoes, which are the customary diet in the Netherlands and United Kingdom. There was no particular complaint on the quality of Egyptian potatoes but they were described as ordinary. Table IV shows the quantity and value of potatoes imported into Germany from January 1 to May 15, 1978, from various countries. This period includes the Egyptian export season for potatoes.

6.A.21 These data indicate the relatively minor quantity of potatoes purchased from Egypt. In terms of value per ton, potatoes from Egypt were lower than from other countries. This, however, may be due to seasonal or condition factors.

6.A.22 Onions: The German market is short of onions in April and May, as the storage crop of onions has been marketed. There is a good market for Egyptian onions in the April - May season in the FRG, and Egypt normally takes advantage of it. The onions are generally good, but there has been some complaint of short weight and the presence of neck rot. A 25 kg bag sometimes weighs only 22 - 23 kgs, probably due to moisture evaporation. All sales are on an FOB basis, not on commission. It was generally observed that Egypt needs to supply the Hamburg market with a quality onion consistently throughout the spring season. Table V shows total onion imports into the FRG in 1978. It is evident that the FRG consumes tremendous quantities of onions. Most are supplied from within the EEC, whereas during the winter and spring months onions are supplied from the Mediterranean countries and Chile. Spain and Israel are the leading off-season suppliers, with Egypt in third place.

6.A.23 Summary: Hamburg is a large and sophisticated market with supplies obtained from all over the world. Egypt markets only a few oranges in Hamburg, in competition with oranges from many countries. Egypt cannot succeed in this competitive market unless it can provide quality oranges on a consistent basis. Hamburg is not an important market for potatoes from Egypt, because it does not produce the type of yellow-flesh potato preferred in the FRG. Egypt could have a good onion market in Hamburg if it would supply a good quality product and have onions available throughout the April - May season. Apparently exporters in Egypt give little attention to the Hamburg market.

Rotterdam

6.A.24 Because of its location, Rotterdam is a large international fruit and vegetable market, both for supplying local needs and trans-shipment to surrounding countries. It has tremendous port facilities, with direct loading from ship to rail or truck. Rotterdam remains the only large market which uses auction selling. There is no fruit and vegetable auction in Paris or London. The Hamburg auction has almost dwindled away, and the Antwerp market is declining. But in Rotterdam it is reported that 80 percent of the citrus fruit is sold by auction. Very few vegetables are sold this way. Rotterdam is a very competitive market, with a full line of fruit and vegetables from all parts of the world.

6.A.25 Oranges: Egypt ships oranges to the Rotterdam market regularly, all of which are sold at auction. There is much competition. The best oranges are said to be those from Morocco, but oranges from Spain, Israel, Greece, Cyprus, Cuba, Portugal and South Africa are also on the Rotterdam market. Some countries sell through marketing boards and engage in advertising and sales promotion. Prior to the arrival of the first cargo of 1979 Egyptian oranges in Rotterdam, a small color advertisement for Nefertiti brand oranges appeared in a market magazine.

6.A.26 Interviews with importers and handlers on the Rotterdam market disclosed that Egyptian oranges have difficulty meeting the competition. It was estimated that, on the average, Egyptian oranges sell for ten percent less than competitive fruit. Egyptian oranges do not have the quality and are generally short-lived. Also, Egypt does not keep up with technology; it does not degreen nor palletize its shipments. Importers indicated that Egypt could not sell additional oranges in Rotterdam to advantage, that it should seek other markets.

6.A.27 The first cargo of 1979 crop oranges was due in Rotterdam on December 16, to be sold at auction on December 17. The auction catalogues were printed listing all of the lots and sizes of Egyptian oranges to be sold. (See Exhibit A.)^{1/} Because of weather the ship was delayed and the sale was cancelled. This was most unfortunate as part of the good Christmas market was missed.

6.A.28 There are two fruit and vegetable auction operations in Rotterdam, each operated by separate groups of importers. Each importer prints a separate auction catalogue and provides a sample display of each lot of fruit. Sales are conducted on the basis of samples. Each importer provides its own auctioneer and clerks to conduct the sale. Each sells in rotation, with a specified time allotted to each. Sales move quickly, accompanied by much noise and mild confusion. The El Wadi Company maintains a permanent office in Rotterdam, but sells oranges through an importer. According to CLAM, a total of 2,840,000 MT of oranges was exported in 1978 from the Mediterranean countries, as set forth in Table VI. These data indicate that in 1978 Egypt exported only 5.6 percent of all oranges exported from the Mediterranean region.

6.A.29 Potatoes, onions and vegetables: Egypt markets potatoes on consignment in Rotterdam, with no big problems other than delays. These are "new" potatoes, the skin is feathered and they are very perishable. Losses occur. Onions are imported after the storage crop of onions is marketed. The principal problem is neck rot and the resulting waste. Green beans are also consigned from Egypt to the Rotterdam market. They encounter keen competition, especially from beans from Kenya. All Egyptian vegetables are sold at private sale by the importer.

6.A.30 Research: The U.S. Department of Agriculture maintains a European Marketing Research Center in Rotterdam to study and research methods of packing and shipping perishable products. A number of reports have been published, including the following:

Exhibit B - Quality of Grapefruit Imported into
Western Europe

^{1/} Exhibits are maintained at the Agriculture Division, USAID/CAIRO, and may be seen by interested persons.

6.A.8

Exhibit C - Citrus Fungicide Residues and Legislation
in Western European Countries

Exhibit D - Rail Transport of Perishable Commodities
in Europe

Exhibit E - Use of the International Standard 50- x
30- Centimeter Shipping Container
for the Export of Grapefruit

Exhibit F - Stacking and Securing Techniques for
Palletized Produce

Exhibit G - Slipsheet Handling of Citrus

Exhibit H - Resistance to Thiabendazole and Benomyl of
Penicillium digitatum and
P. Italicum Isolated from Citrus
Fruit from Several Countries

Exhibit I - U.S. Competitors in World Citrus Markets

Work has been completed on "Quality of Oranges Imported
into Western Europe" and is expected to be published soon.

6.A.31 Summary: Rotterdam is an important international
market where Egypt sells oranges, potatoes, onions and
other vegetables. Oranges have great difficulty meeting
the competition of oranges from other countries, and sell
for about ten percent less than competitive fruit.
Potatoes, onions and other vegetables suffer from delays
in marketing after harvesting. Rotterdam is a modern,
sophisticated market where quality products are essential
to successful competition.

London

6.A.32 The new Covent Garden market, south of the Thames
River in London, is the hub of the fruit and vegetable
distribution system in the U.K. The Old Borough market,
as well as the Spittlesfields market, continue to function.
Also there is the new international market near Heathrow
Airport. All sales are by private treaty; the auctions
have closed. This is a large market with every kind and
variety of fruit and vegetable from over the world. .
There are many importers who market fruit and vegetables
largely on a commission basis. The producers who market
through marketing boards include Israel, South Africa,
Morocco and, for some commodities, Australia and New
Zealand. All of these organizations operate through
panelists: wholesalers who are selected to handle and
market particular commodities. Egyptian oranges are
marketed through panelists in London.

6.A.33 Most fruit and vegetables imported into the U.K. must meet EEC quality standards. In the U.K., as in other EEC markets, the government maintains a staff of inspectors to check for quality. This inspection is generally made at the dock, but may be made in the wholesale market or in the retail store. Fruit and vegetables must meet the requirements of Class II in order to enter the EEC; however, most products meet Class I. There is practically no produce which qualifies for Extra Class. All Cuban oranges were Class II. All packages of fruit and vegetables must be labeled according to the quality category; if it fails to meet the requirements of the label, it must be relabeled with the correct quality category.

6.A.34 The U.K. Ministry of Agriculture, Fisheries and Food issues a market report each week, showing sales of fruit and vegetables from all sources, the range of prices and the most usual price. (See Exhibit L). Also, the ministry files a daily TELEX report to EEC headquarters in Brussels, listing specific selling prices for those commodities subject to reference prices. While reference prices have not been a problem for oranges, additional levies (duties) were imposed 45 times in 1979. Tomatoes, peaches, cucumbers, plums and grapes were the items most frequently involved. In fact, peaches from Greece were not permitted to enter the EEC for a period in the spring of 1979. If the average price of a controlled commodity falls below the reference price for two consecutive days, an additional duty is imposed equivalent to the difference between the average price on the two days and the reference price. The duty is EEC-wide, but is imposed only on products from the offending country. It is imposed instantly and applies to shipments enroute. It is removed once the average selling price on two consecutive days exceeds the reference price. There is no separate reference price for Class I and Class II. Average selling prices are used. The price unit used is one-half of an ECU per 100 kg.

6.A.35 Oranges: The new Covent Garden market was filled with oranges from Spain, Morocco, Israel and Cuba. There were a few late-season oranges from Brazil and South Africa. It was too early for Cyprus oranges. The first cargo of Egyptian oranges was scheduled to be on the market December 10, and a full-page color advertisement to that effect appeared in the Fruit Trades Journal. (See Exhibit J.) However, delays occurred and the Egyptian oranges arrived on December 19, too late for the bulk of the Christmas market. The cargo included 60,000 cartons of Baladi and Navel oranges. The oranges had been shipped on a very old vessel without modern stowage facilities.

6.A.36 The Egyptian oranges were displayed by the several selected panelist wholesalers in the market. Some of the cartons were dirty and a few were partially crushed. The importer placed a price of LE 2.00 a carton for the Baladis and LE 2.50 for the Navels. Spanish and Moroccan oranges were priced from LE 3.00 - LE 4.00. The appearance of the Egyptian oranges was reasonably good but not outstanding. Most of the green skin color had disappeared; there were the usual scars from limb rub, and some evidence of scale. Overall, the appearance was as good as many of the Israeli oranges on display, but the color was not as bright as the competing fruit. The major fault of the Egyptian oranges was the condition. The Baladi variety was especially bad; the fruit was soft and beginning to rot. The Navels were much better, but soft oranges were in evidence. On December 21, the Egyptian Navel oranges had been marked down to LE 2.00 per carton.

6.A.37 Interviews were held with a number of importers, including the importer who handles all the Egyptian oranges. He sells the fruit on commission and takes no risk. He also is the agent for some Cyprus fruit from the Greek side. The Turkish side of Cyprus also had grapefruit on the market and later will have oranges. (See Exhibit K, which indicates Cyprus promotional efforts). Cyprus fruit, grapefruit and lemons was abundant. The Egyptian orange importer said the sale of Egyptian oranges was going slowly. The London importers were critical of the manner in which Egyptian oranges are handled. Shipments never arrive when they are expected. Egypt uses old ships, the cheapest it can find; and refuses to advertise and promote. It won't listen to advice, but rather goes its own way. Cyprus sends 50 ships a year into the London port without problems. Israel sells 200,000 tons of fruit in the U.K. each year without problems. According to one importer, Egypt could market 30,000 cartons of oranges a week in the U.K. if it would do a professional marketing job. He added that the oranges are basically good but Egypt needs managers.

6.A.38 Potatoes, onions and vegetables: The U.K. is a good market for Egyptian potatoes and onions. They come at a time of year when the market is short. On the other hand, the condition of arrivals of Egyptian potatoes and onions was criticized; too much delay. Neck rot in onions was reported. Green beans from Kenya and other sources were on the market. They were excellent quality, well-packaged, and brought good prices. One importer suggested that there is always a demand for good green beans on the London market. He said he had on occasion imported green beans from Egypt, but was disappointed with the quality.

6.A.39 Summary: There was more optimism in the London market for Egyptian oranges than in the other markets surveyed. But the criticisms were the same: delays and late arrivals, lifeless fruit, inferior quality, no advertising and promotion. The market is there if Egypt will take advantage of it.

6.A.40 The potato, onion and vegetable story is the same; markets are available in London during the Egyptian season, but the competition is severe. Only quality products, properly packaged and well-presented, will find ready buyers at good prices.

Table I

Fresh Fruit and Vegetables Sold on the Hamburg, Federal
 Republic of Germany, Market in December 1979,
 and the Country of Origin

<u>Australia</u>	<u>Belgium</u>	<u>Bulgaria</u>	<u>Brazil</u>	<u>Cameroon</u>	<u>Canada</u>
cherries	grapes (GH) endive lettuce	apples	grapes	bananas	onions pears
<u>Chile</u>	<u>Costa Rica</u>	<u>Denmark</u>	<u>Holland</u>	<u>Ivory Coast</u>	<u>Madagascar</u>
nectarines	bananas	mushrooms	radishes	pineapple	lychees
<u>Morocco</u>	<u>New Zealand</u>	<u>Panama</u>	<u>South Africa</u>	<u>United Kingdom</u>	
orange eggplant	strawberries	bananas	mangos oranges	celery	onions
<u>Canary Islands</u>		<u>Federal Republic of Germany</u>	<u>Kenya</u>	<u>Israel</u>	
tomatoes zucchini cucumbers green peppers		potatoes cabbage carrots turnips kohl rabi spinach parsnips	green beans mangos avocados tammins	grapefruit strawberries corn on cob melons tomatoes	
<u>Italy</u>		<u>Spain</u>	<u>United States</u>		
kiwi pears strawberries melons cauliflower garlic lemons		tomatoes oranges mandarins clementines grapes garlic lemons onions pimientos green beans	papayas celery - Calif. lettuce - Calif. grapefruit - Fla., Texas limes - Fla. cranberries filberts walnuts		

Imports of Oranges by the Federal Republic
of Germany, 1978 and Country of Origin.

<u>Country of Origin</u>	<u>Tons</u>
Spain.....	232,684
Morocco.....	84,627
South Africa.....	40,745
Swaziland.....	151
Italy.....	37,814
Egypt.....	92
Algeria.....	708
Cyprus.....	3,367
Greece.....	30,383
Israel.....	114,305
Portugal.....	20
Turkey.....	20
Tunisia.....	1,118
Uruguay.....	224
United States.....	<u>1,160</u>
TOTAL.....	550,158

Source: Fruit and Vegetable Importers
Association of Hamburg and Bremen.

Table III

Quantity and Value of Oranges Imported By The
Federal Republic of Germany
from October 16 to March 31, 1978.

<u>Origin</u>	<u>Tons</u>	<u>Value (000 DM)</u>	<u>Value/Ton (DM)</u>
EEC.....	6933.7	4,210	607
Spain.....	207144.3	132,000	637
Greece.....	30089.3	19,202	638
Tunisia.....	808.5	494	611
Morocco.....	41180.8	27,961	679
Egypt.....	88.8	91	1,020
South Africa.....	6708.3	6,399	953
Uruguay.....	83.0	88	1,060
Argentina.....	543.1	469	863
Cyprus.....	1054.4	785	744
Israel.....	74164.7	45,445	613
TOTALS	369159.0	237.451	643

Source: Fruit and Vegetable Importers Association
of Hamburg and Bremen.

Table IV

Quantity and Value of Potatoes Imported By The
Federal Republic of Germany
from January 1 to May 15, 1978.

<u>Origin</u>	<u>Tons</u>	<u>Value (000 DM)</u>	<u>Value/Ton (DM)</u>
EEC.....	42503.5	33,733	793
Italy.....	42390.3	33,656	794
Spain.....	17538.6	7,343	418
Greece.....	3334.4	1,640	492
Morocco.....	2584.2	1,597	618
Egypt.....	484.0	195	403
Cuba.....	2893.6	1,230	425
Israel.....	4302.2	2,172	505
TOTALS	73661.5	47,923	650

Source: Fruit and Vegetable Importers Association
of Hamburg and Bremen.

Table V

Quantity and Value of Onions Imported By The
Federal Republic of Germany, 1978.

<u>Origin</u>	<u>Tons</u>	<u>Value (000 DM)</u>	<u>Value/Ton (DM)</u>
EEC.....	196292.5	50,018	255
Austria.....	6245.8	1,056	169
Spain.....	25229.6	20,288	804
Poland.....	6107.9	1,226	201
Czechoslovakia...	24459.8	2,921	119
Hungary.....	11114.9	1,970	177
Canary Islands...	1386.9	653	471
Egypt.....	13796.3	6,609	480
Chile.....	4528.6	2,158	476
Israel.....	18749.5	7,771	414
TOTALS	345492.0	94,799	274

Source: Fruit and Vegetable Importers Association
of Hamburg and Bremen.

Table VI

Exports of Oranges from Mediterranean Countries, 1978.

<u>Country of Origin</u>	<u>Tons</u>
Spain.....	824,000
Morocco.....	508,000
Algeria.....	30,000
Tunisia.....	37,000
Italy.....	120,000
Israel.....	655,000
Cyprus.....	69,000
Greece.....	260,000
Turkey.....	27,000
Egypt.....	150,000
Gaza.....	160,000
TOTAL	2,840,000

Source: Comité de Liaison de L'Agrumiculture
Mediterraneenne

Table 6.1

Egypt: Area in Vegetables by Season, 1950-1979 ^{a/}

(Thousand Feddans) ^{b/}

<u>Year</u>	<u>Season</u>			<u>Total</u>
	<u>Winter</u>	<u>Summer</u>	<u>Mill</u>	
1950-54	70	120	69	259
1955-59	104	200	91	395
1960-64	149	260	138	547
1965-69	170	328	170	668
1970-74	189	356	216	761
1975	203	419	263	885
1976	215	443	260	918
1977	214	452	248	914
1978	225	461	253	939
1979 (projection)	240	460	275	975

^{a/} Garlic and onions not included

^{b/} 1 feddan = 1.038 acres

Source : H.A. Tobgy, Contemporary Egyptian Agriculture, and Ministry of Agriculture, Cairo, Egypt

Fresh Vegetables and Fruit Exported by the Nile Company

<u>Crops</u>	<u>Variety</u>	<u>Packing</u>	<u>Export Season</u>
Green beans	Giza 3	In carton	November/January, April/May
Tomatoes	Money Maker Pritchard	In "	October/March
Artichokes	----	In " of 24 units	December/March
Green pepper	California Wonder	In cartons	April/June
Squashmarrow	Zockini, Iskandrani	In "	November/December, April/June.
Peas	Little Marvel	In "	December/
Celery	----	In "	January/April
Lettuce	----	In "	January/March
Carrots	----	In "	January/March
Taro(colcacia)	---	In "	January/March
Eggplant	Long&Round	In "	April/May
Watermelon	Egyptian varieties	In palm- crates	May/August
Grapes	Bannaty	In cartons	July/August
Mangoes	Egyptian Varieties	In "	July/September
Dates	Zagloul	In "	October
Pomegranets	----	In palm- crates	September
Pears	----	In cartons	July/August

Payment: By irrevocable confirmed letter of credit covering the full value of the goods.

Source: The Nile Company for the Export of Agricultural Products

Table 6.3

Exports of Major Agricultural Products

(Quantities in 1000 MT; Values in Million LE)

<u>Commodity</u>	<u>1973</u>		<u>1974</u>		<u>1975</u>		<u>1976</u>		<u>1977</u>	
	<u>Quantity</u>	<u>Value</u>								
Cotton	570.0	191.9	460.0	279.1	370.0	201.1	330.0	154.8	290.0	182.0
Rice	297.8	26.2	136.3	39.7	99.9	23.8	190.7	29.4	191.3	20.7
Oranges	246.1	15.8	161.7	11.1	209.2	18.5	168.7	18.9	169.7	21.4
Potatoes	107.9	6.6	99.8	5.9	47.6	3.2	157.7	17.2	166.1	16.4
Onions	89.4	9.3	103.4	7.6	70.0	7.0	66.1	8.0	80.9	7.3
Garlic	20.4	3.3	20.8	3.2	15.1	2.4	11.6	2.2	22.4	4.6
Tomatoes		1.2		0.5		0.6		1.6		1.2
Watermelon	3.2	0.2	3.8	0.3	13.2	1.0	12.1	1.1	26.3	2.7
TOTAL, major Agricultural Exports		255		348		258		236		261

Source: Ministry of Agriculture and Central Agency for Statistics.

Table 6.4

Actual World Consumption of Citrus and Projected Demand
(in 1000 MT)

	1975			1985			1995		
	Developing	Developed	Total	Developing	Developed	Total	Developing	Developed	Total
<u>All citrus</u>									
Fresh	14 581	15 456	30 037	20 820	19 215	40 020	22 700	20 400	42 800
Processed	710	14 502	15 212	1 275	17 555	18 830	1 400	18 200	19 600
TOTAL	15 291	29 958	45 249	22 100	36 770	58 850	24 055	38 600	62 400
<u>Oranges</u>									
Fresh	10 927	8 008	18 935	15 430	6 785	22 215	16 905	10 255	27 160
Processed	597	10 946	11 543	945	13 105	14 050	1 025	13 580	14 605
Total	11 524	18 954	30 478	16 375	19 890	36 265	17 930	23 835	41 765
<u>Mandarins and tangerines</u>									
Fresh	1 364	4 124	5 488	2 225	5 525	7 750	2 370	5 700	8 070
Processed	-	1 128	1 128	80	1 375	1 455	85	1 425	1 510
Total	1 364	5 252	6 616	2 305	6 900	9 205	2 455	7 125	9 580
<u>Lemons and limes</u>									
Fresh	1 833	1 633	3 466	2 515	1 920	4 435	2 740	2 000	4 740
Processed	57	678	735	100	820	920	115	500	615
Total	1 890	2 311	4 201	2 615	2 740	5 355	2 855	2 500	5 355
<u>Grapefruit</u>									
Fresh	461	1 690	2 151	635	2 015	2 650	690	2 075	2 765
Processed	56	1 750	1 806	175	2 240	2 415	185	2 325	2 510
Total	517	3 440	3 957	810	4 255	5 065	875	4 400	5 275

Source:

Citrus Fruit -- Supply, Demand and Trade Projections to 1985,
FAO, Rome, February 1979

Table 6.5

Actual and Projected World Trade in Citrus

	Actual		Projected net export ^a / availabilities		Projected net import ^a / requirements		Gap	
	Exports 1972-74	Imports	1985B	1985S	1985B	1985S	1985B	1985S
	(.)		Unadjusted		(in 1000 MT)		(.)	
Oranges	6 648	6 607	10 055	10 535	8 795	10 530	-1 260	- 5
Tangerines	961	758	1 485	1 500	950	975	- 535	- 610
Lemons and limes	902	952	1 440	1 400	1 355	1 405	- 85	+ 20
Grapefruit	1 050	1 151	2 075	2 410	1 635	1 705	- 440	- 710
TOTAL	9 562	9 469	15 065	16 005	12 730	14 690	-2 335	-1 315
	(.)		Adjusted (in 1000 MT)		(.)		(.)	
Oranges			10 000	10 400	9 300	10 700	- 600	+ 210
Tangerines			1 485	1 500	1 300	1 455	- 185	- 130
Lemons and limes			1 440	1 400	1 355	1 485	- 85	+ 20
Grapefruit			2 050	2 300	1 935	2 155	- 115	- 235
TOTAL			14 975	15 900	13 990	15 795	- 1065	- 135

^a Minor differences in the totals of the projected net export availabilities and net import requirements are due to rounding of individual figures.

Source: Citrus Fruit -- Supply, Demand and Trade Projections to 1985, FAO, Rome, February 1979

Table 6.6

Produce Exported by the El Wadi Company

<u>Name and Variety</u>	<u>Packing</u>	<u>Export Season</u>
Watermelons - Giza One	Cartons 20-25 Kg each contains 4-5 fruit	April till August
Grapes a. Seedless b. Romi Red and white	Cartons 5 Kg net " " " "	Mid-June till end July end July till end Sept.
Mangoes :		
Hindi about 200 gm per piece up 300	cartons 5 kg	End July till first October
Pairi " 250 " " " " 400		
Taimour " 300 " " " " 500		
Zildiya " 300 " " " " 600		
Mabrouka " 350 " " " " "		
Pomegranate Manfalti	a. Wooden Boxes 18-20 Cartons about 6 Kg	End August till Mid October.
Sweet Potatoes - Mabrouka red skin	Bruce Boxes 20 Kg	October till May.

Source: El Wadi Export Co.

Costs and Returns of FOB Sale of Egyptian Oranges
to Saudi Arabia

<u>Item of Cost</u>	<u>\$U.S. per Carton</u> 18/kg
Fruit, Class I (Egypt)	3.00
Packing costs	.50
Container	1.25
Inland transportation	.25
Port Costs	<u>.25</u>
TOTAL costs FOB Suez	\$5.25
Selling Price FOB	\$7.00
Net Returns	\$1.75

Source: El Wadi Export Company

Costs and Returns of Marketing Egyptian Oranges in Rotterdam

Following are the account sales of a cargo of Baladi oranges shipped from the Port of Alexandria, via the Anglia Express on December 11, 1978 to Rotterdam. Of the total cargo of 26,470 cartons of Baladi Oranges, 23,855 cartons arrived in good condition, 1,775 cartons were damaged and required repacking, 668 cartons were empty or missing. The sale was handled by the T. Port Organization in Rotterdam and sold at auction.

<u>Receipts</u>	<u>Dutch Florins</u>
Sales price	315,590.25
Insurance receipts	<u>36,471.00</u>
TOTAL	352,061.25
1% cash discount to buyer	<u>3,520.61</u>
Net Receipts	<u><u>348,540.64</u></u>
 <u>Expenses</u>	
Freight (U.S.\$ 19,349.57)	39,972.02
Insurance	9,084.02
Commission 5%	17,603.06
Tariff and tax	23,095.95
Import License	257.79
Wharfage-shed rent	685.65
Sampling	125.00
Survey fee	970.00
Handling charge	7,941.00
Repacking	5,201.20
Legislation (Embassy Stamp)	<u>64.85</u>
TOTAL Costs	137,452.48
Net Proceeds (Florins)	<u><u>212,323.64</u></u>
Net Proceeds (LE)	84,929.45
Cost of packed Oranges FOB Alexandria (LE)	68,308.83
Net Profit (LE)	16,620.62
Net Profit per carton (LE)	0.6279

Table 6.9

Egyptian Exports of Agricultural Crops by Commodity in 1976 and 1977

Serial	Commodity	Year	(in LE 1000)		December		Unit
			Jan - Dec	Quantity	Value	Quantity	
<u>Raw Commodities</u>							
4	Eggs	1977	16	400	2	72	000
		76	10	253	2	51	000
7	Tomatoes	77	664	3,845	24	152	Tons
		76	454	2,475	93	459	"
8	Onions, fresh	77	7,250	90,870	927	9,558	
		76	3,020	66,140	276	2,632	
9	Garlic	77	4,533	22,428	140	1,050	
		76	2,214	11,617	231	1,384	
10	Potatoes	77	16,434	166,121	785	9,271	
		76	17,155	157,673	328	3,297	
11	Artichokes	77	95	922	4	32	
		76	26	355	4	41	
12	Carrots, fresh	77	1,134	4,630	266	912	
		76	577	3,530	262	1,834	
13	Peppers, green	77	52	218	4	18	
		76	50	283	2	12	
14	Vegetables, other	77	220	1,787	27	79	
		76	84	688	18	144	
15	Vegetables, other, dried	77	328	737	5	12	
		76	251	541	15	45	
16	Bananas	77	7	39	1	6	
		76	6	41	1	8	
23	Mangoes	77	295	413	43	76	
		76	128	437	18	83	
24	Oranges	77	21,350	169,665	1,128	8,292	
		76	18,900	168,740	4,358	30,239	
25	Mandarin	77	53	469	2	30	
		76	99	930	19	184	
26	Lemons	77	95	551	22	121	
		76	71	557	1	3	
27	Grapes, table	77	27	57	4	7	
		76	35	133	-	1	
28	Watermelon	77	2,738	26,265	499	4,711	
		76	1,056	12,093	-	-	
35	Groundnuts (peanuts)	77	3,804	14,270	33	105	
		76	2,081	8,947	496	2,722	

Table 6.10

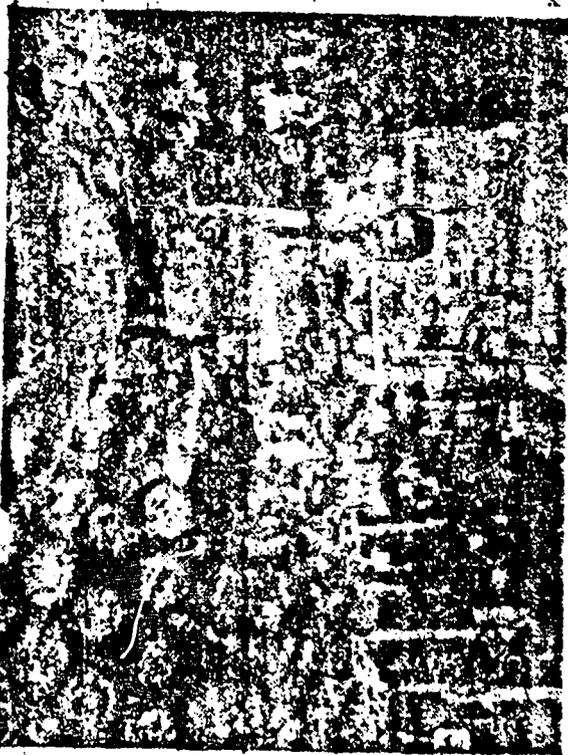
Herbs Exported from Egypt

<u>English Name</u>	<u>Latin Name</u>	<u>Export Season</u>	<u>Packing</u>
1. Cummin Seeds	Cuminum cyminum	Begins in May	Jute bags of 50 kg gross
2. Coriander Seeds	Coriandrum sativum	" " "	Jute bags of 40 kg gross
3. Anis Seeds	Pimpinella anisum	" " "	Jute bags of 50 kg gross
4. Fennel Seeds	Foeniculum capillosum	" " "	Jute bags of 50 kg gross
5. Caraway Seeds	Carum carvi	" " "	Jute bags of 50 kg gross
6. Crushed Jew's-Mallow	Corchorus oliterius	" " August	Jute bags of 25 kg gross
7. Hibiscus Flower	Hibiscus sabdariffa	" " October	Jute bags of 25 kg gross
8. Basil	Ocimum basilicum	" " June	Jute bags of 25 kg gross
9. Marjoram	Marjorana hortensis	Year round	Jute bags of 25 kg gross
10. Crushed Spearmint	Mentha varidis	" "	Jute bags of 25 kg gross
11. Crushed Peppermint	Mentha piperite	" "	Jute bags of 25 kg gross
12. Henna Leaves	Lawsonia alba	Begins in Sept.	Jute bags of 25 kg gross
13. Henna Powder	Lawsonia alba	" "	Jute bags of 50 kg gross
14. Chamomile Powder	Matricaria hortensis	Begins in February	Jute bags of 25 kg gross
15. Chamomile Flower	Matricaria hortensis	" "	Cartons of 12.5, and two cartons in one carton of 25 kg

Source: El Wadi Export Co.

Exports of Horticultural Crops by Country, 1977

<u>Eastern Europe Countries</u>	<u>Value in L.E. 000's</u>	<u>Tons</u>
USSR	16,093	116,473
East Germany	7,502	44,007
Czechoslovakia	2,219	12,762
Hungary	637	6,644
Poland	434	3,624
Yugoslavia	180	1,521
TOTAL, Eastern Europe	27,065	185,031
<u>Western Europe Countries</u>		
United Kingdom	13,209	123,773
Netherlands	2,910	18,123
France	2,338	20,004
West Germany	1,267	8,455
Italy	1,210	10,274
Switzerland	259	1,531
Denmark	199	1,866
Norway	122	1,467
Austria	82	791
Spain	69	275
Sweden	54	579
Belgium	29	80
TOTAL, Western Europe	21,748	187,218
<u>Arab Countries</u>		
Saudi Arabia	3,352	29,447
Lebanon	2,494	33,338
Kuwait	1,741	11,249
Emirates	695	4,356
Syria	639	6,960
Yemen	168	1,061
Libya	165	460
Qatar	134	465
Tunisia	87	476
Jordan	58	912
Morocco	55	293
Bahrein	44	1,177
Iraq	27	55
Sudan	15	29
South Yemen	15	105
TOTAL, Arab Countries	9,679	89,343



THE Tawfikiya Market is one of the best for produce in Cairo. The fruit and vegetables are chosen with a discriminating class. The prices are strictly controlled. Here a green grocer looks on proud of his fine display of green peppers, his stall attractively decorated with banana topped artichokes, Aspidochloa or sweetest string beans, stock of lettuce, chilies, cucumbers and 'Kohlrabi,' early in the morning before customers start pouring in.

Fruit prices rocket in markets

CUSTOMERS are finding that fruit prices are rocketing again in the Cairo and Alexandria markets, according to reports reaching the Egyptian Weekly yesterday.

Traders are charging PT 50 for a kilo of bananas in contrast to the official price of PT 15 which was passed several months ago. A trader from Alexandria even announced PT 40 a kilo.

Only for oranges, now, growth has been reported. This is the price for good quality, ripened oranges, but consumers are usually asked an extra PT 1 for the paper bag wrapping.

Dates and guavas, some of the

most of these, are now available in the market. The official prices of PT 20-30 and PT 15-20 which prevailed three months ago. Five dates, the usual price is PT 30-40, and for guavas PT 20-30.

Fruit prices have also gone up. In fact, the Arabic name for a kilo of three more, but the fruit articles outside the price is PT 60.

The fruit market by the Ministry of Supply, which makes two types today, official prices are given as follows:

Oranges	11
Small squares	5
Big squares	6
Apples	8
This list applies only to Cairo shops. — WISE.	

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 7

AGRICULTURAL RESEARCH

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

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<u>No.</u>	<u>Working Paper</u>
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2.	Sociological Considerations Tahaddi: A Case Study
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4.	Marketing System
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6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 7

AGRICULTURAL RESEARCH

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Recommendations	7.6

WORKING PAPER NO. 7

AGRICULTURAL RESEARCH

7.1 Agricultural research in Egypt: The bulk of the agricultural and agriculturally-related research carried out in Egypt has been related to the Old Lands; only a small amount of research has had the objective of increasing productivity in the newly reclaimed areas. Furthermore, new-lands research has concentrated mostly on the heavier clay soils, notably those of the North Tahrir region where the problems of rapidly rising water table and salinity levels gave rise to the UNDP/FAO project for control of waterlogging and salinity in areas West of the Nubariyah Canal. Deep sandy soils, such as those of the South Tahrir region, were regarded as having the least production potential and were therefore given a lower research priority.^{1/} The cultivators, left to their own devices, generally responded by trying to apply in the New Lands the traditional Old Lands cultivation practices. Those practices are partially transferable to the clayey North Tahrir soils, which bear more resemblance to the Delta soils; but the deep sandy soils of the South Tahrir region, with their low inherent fertility and minimal moisture-holding capacity, require very different management in order to be cultivated economically. The benefits of research leading to optimal cultivation methods would thus be correspondingly greater for the deep sandy soils.

7.2 Institutional structure: the Agricultural Research Center, a semi-autonomous authority under the Ministry of Agriculture (MOA), is an umbrella organization for twelve institutions which perform most of the

^{1/} Recently, however, the GOE accords increasing priority to research on deep sandy soils, particularly owing to Government interest in development of the Sinai.

Note: This paper was written in conformity with the original scope of work, which specified Tahaddi as a case study, and consequently it concentrates on the research problems of deep sandy soils. Subsequent findings of the study team suggest that research related to land reclamation should be focused more on the problems of low-lying soils, which usually are heavy and suffer from drainage and salinity problems.

agricultural research carried out in Egypt. These include the Desert Institute and the Soils and Water Research Institute. Research related to agriculture is also carried out by the Ministry of Irrigation, the National Research Center and various universities.

7.3 The Soils and Water Research Institute of the MOA is charged with studying soil and water as related to plant production in the Nile Valley and its fringes. Although most of the work of the institute is focused on the Old Lands, its Sandy and Calcareous Soils Section is specifically focused on research regarding soils and water conditions in the reclaimed areas on the Nile Valley fringes. This section is concerned with (a) improving physical soil properties, such as water-holding capacity, (b) investigating soil-water-plant relationships, and (c) studying fertilization and micro-nutrients. The section has performed, in the South Tahrir area, experiments with gypsum additives and with spraying of asphalt emulsion; each of these methods increased peanut yields by about 33 percent. A larger experiment of spraying asphalt emulsion on 100-fd is being planned (para 7.13). The Sandy and Calcareous Soils Section has an experiment station for calcareous soils in Nubariyah; an experiment station for sandy soils is being installed in Ismailiyah but still lacks sufficient equipment. The professional manpower resources of the section consist of about 46 professionals, distributed as follows:

Professional Staff of the Sandy and Calcareous Soils Sec.

	Total <u>Professionals</u>	<u>Ph.Ds</u>	Ph.D. <u>Students</u>
a) Sandy soils subdivision Gizah	20	2	7
b) Ismailiyah experiment station	6	-	-
c) Calcareous soils subdivision Gizah	20	2	12
d) Nubariyah experiment station	<u>10</u>	<u>-</u>	<u>4</u>
Total	56	4	23

7.4 These considerable professional manpower resources are underutilized due to a lack of laboratory facilities, vehicles and operating budget. The section has laboratories for soil and plant analysis but needs more facilities for soil physics and soil chemistry studies, soil moisture detection, micro-nutrient absorption experiments,

etc. The section is interested in performing more applied research on improving productivity on sandy soils.

7.5 The Desert Institute, established in 1934 and inaugurated in 1951, is located in Al Matariyah (Cairo). The Desert Institute is principally concerned with the study of desert areas outside of the Nile Valley fringes. Its objectives are to:

- (a) evaluate the natural resources (especially agricultural resources) of desert areas;
- (b) find means for the control of desertification; and
- (c) train postgraduates in desert research.

7.6 The Desert Institute consists of four divisions: (a) hydrogeology, (b) soils, (c) plant production and (d) animal husbandry. There are plans to add a division to study solar and wind energy and another for studying human resources in desert conditions. The staff of the Desert Institute comprises 475 persons, including about 208 technical staff, of whom nearly 100 are Ph.D.s. In particular, the Soils Division has about 15 Ph.D.s, of whom four or five are specialized in soil-plant-water relationships. The Desert Institute possesses about 25 partially equipped laboratories, a library, and field research equipment. The Institute operates a 100-fd experiment station at Maryut which possesses, among others, facilities for irrigation research.

7.7 The results produced by the Desert Institute to date have been much less than what might have been expected of such a line-up of qualified personnel. Institute management feels that the main constraint has been the lack of an organic link between its scientific staff and the personnel of the executive agencies, such as the Ministry of Irrigation and the Extension Service. The usefulness of the research has also been reduced because of an overemphasis on thesis-oriented, at the expense of, applied research. The above remarks apply to the research performed by the other research institutes and universities as well.

7.8 Research on subjects relevant to the Tahadci area -- notably on amelioration and irrigation of deep, inert sandy soils -- has so far been limited. About 1955 - 1957 some research into such soils was carried out, but the work has been discontinued.

7.9 The Ministry of Land Reclamation does not have its own research activities.

7.10 The South Tahrir Company has some laboratory facilities, apparently in poor condition.

7.11 University-based desert research: Some research related to the amelioration of sandy soils is being carried out in Cairo University, Al Azhar University and possibly in Ayn Shams, Alexandria and Zagazig Universities, especially through the preparation of student dissertations. The Suez Canal University (in Ismailiyah) plans to undertake such research in conjunction with the new Soils and Water Institute experiment station (para 7.3). The activities of the American University in Cairo are discussed in the following.

7.12 The American University in Cairo (AUC), as a follow-up of the "Cairo Workshop on Applications of Science and Technology for Desert Development" which it organized in Sept. 1978, established in Jan 1979 a Desert Development Demonstration and training project. The objective of this project is to establish alternative models for desert development. To this end, AUC has obtained from the MLR 500 fd in the Intilaq sector of South Tahrir for the establishment of pilot projects, as well as a mandate to produce, by 1981, a feasibility study for the development of 7000 fd in the Intilaq sector. AUC has also been granted by the Ministry of Development and New Communities (MODNC) 200 fd in Sadat City for urban desert development and a budget of LE 75,000 for constructing a center on that site. AUC has established cooperation agreements with the Agricultural Research Center, the MLR, the MODNC, the U.S. Consortium for International Development (CID), the U.S. Solar Energy Research Institute, and prominent Egyptian academicians in related fields. The AUC plans to compensate for, and indeed turn to advantage, its lack of an agricultural faculty by drawing qualified individuals from the above sources into a quality-oriented, field-based multi-disciplinary effort. The Desert Development Demonstration and Training Program intends to provide experience in increasing the productivity of desert development projects and in introducing new demonstration activities, rather than to undertake dissertation-oriented research. The subjects of demonstration are planned to be:

- (a) alternative soil and water management systems, including dry-farming methods, on different-size farms;
- (b) choice of crops, including nonconventional arid-land crops such as jojoba for lubricants and guayule for rubber;
- (c) livestock development;

- (d) afforestation (selection of species and management methods);
- (e) controlled-environment agriculture (cultivation within enclosures);
- (f) wind, solar and biomass energy devices;
- (g) local building materials and appropriate architecture;
- (h) desertification control (windbreaks, sand dune stabilization);
- (i) biosaline research (food production from saline environments); and
- (j) community development (alternative infrastructure facilities).

7.13 The Academy of Science is currently starting a research project concerning economically feasible means for the amelioration of sandy soils. The research will be conducted by a seven-member team comprising scientists from the Desert Institute, Soils and Water Research Institute and the National Research Center. Negotiations are now in progress with the American University in Cairo for utilization of a part of its 500-fd site in South Tahrir (para 7.12) for the experiments. The research plan calls for the site of experiments to be ready by February 1980. The subjects of experiments may include soil amelioration by means of (a) bitumen emulsion, (b) thin plastic soil covers, (c) bentonite (a clay compound) and/or (d) inoculation with nonsymbiotic nitrogen fixers.

Conclusions:

7.14 Research work in Egypt on crop management in the reclaimed lands, especially those characterized by deep sandy soils, has been to date quite limited. There exists a notable lack of basic data regarding achievable yields, required fertilizer dosages, agricultural practices, etc.

7.15 Several institutions have research capacity in this subject, notably the Sandy and Calcareous Soils Section of the Soils and Water Research Institute (principally oriented to the Delta fringes), the Desert Institute, and to a lesser extent the Academy of Science and various universities.

7.16 The considerably qualified manpower resources of the above institutions, including numerous Ph.D.s and M.Sc.s in relevant subjects, have been prevented from being fully productive by (a) lack of adequate facilities and operating budgets, (b) overemphasis on degree-oriented as opposed to applied research, and

(c) lack of an organic connection with the extension service.

7.17 Potentially relevant to the Tahaddi area are especially (a) the program of the American University of Cairo to establish a research/demonstration/training Center in the nearby Intilaq sector of South Tahrir, and (b) the Academy of Science research project for amelioration of sandy soils, which may be located at the same site.

7.18 In sum, although research in the New Lands has been in the past quite limited, there exists a considerable infrastructure of qualified human resources on which to build.

7.19 Although the economic returns to such research cannot be estimated at present, experience in other countries and in Egypt (notably in the cotton research program) indicates that the rate of return on a properly oriented and managed research program, the results of which are speedily transmitted to the farmers through an effective extension system, may be larger than for any other type of agricultural investment. It is commonplace, for example, for the savings effected by a single fertilizer-dosage recommendation to exceed the total annual costs of a research program.

Recommendations

7.20 Until a better knowledge base for desert agriculture in Egypt than exists now is obtained, improving the productivity of previously reclaimed lands will be seriously hampered and the prospect of planning and designing an economically feasible new reclamation project is remote. The payoff can be quite high from well-designed and managed action experiments carried out on a commercial scale. The suggestion is not for long-term, academic research, but for field experiments and applications of techniques which have proved successful in other countries under similar conditions and which are very likely to show positive results in Egypt. If properly designed and executed, useful knowledge from experiments of this type would begin to be available within two to three years. The process should be continuous, though, to refine and improve the results and to test additional new techniques. The administrators of the program of experiments should become thoroughly familiar with the relevant research and experimentation which is going on in international agricultural research centers and in other countries, so as to select for testing those measures which appear to have most promise in Egyptian desert agriculture.

7.21 The experiments should have the twin objectives of raising productivity in the old New Lands and providing a solid base on which to plan and implement new reclamation projects in the future. In the event that fundamental changes in the economics of land reclamation should occur -- such as rising real food prices, more energy-efficient irrigation systems, or cheaper energy sources -- then the knowledge base for planning will be in place.

7.22 Emphasis should be on experiments in places representative of low-lying areas which, owing to the lesser pumping energy required, show intrinsically better prospects of positive economic returns. Experience needs to be gained quickly with:

- (a) low-energy irrigation methods, such as improved surface irrigation and drip, bubble and other low-pressure systems;
- (b) improved agronomics, including attainable yield levels, cultural practices, irrigation frequencies, planting dates and potential new crops such as sunflower and safflower;
- (c) fertilizer dosages and different methods of fertilizer (particularly phosphate) placement;
- (d) the economic advisability of growing alfalfa or clover for several years before starting food crop cultivation and of applying clay soil and organic matter in order to build up the soil, provide residual nitrogen and furnish livestock fodder;
- (e) the economic returns, for various crops, to subsoiling deep sandy soils;
- (f) the economic returns to deeper plowing to the utilization of seed drills;
- (g) crop management techniques appropriate to low-cost, mechanized cultivation;
- (h) pump technology compatible with smallholders' needs;
- (i) alternative ways of organizing for the operation and maintenance of irrigation systems between the project entrance and the farm gate, and

- (j) technical problems relating to the rehabilitation of heavy, low-lying soils which suffer from insufficient drainage and salinity.

7.23 An organizational formula for this program of action experiments should be defined so as to optimally utilize the existing qualified manpower of the Soils and Water Research Institute, Desert Institute and universities, and possibly the projected facilities of the American University in Cairo near Tahaddi. The organizational formula should provide for an organic link between the research program and the executive institutions, notably the MLR.

7.24 This research program should be provided with adequate facilities and operation budget as a part of any eventual donor financing of New Lands reclamation projects.

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 3

COMPARISON OF THE BENEFITS OF
DIFFERENT AGRICULTURAL PROJECTS

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

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WORKING PAPER NO. 8

COMPARISON OF THE BENEFITS OF
DIFFERENT AGRICULTURAL PROJECTS

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WORKING PAPER NO. 8

COMPARISON OF THE BENEFITS OF
DIFFERENT AGRICULTURAL PROJECTS

Returns on Agricultural Investments in the New Lands

8.1 The economic returns of functioning desert reclamation projects: Of the desert reclamation projects undertaken in Egypt between 1952 and 1976, the majority were managed as state farms. These state farms received subsidies during that period on current account, i.e. income did not defray operational expenses, not to mention investment and replacement costs. Thus it may be safely stated that to date, all state farms have shown negative internal rates of return. Even if performance will improve in the future, their internal rates of return are bound to stay far below the opportunity cost of capital.^{1/} This means that the funds invested in such projects would have added more to the gross national product (and probably would have created more productive employment) if they were deposited in banks for the private sector to borrow for investments in agriculture, industry, construction and other sectors. The reclaimed lands cultivated by smallholders have shown consistently superior returns to the state farms (Ref. 5), however, considering the long time necessary for achieving marginality (defined as a surplus of product value over cultivation costs) and the cost of the large governmental superstructure, it is doubtful whether any of them could show internal rates of return equal to the opportunity cost of capital.

8.2 Comparative economic performance of planned agricultural projects: As no ex post IRR evaluation has been performed for any existing reclamation project, the following analysis is limited to comparison of the projected internal rates of return for various agricultural projects currently in the planning or construction phase. It is probable that all of these projects will experience cost overruns and delays which will lower their IRR; however, if it is assumed that all planned projects will experience roughly the same magnitude of implementation

^{1/} Which would be approximately the free-market interest rate for investment capital (currently estimated at about 15 percent).

problems, then their projected IRRs can be meaningfully compared.

8.3 Reclamation of raw desert by large public-sector canal-based projects is an economically marginal undertaking. For projects cultivating field crops, the internal rates of return range from nine percent for the smallholder-oriented West Nubariyah Extension to 11.5 percent for Wadi Al Natrun (the benefits of the intensive technology to be used in the latter project are reduced by its very high infrastructure and management costs). Even for a high-technology project growing high-value crops, such as the Coca-Cola project for planting orange groves under drip irrigation, the projected financial IRR is only 16.3 percent. The various subsidies involved imply that the economic IRR for this project would be less than 15 percent, which is taken as a general criterion for project economic feasibility. Furthermore, the IRR of such projects is very sensitive to delays in achieving full production (in West Nubariyah, for example, a two-year delay would reduce the IRR from nine percent to six percent). Experience indicates that in raw desert reclamation projects such delays are to be expected.

8.4 Agribusiness vs. smallholder projects: In theory, management-intensive projects such as Wadi Al Natrun (Coca Cola) and the Al Fath (para 8.6) projects should have advantages over smallholder projects of more control of external variables (water supply, inputs, marketing); this advantage, however, is at least partially negated by the greater dependence of such centrally-managed projects on decisions of the government and outside investors. The high-technology joint venture projects currently in implementation (the Pepsi-Cola, Coca-Cola and Al Fath projects) are at too early a stage to predict whether they will outperform smallholders, but the difficulties and delays experienced by the projects to date indicate that joint venture projects are exposed to a significant risk factor.

8.5 The social benefits of reclamation projects derive mostly from their employment effect, which is naturally larger for smallholder projects. Smallholder projects generate one employment per three feddans, vs. one employment-equivalent for ten to 16 feddans in high-technology projects (Tables included in Main Report). A more important criterion, however, is the employment effect of a given investment. In West Nubariyah, about LE 9,300 are required to settle one smallholder family, and investment per employee in agribusiness projects is

two to three times as much.^{1/} It should also be considered that most employees on agribusiness projects would be unskilled laborers earning substantially less than self-employed small farm owners.

8.6 Reclamation projects using presently unutilized infrastructure naturally show a higher rate of return. For the Al Fath (First Arabian Company) project, which is moreover based on high-technology production of export vegetables, the projected economic IRR is 36.2 percent. This shows that utilization of existing infrastructure has a far higher rate of return than reclamation of virgin desert soils. If the value of existing infrastructure at Al Fath is assumed equal to current land price (about LE 1,000/fd), the economic IRR of that project is still 22.6 percent.

8.7 Reclamation of virgin desert by small private wells: In the eastern fringes of the Delta, Wadi Al Natrun and other locations, many thousands of feddans of desert soils have been brought under cultivation by individuals or farmer groups, sinking small wells with hand-powered rigs (usually six to eight inches), generally 30 m to 70 m deep, and cultivating some ten to 30 feddans around each well. It is estimated ^{2/} that at least 2,000,000 feddans on the Nile Valley and Delta fringes have groundwater of good quality and sufficient quantity at reasonable depths. A strip approximately ten to 12 km wide on the eastern fringe of the Delta and as much as 15 km on the western fringe is susceptible to well-field development. In spite of hundreds (perhaps thousands) of wells sunk in the last few years in the eastern fringe of the Delta, groundwater level has not dropped noticeably; and the western fringe (which overlies an old bed of the Nile) should be even more permeable. Local contractor capacity is sufficient for equipping with such wells an area of at least 20,000 to 40,000 feddans annually, and additional rigs can be locally manufactured. The serious constraint to small-well development is the shortage of galvanized seamless well casing, which must be imported and is scarce on the local market, obliging present developers to rely on second-hand casings. Shortage of adequate pumps and motors is also a problem. The cost of such small-well development is about LE 1500

^{1/} Investments per employee in agribusiness are higher than the LE 15,000 to LE 16,000 (Annex C Tables) for the Al Fath and Coca-Cola projects, since the former project has large sunk costs while in the latter the employment effect claimed is probably inflated.

^{2/} UN Project for Water Master Plan, Ministry of Irrigation.

for well and casing, plus LE 1500 for a 15 HP diesel motor and pump for a 36 m deep, six inch well irrigating 15 fd, i.e. about LE 200/fd (up to about LE 350/fd for an equipped 70 m deep well). To this should be added about LE 250 per fd in land levelling costs for small-basin irrigation (Ref. 10), plus minimal infrastructure costs (access roads, simple houses). Thus total development costs are on the order of LE 600/fd. For detailed information see Annex C.

8.8 Comparison of raw-desert development by small private wells and by large public surface-water projects shows that the IRR of small wells is significantly higher, due to their lower infrastructure costs and shorter gestation period between investment and production. An added reason for the interest of small investors (including many from the urban middle classes) in well-development is probably the opportunity for building capital. In Egypt, where a rapidly augmenting population presses on a nearly fixed land base, the price of cultivated land is bound to rise (even out of proportion to its production potential) because of its value as a store for capital and a hedge against inflation. The opportunity to benefit from appreciating land values is open to the small-well owner (who can always sell all or a part of his farm) much more than to a large joint venture (who would need to find a multi-million-dollar purchaser) or to settlers on public projects (who must wait 20 to 25 years to fully repay the land and acquire the right to sell it).

8.9 Stimulation of private-sector well-based desert reclamation could be achieved by making galvanized seamless well casings, well pumps and motors freely available on the local market. The possibility of providing equipment for small local facilities for manufacturing pressureless concrete pipe to reduce seepage losses should also be examined. While it is important to monitor groundwater levels to prevent excessive withdrawals, it is essential not to encumber private-sector reclamation by too much regulation, i.e. by requiring prior approval for the drilling of each well.

Returns on Agricultural Improvements in the Old Lands

8.10 Drainage projects, according to IBRD, shows a high rate of return. For the IBRD Nile Delta Drainage II project the economic IRR was projected as 23 percent (even with cost overruns of 25 percent and a shortfall of 25 percent in the benefits, the IRR was still a passable 15.3 percent). For the IBRD Nile Drainage III and IV projects the internal rates of return were quoted as

23 and 29 percent, respectively. It should also be noted that (assuming reasonable drain maintenance) the benefits of drainage projects come about more or less automatically, and therefore are more likely to be achieved than the benefits of agricultural production projects, which are dependent on many external factors. Tables supporting Annex C show that the number of employments generated by drainage projects (in system maintenance and in increased agricultural activities) is comparable to the number of employments generated by similar investments in agribusiness desert reclamation.

8.11 Projects for improving water management through water control structures, lining canals or replacing them by buried concrete pipes, crop-adjusted irrigation frequencies, precision levelling and other measures have a considerable potential for reducing irrigation losses, increasing yields and generating agricultural employment. Another promising activity is the equipping of the presently surface-irrigated areas with standby wells to overcome the mid-summer water shortage. Although figures on the rates of return of those measures are not available,^{1/} they would probably be of the same order of magnitude as for drainage projects.

8.12 Agricultural mechanization projects show high internal rates of return. The IBRD Agricultural Development Project (Minufiyah - Sohag), which consists of the provision of tractors, pumps, other agricultural equipment and support facilities, shows an economic IRR of 32 percent. Even if the shadow wage rate of the labor displaced by the project is assumed to be zero (not a reasonable assumption in view of the scarcity of agricultural labor in Egypt, evidenced by the rapidly rising wages of such labor), the economic IRR is still a satisfactory 23 percent. Internal rates of return to various types of agricultural mechanization are high, ranging generally between 20 and 200 percent. The calculated IRRs are very sensitive to assumptions regarding the yield increases occasioned by mechanization, about which no field data exists in Egypt yet. Nevertheless, the average of several reasonable assumptions shows an economic IRR of 44 percent for tractors, 50 percent for tractors with harrows, 130 percent for subsoilers, 27 percent for tractors with scrapers (land levelling), 31 percent for repair workshops, 55 percent for small pumps, 22 percent for high-capacity rice/wheat threshers,

^{1/} Such data should be generated by the ongoing USAID Water Use and Management Project.

253 percent for small IRRI-type threshers, 41 percent for mechanical planters and 18 percent for input supply stores. On the other hand, agricultural mechanization projects are labor-saving, at least in the short run, and thus can be undertaken without negative net social consequences only selectively and in a general situation of rural labor scarcity.

8.13 Agricultural marketing: Tables included in the main report show that the USAID Co-op Marketing Project, which will supply a private-sector co-op organization with a revolving fund for input credits and provide it with technical assistance and training for upgrading technical and management skills, procedures, information systems, storage and handling techniques, is expected to have an economic IRR of 24.6 percent over a 20-year project life. IBRD fruit and vegetable project, which consists mainly of providing cold-storage and packing-line facilities, has an economic IRR of 33 percent. While the employment effect of those projects has not been estimated, it is likely to be high.

8.14 Agro-industries: Food processing plants typically have a lower IRR than agricultural marketing facilities and a high investment per employee. Economic IRR for eight such plants range from 11 to 23 percent and the investment per employee-equivalent ranges from LE 22,000 to LE 200,000. The national interest in establishing food processing plants lies in the increases of income and employment in the crop-producing areas and the reduction of food imports which they make possible, rather than in the profits and employment generated within the plants themselves.

8.15 Agricultural credit: The USAID Small Farmer Productivity Project is a five-year pilot effort to improve small farmer credit operations of 27 village banks by training, providing equipment, constructing storage facilities, improving management procedures, data collection and evaluation, and strengthening the link with agricultural extension. This should increase the timely availability to the farmers of fertilizers and other production inputs, as well as of medium- and long-term credit. The benefits of the above measures are expected to be permanent, assuming a 20- or 30-year project life gives an economic IRR of about 25 percent. While it is not possible to estimate at this point the employment-generation effect of the additional production brought about by improved credit availability, it is likely to be significant.

8.16 Agricultural research and extension: Experience in other countries, as well as in Egypt (notably in cotton research), indicates that rates of return on properly conceived and managed agricultural research and extension projects can be higher than for most other agricultural investments.^{1/}

Conclusions

8.17 State farms established in desert reclamation areas to date have shown negative internal rates of return (i.e. costs have exceeded benefits), and even if management were radically improved, their IRRs are bound to stay far below the opportunity cost of capital.

8.18 Existing reclamation projects cultivated by smallholders have produced significantly higher yields than state farms, but due to the long gestation periods involved it is unlikely that any of them would ever show a rate of return equal to the opportunity cost of capital.

8.19 The above signifies that, from the point of view of increasing the national product, the funds invested in past reclamation projects would have shown higher results if invested in the Old Lands or in other sectors of the economy.

8.20 Raw-desert reclamation projects now in planning or or initial execution stages show an economic IRR of significantly less than 15 percent -- the usual cutoff point for USAID financed projects -- both in the case of smallholders and of high-technology cultivation. Furthermore the IRR of raw desert reclamation projects is significantly reduced by even moderate delays in implementation, which in such projects are to be expected.

8.21 High-technology joint venture reclamation projects have not been functioning in Egypt long enough to prove whether or not they will show a higher rate of return than smallholder projects. Experience to date indicates, however, that joint venture operations are exposed to a significant risk factor.

8.22 The social benefits of smallholder reclamation projects are on the order of one productive direct employment created per about LE/9,000 of investment. For high-technology reclamation projects, the investment per

^{1/} Egypt Water Use and Management Project Paper (USAID/Cairo, 1975) estimates rates of return on the order of 40 percent.

employment is about two to three times as much.

8.23 Reclamation projects utilizing presently unused existing infrastructure show a far higher rate of return than reclamation of raw desert. For example, the First Arabian Company high-technology project oriented to vegetable exports has a projected IRR of 36.2 percent.

8.24 Raw desert reclamation by hand-dug private wells is currently taking place on a significant scale, especially along the eastern fringes of the Delta, without any government intervention. Roughly 500,000 feddans in Egypt are susceptible to small-well development.^{1/} Local contractor capacity is sufficient for an accelerated well-drilling program. This promising activity is presently hampered by an acute shortage of galvanized seamless well casing (which must be imported) and also of well pumps and motors. Making this equipment freely available on the local market is likely to attract significant private-sector funds to desert reclamation, not least because of the value of reclaimed land as an inflation hedge in a situation of rising land values.

8.25 Economic returns on agricultural investments in the Old Lands are significantly higher than for raw desert reclamation. The projected internal rates of return on various projects currently in planning or early execution stages are:

<u>Project</u>	<u>Economic IRR</u>
Drainage	23% to 29%
Improved water management	Not available but high
Agricultural mechanization	32%
Fruit & vegetables marketing	24% to 33%
Agricultural credit	25%
Agricultural research and extension	Approximately 40%

8.26 The employment effect of different agricultural investments in the Old Lands is expected to be as follows: negative in the short run (i.e. some labor displacement) in the case of agricultural mechanization, moderate (of about the same magnitude as for high-technology reclamation projects) in the case of drainage and water management, and high for marketing projects.

^{1/} Assuming that groundwater of good quality at reasonable depth is available in (i) a 100 km long and two to four km wide strip on the Delta fringe NE of Cairo, (ii) a 100 km long and five to 15 km wide strip on the Delta fringe NW of Cairo, and (iii) a strip averaging one km in width from Cairo to Luxor.

Recommendations

8.27 New Lands reclamation project proposals should be judged on their individual merits against the numerous opportunities for economically and socially productive investment opportunities in the Old Lands.

8.28 The recommended activities for New Lands reclamation are:

- (a) renovating the irrigation system on existing projects, providing it with a groundwater standby capacity and devising an effective system for its maintenance.
- (b) fully cultivating the presently fallow areas which are commanded by an existing irrigation system; and
- (c) breaking the constraints on private-sector raw desert reclamation by means of making well casings pumps and motors freely available on the local market and possibly setting up small private manufacturing facilities for pressureless buried concrete pipes, without posing additional constraints such as a requirement of prior approval for each well.

8.29 Priorities among the above recommended activities should be awarded to those projects, in any of the aforementioned activities, which show the highest expected economic and social benefits.

8.30 Reclamation of raw desert by means of large canal-based projects, such as West Nubariyah Extension, the Faluga and Tall Al Kabir sectors of Tahaddi, or the Sinai irrigation, should from the economic and social points of view be undertaken only after promising agricultural investment opportunities in the Old Lands (para 8.25) and in priority New Lands activities (para 8.28) have been exhausted. This means in practice that reclamation of raw desert by means of large canal-based projects should in general not be undertaken during the next five to ten years.

NEW LANDS PRODUCTIVITY IN EGYPT
TECHNICAL AND ECONOMIC FEASIBILITY

WORKING PAPER NO. 9

MAKING TECHNOLOGY THE VARIABLE

JANUARY 1980

PACIFIC CONSULTANTS
WASHINGTON D.C. USA

Preface

Pacific Consultants was engaged to conduct a set of feasibility studies which resulted in a report, New Lands Productivity in Egypt: Technical and Economic Feasibility, January 1980.

In the process of doing the study, a set of working papers was prepared -- of which this is one -- which contain more detailed background and descriptions on certain aspects of the study than the summary report. Following is a list of the working papers.

<u>No.</u>	<u>Working Paper</u>
1.	Crop Budgets and Farm Plans
2.	Sociological Considerations Tahaddi: A Case Study
3.	Credit and Input Supply System
4.	Marketing System
5.	Prices
6.	Perspectives for Fresh Produce Exports
7.	Agricultural Research
8.	Comparison of Benefits of Different Agricultural Projects
9.	Making Technology the Variable

WORKING PAPER NO. 9

MAKING TECHNOLOGY THE VARIABLE

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WORKING PAPER NO. 9

MAKING TECHNOLOGY THE VARIABLE

Introduction

9.1 Discussions of production systems often single out either technology or the institutional environment as the variable that must be adjusted if new methods are to be adopted successfully. An excellent example is the extensive literature on the impact of tractor mechanization in developing countries. The tractor is a relatively indivisible piece of machinery that, at least in terms of ownership, is incompatible for use on the types of small farms that characterize Egyptian agriculture. In the past -- and somewhat less so at present -- the standard remedy advocated here for this indivisibility was the organization of land in such a way that the machine and the institutional environment in which it was to be used were compatible. This has meant either (a) the establishment of large farms where the tractor's capacity would be fully utilized by a single production unit, or (b) the establishment of cooperatives where a group of smallholders could use the machine jointly.

9.2 Unfortunately, these efforts at changing institutions to create compatibility between the environment and the technology have not been terribly successful in Egypt or, for that matter, in rural areas of most developing countries. In the case of large estates, problems of labor management and motivation have resulted in units of exceedingly low productivity. In the case of cooperatives, both business and social considerations have made them relatively inefficient as purveyors of capital goods services.

9.3 The failure of the alternatives indicated above has inevitably led to the emergence of a third approach, namely, the official or unofficial tolerance of hire-service markets. Even countries where socialism is more than simply a planning rhetoric, the inability of co-ops to deliver the needed machinery services to individuals who desire them has produced a flourishing private black market in tractor services.

9.4 But what about hire-service markets for indivisible technology that cannot be moved or transported as easily as tractors, threshers, seeders, etc? For example, what about low-lift pumps and tubewells? In many parts of the world, markets have developed in irrigation water. In India and Pakistan, for example, practices of moving water from the seller's well to the ultimate user even include the substitution of well water for canal water or the water of one well for another.

9.5 In most of these same countries, however, yet another method of creating compatibility between technology and the institutional environment in which it is to be implemented has involved a redesign of the technology. Tractors are downsized, often to the point where the operator can no longer ride on the machine. Similarly, various sizes of threshers, pumps and motors have been produced to make them as compatible with smallholdings as possible. Downsizing makes possible, albeit usually at some additional costs, the acquisition of machines that can be controlled entirely by the individual or the small production group.^{1/}

Irrigation Technology as a Variable in Tahaddi

9.6 In Tahaddi, about 700 feddans are sprinkler irrigated under the command of each booster pump. The pump is operated by a Ministry of Irrigation employee. Farmers complain about the operation and maintenance and evidently have virtually no voice or control to improve the situation, which is a source of frustration.

9.7 One way of looking at the problem would be to seek potential adjustments of institutional or organizational forms. Another would be to look for different irrigation or pumping technologies that are more compatible with the interests and capabilities of farmers to run.

9.8 Historical experience seems to demonstrate rather clearly that if the project were merely to provide the type of infrastructure that has been constructed in the past, there is little to be sanguine about in terms of the likely benefit-cost ratios that would emerge. On the other hand, if it is argued that the existing bureaucracy will reform itself to the point that the historical experience is no longer valid, where are the pressures

^{1/} An example of the latter case is the production team in Chinese agriculture. Each team operates roughly 75 feddans and is in almost complete control of all the technology that affects the agricultural operations that they are expected to perform and for which they are being rewarded.

for change to come from? In the absence of such a description, critics would have reason to be skeptical of the calculations made and regard them merely as the product of arithmetic and a rather naive view of social change.

9.9 To deal with this dilemma, the following paragraphs develop the argument that the necessary compatibility between technology and its institutional environment must depend heavily on a redesign of the technology, i.e. in this case the system of delivering water. This, of course, will itself require the acquiescence of the bureaucracy. Acquiring such permission, however, is a different type of problem than attempting to develop standards of conduct and a structure of incentives that would make a bureaucratic solution to the problem of providing services viable.

9.10 The crux of the technology-institutional issue for settlers in Tahaddi lies in the control over the booster pump that provides pressure for the sprinkler system through which they receive their water. Currently, the entire system is serviced by several large pumps and motors that cover roughly 700 feddans per pump. The pumps are maintained and operated by the Ministry of Irrigation staff. By far the largest number of complaints from Tahaddi settlers centered on ways in which this system operated, i.e. on its lack of reliability, its vulnerability to manipulation by MOI employees, etc.

9.11 The fact that settlers have shown themselves to be generally capable of managing their own affairs leads to the suggestion that the number of points at which the system can be manipulated should be increased. The extreme would be the western U.S. model in which the individual farmer puts his own pump in the ditch. Another potential model, also designed from the practices followed along many large rivers in the Western U.S., is one in which several farmers, say a dozen, organize a group in order to construct a large pump station to service their lands. Further examples of small-group control exist in other countries where larger units of farmers have been organized to gain control of their own water supply. (e.g. 50 farmers are considered to be a manageable group in the Philippines, seven to eight are considered to be sufficient to form a low lift "pump group" in Bangladesh).

9.12 In all cases, the crux of the matter is the extent to which a small "production team" has intimate control over the factors that enter into their production process. Regardless of the culture or agro-climatic environment, achieving the maximum feasible control over the water supply is the key to rapid adoption of new agricultural methods and to a pattern of reinvestment that is necessary for sustained increases in family incomes.

9.13 The difficulty of implementing such a decentralized system in Tahaddi -- aside from overcoming entrenched bureaucratic interests -- lies in the resource situation of the migrants who make up the settlers of the New Lands. Unlike any of the groups mentioned above, they have no land at the time of their arrival, and no capital with which to initiate the purchase of pumps, sprinkler pipes, etc.^{1/} In each of the countries cited earlier, programs were implemented in areas where the beneficiaries did possess their lands and had accumulated capital. (Indeed, irrigation programs have often been criticized on the grounds that they benefit primarily those who already have land). This probably means, therefore, that the GOE will have to foot a major portion of the investment bill for irrigation equipment for the settlers during the first several years. They will, in effect, have to provide the entire infrastructure down to and including on-farm construction.^{2/}

9.14 In most types of physical construction, there is a clear gain in terms of costs-per-feddan of large units, and the natural inclination of the GOE will undoubtedly be to minimize costs by designing a system that is controlled at a limited number of central points. The thrust of our observations at Tahaddi suggest, however, that the resulting loss of water control may also decrease the level of output; hence determining the number of control points is an optimization problem.

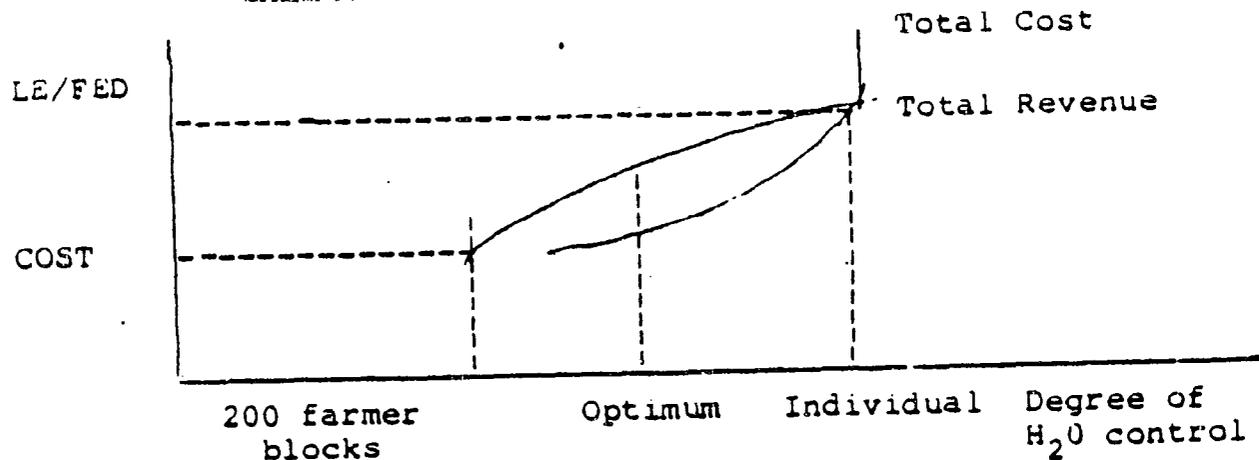
The Conceptual Problem

9.15 The decision confronting policy makers as far as the degree of control is concerned is suggested by Figure 1.

^{1/} Working Paper No. 3 describes the difficulties settlers have in becoming eligible for medium-term cooperative credit.

^{2/} These costs may ultimately be recovered, but the budget outlay at the start will be substantially greater than would be the case if a private-investor or joint-venture model were followed.

Figure 1.



9.16 Deriving the cost curve shown in Figure 1 is a manageable empirical problem. Table 9.1 shows a number of alternative levels of control (as measured by the area served by a particular booster pump); the last column indicates the clear nonlinearity of the total cost curve. That is, over an important range of alternatives, increase in control, i.e. decreases in the number of farmers services by the pump, can be obtained at less-than-proportionate increases in cost. In part, this is the result of assumptions about the costs of the very large pumps that must be obtained on special order. Perhaps more significantly, it is the result of assumptions about the pressure -- and hence size -- of pumps and motors that is required to sprinkle a series of small units as opposed to one large one. (It is not clear that it would be more difficult to maintain and repair a number of smaller pumps than a single large one. This is because one could logically assume, at least for small pump sizes, that farmers would soon learn to maintain the pumps themselves. After all -- if "their" pump fails, it is "their" water supply that is cut off).

9.17 According to these calculations, the optimal size unit for irrigation would be 200 feddans. For five-feddan farms, this would mean a group of 40 farmers. However, the savings in cost between 200- and 100-feddan units would appear to be relatively small since both blocks attain an important cost reduction by eliminating investments in open surface leads. The trade-off between control and cost might well be worth the additional expenditures that would be required.

9.18 A much more difficult question is the impact that greater water control would have on production. First,

there is simply the question of what the reduced risk and uncertainty that would accompany the presence of a series of small, locally-managed pumps would have on investments in purchased inputs. System-wide variance in water availability should be reduced enormously since having a small pump breakdown would only affect a small area. Moreover, getting such small pumps back in service would require parts commonly made by local machine shops. It could reasonably be assumed that these would soon be stocked at the site. Given the number of pumps, the demand for the most common parts would be such as to make it desirable for some shopkeepers to keep an inventory on hand.

9.19 More difficult, however, is to assess the shape of the total revenue curve. One conjecture would be that it would rise rather steeply as the size of the group was reduced from, say, 200 to 50. The former is clearly unmanageable and it is hard to conceive of developing a sense of community that was not overwhelmed by the "free rider" problem. (A "free rider" is a member of the group who abstains from contributing to the cost of something because he assumes that when the other members of the group take the necessary corrective actions, he will get the benefits "free". Since everyone thinks this way, nothing is done).

9.20 At the other extreme, it is not clear that moving from, say, a small group of ten farmers per pump to individual control would make much difference in output. Such a small group might be made up of closely-related family members or close friends, and the group would actually find they were better off than the individual in terms of keeping a slightly larger pump running for their joint benefit. If this should be the case, the upper part of the total revenue curve should be quite flat.

9.21 The shape of the considerable area that lies between the extremes of:: (a) large groups where control remains basically with the Government bureaucracy; and (b) where control lies with individual pump owners, is simply not possible to derive by analytical means. The entire problem has great need for experimentation to test a variety of hypotheses about the relationship between control over the most crucial production resource in Tahaddi and the resulting effect on the lives of the settlers.

9.22 One could, of course, again make some guesses. Indeed, it could be argued that the assumptions that underlie the benefit-cost ratios of high-yield cash crops, like

vegetables, necessarily imply some kind of decentralized water control. Net returns from extensive cereal production, on the other hand might be a better approximation of a situation in which the large-group model obtained. By implication, this would mean that the high benefit-cost ratios were overstated because the costs were understated. On the other hand, if the small-farmer group were explicitly introduced as the basis for the high benefit-cost ratios, the probability that the expected benefit-cost ratio which would actually materialize would be increased considerably.

9.23 Another element of the local control model of the Tahaddi irrigation system that would improve overall benefit-cost ratios would be the assumption that after some initial period, say five years, the farmers themselves would be responsible for all O and M costs. This idea could be further extended to a program in which the government gave the farmers the first pump, but insisted that they replace it when the original wore out. By that time, the group could be expected to have established themselves and to be producing a surplus from which the aforementioned expenses and investments could be obtained.

9.24 Moreover, they would also have an asset in the form of reclaimed land that could be used as collateral in much the same way that pump groups in other developing countries have pledged their assets. (Note that the small-group dynamics would be similar to those being proposed in USAID's mechanization project, where groups of five to six farmers are being encouraged to replace their traditional water wheels with power pumps.

Concluding Comments

9.25 Decentralizing the control over water by redesigning the sprinkler system would avoid certain types of bureaucratic inefficiency which have been the source of a great deal of complaint that this approach does not touch, namely, the operation of the canal system that leads up to the point where farmers assume control. Perhaps, with time, local government organizations will emerge that can improve the operation of this system, but for the moment, nothing practical suggests itself except improved performance on the part of the responsible officials. Failure to clean the main and feeder canals properly, lack of an assured power supply to the pumps, lack of maintenance of the more important feeder roads, etc., are not matters that a nascent settler community can be expected to cope with easily. They are having enough difficulty in simply getting the land to the point where they are assured of survival.

9.26 Exactly how this improved sense of obligation can be inculcated at the local level is difficult to say. Perhaps the first step -- despite the arguments regarding its potential disruption of the overall system -- is to provide an incentive payment scheme that would be on an order of magnitude beyond current salary levels. Perquisites in the form of housing might also be offered.

9.27 If these measures are not coupled with increased and improved oversight, however, they will not have their desired effect. Like the current 40 percent bonus, they will simply be looked upon as a just reward for enduring the privations of living so far from the central cities of the country.

Table 9.1

SPRINKLER COSTS FOR DIFFERENT SIZE OPERATIONS
(Egyptian Pounds)

Size of Farm	Cost of		Service Lead		Tertiary		Capital Cost		Annual Fixed Cost		Annual Maintenance		Operation Costs		Total Annual Costs	
	H.P.	P/M/C	Length	Cost	Length	Cost	Total	Per Fed	Total	Per Fed	Total	Per Fed	Total	Per Fed	Total	Per Feddan
5	10	365	620	3410	1995	14,960	15,325	3,065	2396	479	55	11	75	15	2,525	505
10	10	725	520	2860	1995	14,960	15,685	1,570	2378	238	63	6	150	15	2,590	259
20	10	1450	420	2310	1995	14,960	16,410	820	2415	121	79	4	300	15	2,800	140
40	20	1990	315	1730	1890	14,175	16,165	405	2320	58	90	2	600	15	3,000	75
100	40	4250	0	-	1525	11,435	15,685	155	2082	21	135	1	1,500	15	3,700	37
200	85	7470	0	-	1525	11,435	18,905	95	2555	13	216	1	3,400	17	6,200	31
300	150	16,850	0	-	3950	60,000	76,850	255	10124	34	571	2	5,100	17	15,900	53
600	288	22,304	-	-	8900	137,000	159,300	265	20743	35	900	2	11,400	19	33,600	56
1200	565	51,500	-	-	17,800	400,000	451,550	375	58560	49	2288	2	25,200	21	86,400	72

NEW LANDS PRODUCTIVITY

FEASIBILITY STUDY

TITLES OF TABLES

Working Paper
No. 1

<u>Table No.</u>	<u>Title</u>
1. 1	National Average Yields and Present Yields for Tahaddi Area by Crops
1. 2	1990 Projected National Yields and Estimated 10-Year Target Yields for Tahaddi Area by Crops
1. 3	Annual Percentage Increase of Yields for Small Landholders and Joint Venture Farms
<u>Financial and Economic Crop Budgets for One Feddan</u>	
1. 4	Citrus
1. 5	Barley
1. 6	Berseem
1. 7	Cowpeas
1. 8	Fodder
1. 9	Green Peas
1.10	Green Pepper
1.11	Lupines
1.12	Maize
1.13	Onions
1.14	Peanuts
1.15	Potatoes
1.16	Sesame
1.17	Tomatoes
1.18	Watermelons
1.19	Wheat
1.20	Financial and Economic Animal Budget
1.21	Cropping Patterns of Farmers in Tahaddi Area - 1979
1.22	Financial Analysis of Settlers' Farms, 1979 Cropping Intensity
1.23	Financial Analysis of Graduates' Farms, 1979 Cropping Intensity
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REFERENCES

1. Bailey, Wastewater Master Plan for Alexandria: Study for Reuse of Waste Water for Irrigation, 1978
2. El-Tobgy, H. A., Contemporary Egyptian Agriculture, Cairo, 1976
3. Fitch, James B. et al, the Economic Efficiency of Water Use in Egyptian Agriculture, Ford Foundation, Cairo, 1977
4. Hunting Technical Services Ltd. et al, Suez Canal Region Integrated Agricultural Development Study EGY/76/001-6, Special Report No. 2, Comparative Analysis of Reclamation Experience, Borehamwood, Herts, England, July 1979
5. Hunting Technical Services Ltd. et al, Suez Canal Region Integrated Agricultural Development Study EGY/76/001-6, Special Report No. 4, Alternative Strategies and Site Selection Criteria, Borehamwood, Herts, England, July 1979
6. IBRD, Price Prospects for Major Primary Commodities, Washington DC, June 1978
7. Ministry of Planning, ARE, The Five Year Plan 1978-1982, Vol. IV, The General Strategy for Agriculture Irrigation and Food Security; Vol. XIII, Summary of the Five Year Plan, August 1977
8. Morcos, S. and Biggerstaff, H. W., Soils of South Tahrir and Tahaddi Areas, MLR and USAID, Cairo Sept. 1979
9. Sanderson & Porter, Power Sector Survey, 1978
10. ULG Consultants Ltd. Feasibility Study of the West Noubaria Extension Reclamation and Resettlement Project, Vols I-VIII + maps, Warwick, England, August 1979, (for MLR under contract from ODA)
11. UNDP/FAO, Control of Waterlogging and Salinity in Areas West of the Noubaria Canal, Report of the Technical Project Review Mission, Rome 1977
12. USAID, An Evaluation of the Operations of the PBDAC, and a Recommended Program for Assistance, March 1979

13. USAID, Soil Conservation Service, USDA, Technical Feasibility Study (Soils, Cropping, Irrigation and Drainage), Cairo, Egypt, Sept. 1979
14. USAID, USDA, Egyptian Ministry of Agriculture, Egypt: Major Constraints to Increasing Agriculture Productivity, Washington, D.C., 1976
15. Voll, Sarah P., Egyptian Land Reclamation since the Revolution, USAID/Cairo, 1979
16. WFP/Ministry of Land Reclamation, Local Evaluation Committee, Development and Settlement of Newly Reclaimed Lands, Cairo, 1979
17. World Bank, Regional Projects Dept., Egypt: Agricultural Sector Memorandum, 1978
18. World Bank, Price Prospects for Major Primary Commodities, June 1978
19. World Bank, Working Paper No. 321, March 1979
20. Wazzan, Study and Suggestions on Criteria, Priorities and Methods of Selecting the Settlers in the Newly Reclaimed Lands Irrigated by High Dam Waters, 1972
21. Abdel Wahab Abu El Kheir, Integral Rural Development in Egypt, Latin America and the Caribbean, 1978

NEW LANDS PRODUCTIVITY FEASIBILITY STUDY

WORKING PAPER NO. 10

COMPARISON OF THE BENEFITS OF
DIFFERENT AGRICULTURAL PROJECTS

Returns on Agricultural Investments in the New Lands

11.1 The economic returns of functioning desert reclamation projects: of the desert reclamation projects undertaken in Egypt between 1952 and 1976, the large majority were managed as state farms. These state farms received during that period subsidies on current account, i.e. income did not defray operational expenses, not to mention investment and replacement costs. Thus it may be safely stated that all state farms have shown up to the present negative internal rates of return. Even if performance will improve in the future, their internal rates of return are bound to stay far below the opportunity cost of capital.^{1/} This means that the funds invested in such projects would have added more to the gross national product (and probably would have created more productive employments) if they were deposited in banks for the private sector to borrow for investments in agriculture, industry, construction and other sectors. The reclaimed lands cultivated by small holders have shown consistently superior returns to the state farms;^{2/} however, considering the long time necessary for achieving marginality (defined as a surplus of product value over cultivation costs) and the cost of the large governmental superstructure, it is doubtful whether any of them could show internal rates of return equal to the opportunity cost of capital.

1/ Which would be approximately the free-market interest rate for investment capital (currently estimated at about 15%).

2/ Comparative Analysis of Reclamation Experience, Special Report No. 2, Hunting Technical Services, April 1979

11.2 Comparative economic performance of planned agricultural projects: as no ex post IRR evaluation has been performed for any existing reclamation project, the following analysis is limited to comparison of the projected internal rates of return for various agricultural projects currently in the planning or construction phase (Table 11.1). It is probable that all of these projects will experience cost overruns and delays which will lower their IRR; however, if it is assumed that all planned projects will experience roughly the same magnitude of implementation problems, then their projected IRR's can be meaningfully compared.

11.3 Reclamation of raw-desert by large public-sector canal-based projects is an economically marginal undertaking. For projects cultivating field crops, the internal rates of return range from 9% for the smallholder-oriented West Nūbāriyah Extension to 11.5% for Wadi Al Natrūn (the benefits of the intensive technology to be used in the latter project are reduced by its very high infrastructure and management costs). Even for a high-technology project growing high-value crops, such as the Coca-Cola project for planting orange groves under drip irrigation, the projected financial IRR is only 16.3%. The various subsidies involved imply that the economic IRR for this project would be less than 15%, which is taken as a general criterion for project economic feasibility. Furthermore, the IRR of such projects is very sensitive to delays in achieving full production (in West Nūbāriyah, for example, a two-year delay would reduce the IRR from 9% to 6%). Experience indicates that in raw-desert reclamation projects such delays are to be expected.

11.4 Agribusiness vs. smallholder projects: in theory, management-intensive projects such as Wadi Al Natrūn, the Coca-Cola and the Al Fath (para 11.6) projects should have over smallholder projects the advantage of more control over external variables (water supply, inputs, marketing); this advantage, however, is at least partially negated by the greater

dependence of such centrally-managed projects on decisions of the government and the outside investors. The high-technology joint-venture projects currently in implementation (the Pepsi-Cola, Coca-Cola and Al Fath projects) are at too early a stage to predict whether they will outperform smallholders, but the difficulties and delays experienced by the projects to date indicate that joint-venture projects are exposed to a significant risk-factor.

11.5 The social benefits of reclamation projects derive mostly from their employment effect, which is naturally larger for smallholder projects. Table 11.1 suggests that smallholder projects generate one employment per 3 fd, vs. one employment-equivalent for 10 to 16 fd in high-technology projects. A more important criterion, however, is the employment effect of a given investment. Table 11.1 indicates that in West Nübārīyah about LE 9,300 are required to settle one smallholder family, and that the investment per employee in agribusiness projects is 2-3 times as much.^{1/} It should also be considered that most employees on agribusiness projects would be unskilled laborers earning substantially less than self-employed small farm owners.

11.6 Reclamation projects using presently unutilized infrastructure naturally show a higher rate of return. For the Al Fath (First Arabian Co.) project, which is moreover based on high-technology production of export vegetables, the projected economic IRR is 36.2%. This shows that utilization of existing infrastructure has a far higher rate of return than reclamation of virgin desert soils. If the value of existing infrastructure at Al Fath is assumed equal to current land price (about LE 1000/fd), the economic IRR of that project is still 22.6%.

^{1/} Investments per employee in agribusiness are higher than the LE 15,000 to LE 16,000 indicated in Table 11.1 for the Al Fath and Coca-Cola projects, since the former project has large sunk costs while in the latter the employment effect claimed is probably inflated.

11.7 Reclamation of virgin desert by small private wells: in the eastern fringes of the Delta, Wadi Al Natrūn and other locations, many thousands of feddans of desert soils have been brought under cultivation by individuals or farmer groups sinking with hand-powered rigs small (usually 6" to 8") wells, generally 30 m to 70 m deep, and cultivating some 10 to 30 fd around each well. It is estimated ^{1/} that at least 2,000,000 fd on the Nile Valley and Delta fringes have groundwater of good quality and sufficient quantity at reasonable depth. A strip approximately 10-12 km wide on the eastern fringe of the Delta and as much as 15 km on the western fringe is susceptible to well-field development. In spite of hundreds (perhaps thousands) of wells sunk in the last few years in the eastern fringe of the Delta, groundwater level has not dropped noticeably; and the western fringe (which overlies an old bed of the Nile) should be even more permeable. Local contractor capacity is sufficient for equipping with such wells an area of at least 20,000 to 40,000 fd annually, and additional rigs can be locally manufactured. The serious constraint to small-well development is the shortage of galvanized seamless well casing, which must be imported and is scarce on the local market, obliging present developers to rely on second-hand casings. Shortage of adequate pumps and motors is also a problem. The cost of such small-well development is about LE 1500 for well and casing plus LE 1500 for a 15 HP diesel motor and pump for a 36 m deep 6" well irrigating 15 fd, i.e. about LE 200/fd (up to about LE 350/fd for an equipped 70 m deep well). To this should be added about LE 250 per fd in land levelling costs for small-basin irrigation, ^{2/} and LE .../fd for minimal infrastructure (access roads, simple houses). Thus total development costs are thus on the order of LE 600/fd. Assuming Tahaddi-like cropping

1/ UN Project for Water Master Plan, Ministry of Irrigation.

2/ Feasibility Study of the West Nubariya Extension, ULG Consultants, Aug. 1979.

patterns and yield levels (a conservative estimate, considering the higher water reliability of a private well) implies gross returns of LE .../fd in year 1, growing to LE .../fd in year 5 and LE .../fd in year 10. Considering cultivation costs (based on all-family labor) and pumping costs of LE .../fd (Annex), the net return would be LE .../fd. On the basis of 20-year life for the equipment (many such wells in the region have been working 30-40 years), the internal rate of return on small-well operation would be about %.

11.8 Comparison of raw-desert development by small private wells and by large public surface-water projects shows that the IRR of small wells is significantly higher (vs. 9%-11.5%), due to their lower infrastructure costs and shorter gestation period between investment and production. An added reason for the interest of small investors (including many from the urban middle classes) in well development is probably the opportunity for building capital. In Egypt, where a rapidly augmenting population presses on a nearly fixed land base, the price of cultivated land is bound to rise (even out of proportion to its production potential) because of its value as a store for capital and a hedge against inflation. The opportunity to benefit from appreciating land values is open to the small-well owner (who can always sell all or a part of his farm) much more than to a large joint venture (who would need to find a multi-million-dollar purchaser) or to settlers on public projects (who must wait 20 - 25 years to fully repay the land and acquire the right to sell it).

11.9 Stimulation of private-sector well-based desert reclamation could be achieved by making galvanized seamless well casings, well pumps and motors freely available on the local market. The possibility of providing equipment for small local facilities for manufacturing pressureless concrete pipe

to reduce seepage losses should also be examined. While it is important to monitor groundwater levels to prevent excessive withdrawals, it is essential not to encumber private-sector reclamation by too much regulation, i.e. by requiring prior approval for the drilling of each well.

Returns on Agricultural Improvements in the Old Lands

11.10 Drainage projects, according to Table 11.1, show a high rate of return. For the IBRD Nile Delta Drainage II project the economic IRR was projected as 23% (even with cost overruns of 25% and a shortfall of 25% in the benefits, the IRR was still a passable 15.3%). For the IBRD Nile Drainage III and IV projects the internal rates of return were quoted as 23% and 29% respectively. It should also be noted that (assuming reasonable drain maintenance) the benefits of drainage projects come about more or less automatically, and therefore are more likely to be achieved than the benefits of agricultural production projects, which are dependent on many external factors. Table 11.1 also shows that the number of employments generated by drainage projects (in system maintenance and in increased agricultural activities) is comparable to the number of employments generated by similar investments in agribusiness desert reclamation.

11.11 Projects for improving water management through water control structures, lining of canals or replacing them by buried concrete pipes, crop-adjusted irrigation frequencies, precision levelling and other measures have a considerable potential for reducing irrigation losses, increasing yields and generating agricultural employment. Another promising activity is the equipping of the presently surface-irrigated areas with standby wells to overcome the mid-summer water shortage. Although figures on the rates of return of those measures are not available,^{1/} they would probably be of the same order of magnitude as for drainage projects.

^{1/} Such data should be generated by the ongoing USAID Water Use and Management Project.

11.12 Agricultural mechanization projects show high internal rates of return. The IBRD Agricultural Development Project (Minufiyah--Sohāg), which consists of the provision of tractors, pumps, other agricultural equipment and support facilities, shows an economic IRR of 32% (Table 11.1). Even if the shadow wage rate of the labor displaced by the project is assumed to be zero (not a reasonable assumption in view of the scarcity of agricultural labor in Egypt, evidenced by the rapidly rising wages of such labor), the economic IRR is still a satisfactory 25%. Table 11.2 shows that internal rates of return to various types of agricultural mechanization are high, ranging generally between 20% and 200%. The calculated IRR's are very sensitive to assumptions regarding the yield increases occasioned by mechanization, about which no field data exists in Egypt yet. Nevertheless, the average of several reasonable assumptions shows an economic IRR of 44% for tractors, 50% for tractors with harrows, 130% for subsoilers, 27% for tractors with scrapers (land levelling), 31% for repair workshops, 55% for small pumps, 22% for high-capacity rice/wheat threshers, 253% for small IRRI-type threshers, 41% for mechanical planters and 18% for input supply stores. On the other hand, agricultural mechanization projects are labor-saving, at least in the short run, and thus can be undertaken without negative net social consequences only selectively and in a general situation of rural labor scarcity.

11.13 Agricultural marketing: Table 11.1 shows that the USAID Co-op Marketing Project, which will supply a private-sector co-op organization with a revolving fund for input credits and provide it with technical assistance and training for upgrading technical and management skills, procedures, information systems, storage and handling techniques, is expected to have an economic IRR of 24.6% over a 20-year project life. The table shows also that the IBRD fruits and vegetables project, which consists mainly of providing cold-storage and packing-line facilities, has an economic IRR of 33%. While the employment effect of those projects has not been estimated, it is likely to be high.

11.14 Agro-industries: food processing plants typically have a lower IRR than agricultural marketing facilities and a high investment per employee. Table 11.3 shows the economic IRR for eight such plants to range from 11% to 23% and the investment per employee-equivalent from LE 22,000 to LE 200,000. The national interest in establishing food processing plants lies in the increases of income and employment in the crop-producing areas and the reduction of food imports which they make possible, rather than in the profits and employment generated within the plants themselves.

11.15 Agricultural credit: the USAID Small Farmer Productivity Project is a five-year pilot effort to improve small-farmer credit operations of 27 village banks by training, providing equipment, constructing storage facilities, improving management procedures, data collection and evaluation, and strengthening the link with agricultural extension. This should increase the timely availability to the farmers of fertilizers and other production inputs, as well as of medium- and long-term credit. The benefits of the above measures are expected to be permanent; however, assuming a 20-year or a 30-year project life gives an economic IRR of about 25%. While it is not possible to estimate at this point the employment-generation effect of the additional production brought about by improved credit availability, it is likely to be significant.

11.16 Agricultural research and extension: experience in other countries, as well as in Egypt (notably in cotton research) indicates that rates of return on properly conceived and managed agricultural research and extension projects can be higher than for most other agricultural investments ^{1/}.

^{1/} Egypt Water Use and Management Project Paper (USAID/Cairo, 1975) estimates rates of return on the order of 40%.

Conclusions

11.17 State farms established in desert reclamation areas have shown up to the present negative internal rates of return (i.e. costs have exceeded benefits), and even if management were radically improved their IRR's are bound to stay far below the opportunity cost of capital.

11.18 Existing reclamation projects cultivated by smallholders have produced significantly higher yields than state farms, but due to the long gestation periods involved it is unlikely that any of them would ever show a rate of return equal to the opportunity cost of capital.

11.19 The above signifies that, from the point of view of increasing the national product, the funds invested in past reclamation projects would have shown higher results if invested in the Old Lands or in other sectors of the economy.

11.20 Raw-desert reclamation projects now in planning or initial execution stages show an economic IRR of significantly less than 15% -- the usual cutoff point for USAID-financed projects -- both in the case of smallholders and of high-technology cultivation. Furthermore, the IRR of raw-desert reclamation projects is significantly reduced by even moderate delays in implementation, which in such projects are to be expected.

11.21 High-technology joint-venture reclamation projects have not been functioning in Egypt long enough to prove whether or not they will show a higher rate of return than smallholder projects. Experience to date indicates, however, that joint-venture operations are exposed to a significant risk factor.

11.22 The social benefits of smallholder reclamation projects are on the order of one productive direct employment created per about LE 9,000 of investment. For high-technology reclamation projects, the investment per employment is about 2-3 times as much.

11.23 Reclamation projects utilizing presently unused existing infrastructure show a far higher rate of return than reclamation of raw desert. For example, the First Arabian Company high-technology project oriented to vegetable exports has a projected IRR of 36.2%

11.24 Raw-desert reclamation by hand-dug private wells is currently taking place on a significant scale, especially along the eastern fringes of the Delta, without any government intervention. Preliminary calculations for such well-based cultivation indicate that the investment is on the order of LE per fd; the economic IRR is on the order of % and the social benefit is one direct employment per LE invested. These figures are significantly higher than for large raw-desert reclamation projects regardless of whether they are cultivated by state farms, graduates, settlers or joint ventures. Roughly 500,000 fd in Egypt are susceptible to small-well development.^{1/} Local contractor capacity is sufficient for an accelerated well-drilling program. This promising activity is presently hampered by an acute shortage of galvanized seamless well casing (which must be imported) and also of well pumps and motors. Making this equipment freely available on the local market is likely to attract significant private-sector funds to desert reclamation, not least because of the value of reclaimed land as an inflation hedge in a situation of rising land values.

11.25 Economic returns on agricultural investments in the Old Lands are significantly higher than for raw-desert reclamation. The projected internal rates of return on various projects currently in planning or early execution stages are:

<u>Project</u>	<u>Economic IRR</u>
Drainage	23% to 29%
Improved water management	Not available but high
Agricultural mechanization	32%
Fruits & vegetables marketing	24% to 33%
Agricultural credit	25%
Agricultural research and extension	On the order of 40%

^{1/} Assuming that groundwater of good quality at reasonable depth is available in (i) a 100 km long and 2 to 4 km wide strip on the Delta fringe NE of Cairo, (ii) a 100 km long and 5 to 15 km wide strip on the Delta fringe NW of Cairo, and (iii) a strip averaging 1 km in width from Cairo to Luxor.

11.26 The employment effect of different agricultural investments in the Old Lands is expected to be as follows: negative in the short run (i.e. some labor displacement) in the case of agricultural mechanization, moderate (of about the same magnitude as for high-technology reclamation projects) in the case of drainage and water management, and high for marketing projects.

Recommendations

11.27 New Lands reclamation project proposals should be judged on their individual merits against the numerous opportunities for economically and socially productive investment opportunities in the Old Lands.

11.28 The recommended activities for New Lands reclamation are:

(a) renovating the irrigation system on existing projects, providing it with a groundwater standby capacity and devising an effective system for its maintenance;

(b) fully cultivating the presently fallow areas which are commanded by an existing irrigation system; and

(c) breaking the constraints on private-sector raw-desert reclamation by means of making well casings, pumps and motors freely available on the local market and possibly setting up small private manufacturing facilities for pressureless buried concrete pipes, without posing additional constraints such as a requirement of prior approval for each well.

11.29 Priorities among the above recommended activities should be awarded to those projects, in any of the aforementioned activities, which show the highest expected economic and social benefits.

11.30 Reclamation of raw-desert by means of large canal-based projects, such as West Mubariyah Extension, the Fālūga and Tall Al Kbir sectors of Taḥaddi, or the Sinai irrigation, should from the economic and social points of view be undertaken only after promising agricultural investment opportunities in the Old Lands (para 11.25) and in priority New Lands activities (para 11.28) have been exhausted. This means in practice that reclamation of raw desert by means of large canal-based projects should in general not be undertaken during the next five to ten years.