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FARM RECORD SUMMARY AND ANALYSIS FOR STUDY CASES AT ABU RAIA AND MANSOURIA SITES

EWUP Technical Report No. 8

Egypt Water Use and Management Project

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Preface

This report was prepared with the cooperation of the staff of the Egyptian Water Use and Management Project with the assistance of Dr. Gene Quenemoen and Gamal Ayaad; and, Junior Economists, Lofty Nasr, Ilya Sorial, El Shinnawy, Yosef Aly, Ragy Darwish and G. Fawzy.

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INTRODUCTION

Management's responsibilities include organizational decisions about what to produce, how much to produce, and when to produce it. Effective management calls for business practices on the part of the operator to control and manage the use of resources. This means keeping good records of what has happened and having a system that provides the information needed for future planning. Public agency officials who plan policies and programs that affect farmers also require information from records of farm costs and returns. Analysis of such information can provide insight into management problems, resource constraints, enterprise combinations, cash flows, and other items needed to guide farm management advise and to evaluate the impact of policy changes on the farmer.

SCARCITY OF FARM MANAGEMENT DATA IN AFRICAN COUNTRIES

In most African countries there is very little accurate data available for economic analysis; the scarcity of data is a problem for researchers and policy makers. The data problem is particularly acute in the agricultural sector which employs over three-fourths of the labor force in most African countries.

In order to generate accurate data for planning and other purposes, a number of methods are applied to obtain information about farms and farm systems.

METHODS OF FARM MANAGEMENT AND PRODUCTION ECONOMICS RESEARCH

For collecting micro- level data from farmers we can distinguish four methods:

1. Case farm study.
2. Farm account books.
3. Farm business survey.
4. The cost route method.

These methods have been popular at different times in the history of western countries. They have all been tried in different parts of Africa with varying degrees of success.

Applications of some of these methods have been practiced in Egypt over the last twenty-five years. The Agricultural Economics Department, Ministry of Agriculture, Agricultural Economics Departments of Egyptian universities and Agriculture Research Stations have led the way in conducting these studies.

THE MODEL FARM STUDY

In the model or case farm study the operations of selected progressive farmers are studied in detail. This method became popular in the United States around the turn of the nineteenth century and continues to be practiced. Farms are visited for data recording purposes as often as necessary. Collection of farm management data from demonstration farms or from progressive farmers is still a common practice today.

The major disadvantage of using such data in economic analysis is that the farms studied are atypical; their success is often due to many factors, including unusual managerial ability. Such data cannot be used, therefore, for determining "what is", but can be of use in planning "what ought to be". The operational norm, however, becomes that of what has worked or is working for the successful farmer; conditions of economic efficiency may or may not hold.

FARM ACCOUNT BOOKS

The use of farmer kept records as a source of data for management analysis is a widespread practice today in western countries and the United States where farmers are literate. Either farmers or their agents may actually maintain the record books. Generally, these records assist farmers in financial planning and income tax management. The record systems have been designed to facilitate these uses; often such record systems are not directly applicable to developing countries in which the farming and business operations are much less complex.

In Africa farm account books have rarely been used in collecting data from traditional farmers. The illiteracy of the farmers means that they cannot keep records. Literate children have been used in keeping rough notes on their parents activities, but they can hardly be relied on to keep the detailed records needed for farm management and production economic research.

In Egypt the same problem of farmer illiteracy is present as faced by other African countries; the Egyptian farmers cannot keep records by themselves.

There are some large-size farms as well as the governmental farms which keep records for their farming business, but the main purpose for these account books is to control the work and workers; it is for administrative business, and the data recorded is not intended for management analysis.

There have been some attempts to keep farm records of the Egyptian farmer. To do so requires the development of a record or account book especially designed to fit the information needs on Egyptian farms. This effort by the Egyptian Water Use and Management Project (EWUP) is another attempt to keep farm records for some study cases. Using an account book especially prepared, records are kept on farms at each of the three sites in which EWUP is involved. The procedures established for farm record collection will be discussed in detail in the next pages.

FARM BUSINESS SURVEYS

Economic surveys were first tried in the urban areas of England, continental Europe, in Russia, and in the United States during the first decade of this century. In a farm business survey the researchers or his enumerators visit the farmers once or twice to complete a questionnaire. Farm business surveys usually cover a large sample of statistically selected farmers.

This technique provides a means of showing the range of conditions found on the farms in a region or country. Information is collected on the usual use of inputs by relying on the farmers experiences rather than on his memory of actual past occurrences. These surveys could also be effectively used in farm management studies where the aim is solely to generate data for planning purposes.

THE COST ROUTE METHOD

By this method the farmers are interviewed for at least one crop season. The advantage of this method is that events are recorded as they occur and heavy reliance is not placed on the farmer's memory.

The cost route method has been widely used in farm management and production economics studies carried out in Africa as well as in Egypt.

EWUP FARM RECORD SYSTEM

Background

Improvement of the economic and social well-being of Egyptian farmers through improvement in on-farm water management is the primary objective of EWUP. To accomplish this goal as well as providing measure of goal achievement, a measure of economic and social well-being is required. A farm record system provides a good measure of the economic status of farmers. As improvements in on-farm water management are achieved, the results of those improvements should be reflected through the record system. EWUP includes experts from four disciplines: economics, sociology, agronomy, and engineering, and operates as an interdisciplinary team.

To improve the social and economic position of Egyptian farms through the improved management of irrigation water on farms, it is necessary that project personnel become intimately acquainted with the complexities of farm management. Farm records are used to evaluate the relative contributions of alternative enterprises to farm income, cash flow patterns, to determine the factors which limit operating decisions and to provide comparisons with other farmers following similar practices.

Economists have derived a number of efficiency ratios to be used in these comparative analyses. For example, output per man, machinery and equipment investment per unit of land, or operating expense per unit of land may provide means by which an individual farm can be compared to other farms or a group average. From such analyses experienced farm management economists can derive useful prescriptive recommendations for individual farm operators.

Unfortunately, record systems and evaluative efficiency ratios have been developed and applied to commercial farming systems in developed countries. Often, these ratios and analytical comparisons are of limited applicability to farming systems such as found in developing countries. But, the concepts of comparative analyses are very relevant to farm management studies in developing economics.[1] But the concepts must be revised and uniquely adapted to describe the agriculture of developing countries and serve the analytical needs for agricultural systems of the country. The purposes of this report are to (a) present a farm record system as being applied by economists associated with the EWUP, (b) provide some comparative analyses of data obtained from these individual farm

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[1] Upton, Martin, Farm Management in Africa; the Principles of Production and Planning, Oxford University Press, London, 1973.

records, (c) suggest some efficiency ratios which are more appropriate to agriculture in Egypt and as needed by the goals and objectives of EWUP, (d) provide some preliminary analyses of the farm records data using the efficiency ratios suggested and (e) make recommendations to project personnel of required data measurements needed to make farm management record keeping analyses of most benefit to the EWUP.

FARMING IN EGYPT

The economics team works with the following background about agriculture and irrigation in Egypt:

As shown in Table 1, the agriculture area is about 6.128 million feddan (F)*, the average cultivated area per person is 0.16 F, and the average farm size is 2.05 F.[2] The cultivated area has expanded only gradually over time while population growth continues to reduce the amount of land per person. Since the Egyptian farmers cultivate at least two crops per year, the average rotated area per person in Egypt = 0.37 F and the average rotated area per each holder = 3.82 F.

Because of the declining land base per person, methods are sought to increase the output per feddan of the existing area and to expand cropping on to newly reclaimed lands. The efficiency of irrigation must be increased so that the existing lands remain productive and water is available for irrigation of new lands.

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[2] Irrigation improvement plan in Egypt, August 1979, Ministry of Irrigation.

*1 feddan (F) = 4200.8335 sq. meter = 1.0381 acre = 0.4201 hectar

Table 1. Average Cultivated Area Per Person in Egypt Since 1897

Year	Population Millions	Agricultural Area and Average Per Person	
		Total Area Million F.	Average Area Per Person F.
1897	9.717	4.943	0.53
1907	11.190	5.374	0.48
1917	12.817	5.309	0.41
1927	14.178	5.544	0.39
1937	15.921	5.312	0.33
1947	18.967	5.761	0.31
1960	26.085	5.900	0.23
1966	30.075	6.000	0.20
1970	33.200	6.000	0.18
1976	38.228	6.128	0.16

Source: Ministry of Irrigation.

Most Egyptian farms are less than 5 feddans in size (Table 2). Significant improvements in irrigation efficiencies can be made only by working with a large number of farmers. This complicates the task of EWUP and other projects; technical, economic and social problems must be solved and means to disseminate that information to a large number of independent producers must be established.

- Almost all of the Egyptian farmers are illiterate, so they cannot keep any data or records by themselves. Egyptian farmers have a suspicion of Governmental officials; this problem has to be overcome. Once they knew of the aim and goals of EWUP, study case farmers cooperated with EWUP professionals by giving the information needed.

- Almost all the farmers are members in the Government's agricultural cooperatives which are scattered among Egyptian villages. Farmers get their supplies (seeds, fertilizers, insecticides and their herbicides, . . .) from cooperatives by credit.

- No taxes are levied on farmers who own less than 3 feddans; for those who own more, the tax is based on the area which they hold and is not adjusted to their net farm income.

- Irrigation in Egypt began about 6,000 years ago.[3] The annual flood, occurring from August to October, led the inhabitants of Egypt to practice both river training and irrigation to improve their existence. Towards this objective a series of control works such as the Delta Barrage (1840) and Aswan Dam (1902) were built. The works were mainly for irrigation purposes but were also for flood control (see Figure 1).

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[3]Mona El Kady, Wayne Clyma and Mahmoud Abu-Zeid, October, 1979, on Farm Irrigation Practices. Technical Report No. 4.

Table 2. Agricultural Land Holding by Size of Farm

Census of 1965

Farm Size Feddan	Holders		Total Area		Average Farm Size Feddan
	Number	%	Feddan	%	
<5	3,033,000	94.5	3,690,000	57.1	1.22
5-10	78,000	2.4	613,000	9.5	7.87
10.1-20	61,000	1.9	671,000	8.2	11.00
20.1-50	29,000	0.9	814,000	12.6	28.10
50.1-99.9	6,000	0.2	394,000	6.1	65.30
>100	4,000	100.0	6,582,000	100.0	2.05

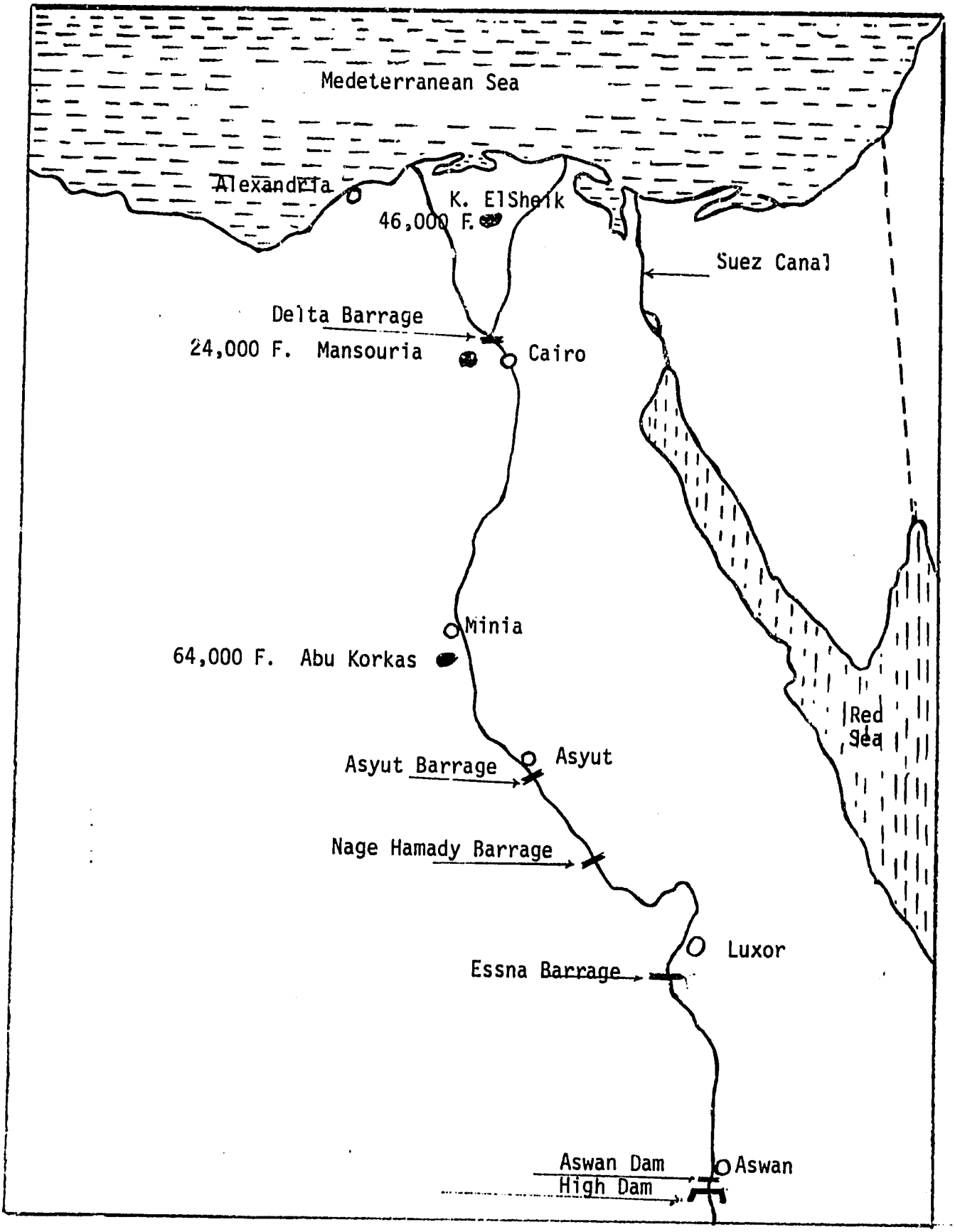

Figure 1. Location Map for Dams, Barrages, and Study Areas

The oldest known irrigation practiced in Egypt was basin (flooding) corresponding to the annual flooding of the Nile. Basin irrigation consisted of ponding water on areas flooded by the Nile and growing crops on residual soil moisture after the water receded. Since the construction of the Delta Barrage, perennial irrigation has been practiced in lower Egypt. Before the High Aswan Dam, the cultivated area was decided by the annual storage in Aswan Reservoir (5 billion m^3/year) and Bagal Aelia (2 billion m^3/ year), the base flow of the Nile and some use from ground water. This area averaged about 4 million feddans under perennial irrigation and 1 million feddans under basin irrigation of which about 0.6 million feddans were served by wells in the summer.

After the completion of the High Aswan Dam in 1970 the entire cultivated area in Egypt was placed under perennial irrigation. The amount of water available for irrigation expanded to 55.5 billion m^3/year. This volume allowed the conversion of all basin into perennial irrigation as well as the irrigation of additional lands. Perennial irrigation presently encompasses about 6.1 million feddans, of which about 1 million feddans are new lands. The cropping intensity in Egypt in 1978 is close to 2.0 or an average of two crops per year are grown on each field.

Present perennial irrigation receives water from storage behind the High Aswan Dam through scheduled releases of flow of the Nile. Barrages divert water to major canals at selected points and deliver water to supply canals administered by Governates and then to Irrigation Districts. The districts range in area from 20 to 100 thousand feddans. The volume of water diverted into major canals is based on the water requirements of the area served as determined by (1) the crops grown, (2) soil type, (3) the size of the area, and (4) the expected distribution

and farm area bases. District supply canals serve branch and subbranch canals which provide water to private farm supply channels (meskas).[4]

Water is supplied to a district on interval rotations of two or three kinds. The length of the interval depends on the crops grown. Intervals are typically four and seven days. On the three-day interval rotation, for example, the upper, middle and lower reaches of the canal receive water for an interval in turn. For the four-day and three-day interval rotation a branch canal would receive water for four days and then for eight days it receives no water.

Regulation of the flow to a branch canal is related to the available flow in the district supply canal. Water is supplied based primarily on the water surface elevation on the downstream side of the inlet gate. Usually there is no determination or allocation of a specific flow rate at any point within the district. Thus, the more water a group of farmers use on a branch canal the lower the water surface elevation and the more water supplied to that branch canal.

On a branch canal water is conveyed to farmers through an outlet which supplies a meska that serves individual farms. An outlet may serve only one farm supply point or several supply points. One farmer or a small group of farmers may take water at one supply point. Flow through the outlet that serves each meska is regulated hydraulically by the size of the outlet and the specific water surface elevation. The top of the pipe outlet is located 25 cm below the design water surface elevation. This elevation is located up to 50 cm below the surface of the surrounding land. Actually, because of variations in supply rate, use

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[4]Wolfe, Shahin and Issa, 1979

rate, local topography and the installation by farmers of additional (unauthorized) outlets, flow rates through each meska outlet vary widely. Each farmer or group of farmers must lift the water from the supply channel to the field.

- Costs of lifting water for irrigation in Egypt

As a general rule, irrigation distribution systems in Egypt are designed to supply water to farmers below the surface level of the fields.[5] Consequently, farmers are obliged to lift the water up to 1.5 meters from the delivery canals. There are exceptions; some farmers are able to irrigate by gravity. Studies conducted by the Ministry of Irrigation show that "free flow irrigation has caused an extravagance in the use of irrigation water" and there is a more or less active government policy to place all delivery systems on a lift basis. EWUP is greatly interested in the efficiency of water use and application. El Kady et al found that the present system of requiring farmers to lift their water from canals below field level also contributes to excessive use of water.[6] Wolfe et al indicated that the problem may be one of the distribution of available water among farmers rather than general over-use of water.[7] They found that farmers located at the lower reaches of canals receive only as little as one-fourth as much water as farmers nearer the water source. El Shinnawi et al studied the water distribution problem and its effect on farming practices.[8] They found

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[5]Technical report by Economic Team. Egypt Water Use and Management, Cairo on June 30, 1979, prepared by G. Quenemoen and Gamal Ayaad.

[6]El Kady, Mona, Wayne Clyma, and M. Abu-Zeid. "On-Farm Irrigation Practices in Mansouria District Egypt". Egyptian Water Use and Management Project, EWUP Technical Report No. 4. 1980.

[7]Wolfe, John W., Farouk Shahin, and M. Saif Issa, "Preliminary Evaluation of Mansouria Canal System, Giza Governate, Egypt". EWUP Technical Report No. 3. 1979.

[8]El Shinnawi, Abdel Atty, Melvin D. Skold, and M. Lotfi Nasr, "Economic Costs of Water Shortage Along Branch Canals," EWUP Technical Report No. 5, 1980.

farmers near the lower end of branch canals receive lower yields, exhibit different cropping patterns, and farm less intensively than their counterparts near the upper end of branch canals.

Several methods of lifting water are used in Egypt which involve human, animal, electric and diesel power. Human power is used to operate the shadouf* and the tambour**. The shadouf, now virtually obsolete, is used only by a few very small farmers; only the tambour is important in commercial agriculture. Animal power is used to operate various types of sakias***. Electric and diesel motors are most frequently attached to various types of centrifugal and axial flow pumps. In the lower delta some large sakias are powered by stationary diesel motors and sometimes tractors.

The cost of lifting water with a tambour, the only human powered system considered here, primarily depends on the value of human labor. The initial capital investment is low, about LE 35.0****, as are repairs and maintenance. A sakia, which has a maximum lift of 1.2 meters, has an initial investment cost of LE 500, including installation. The cost of using a cow for turning a sakia varies. If cows are used sparingly, the work may provide only normal exercise and have little effect on milk and meat production. Heavy use will require extra feed in addition to causing a reduction in meat and milk production. Typically farmers pay LE 0.35 per hour to rent a cow for turning the sakia. This includes a boy to handle and drive the cow. The useful life of a sakia is estimated to be 25,000 hours with LE 6.0 per year allocated for annual repairs.

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*shadouf - bucket and counter balance weight on a pole

**tambour - archimedes screw

***sakia - water wheels usually operated by cows

****LE - Egyptian pound 1 LE = $1.43 (U.S. dollars)

Analyses of three systems of lifting water, assuming each system is used to the limit of its practical capacity, are summarized below (see Figure 2).

Table 3. Cost of Lifting Water by Alternative Methods by Practice Pump Capacity

Power Supply	Lifting System	Practical Capacity	Cost when used to practical capacity		
			per hour	per feddan	per m^3
		Feddan	LE	LE	LE
human	tambour	7.00	0.40	51.71	.0081
animal	sakia	17.50	0.44	22.53	.0035
diesel	pump	20.75	0.32	13.82	.0022

There is interest by the Government and among the farmers in lifting water with diesel and electric pumps to replace human and animal power. Increasing costs of labor and rising prices for meat cause farmers to feel economic pressure to consider alternative methods of lifting water to their fields. Some farmers are installing water wheels to replace increasingly scarce and expensive human labor while others are shifting away from wheels to diesel and electrically driven pumps.

The need to improve water use efficiency in Egypt is great. The declining land base per capita and the large number of small farmers add to the urgency and complexity of diffusing knowledge and technology. Egyptian farmers are highly interdependent; they must share water provided by a common Government canal. The multiple cropping patterns made possible by perennial irrigation also lead to a number of interdependencies between enterprises on farms; changes cannot be made in one crop without effecting a number of other farming operations. Egyptian farmers receive their water at a very high cost. Most farmers must either lift water to their fields by human or animal power. The volume of water

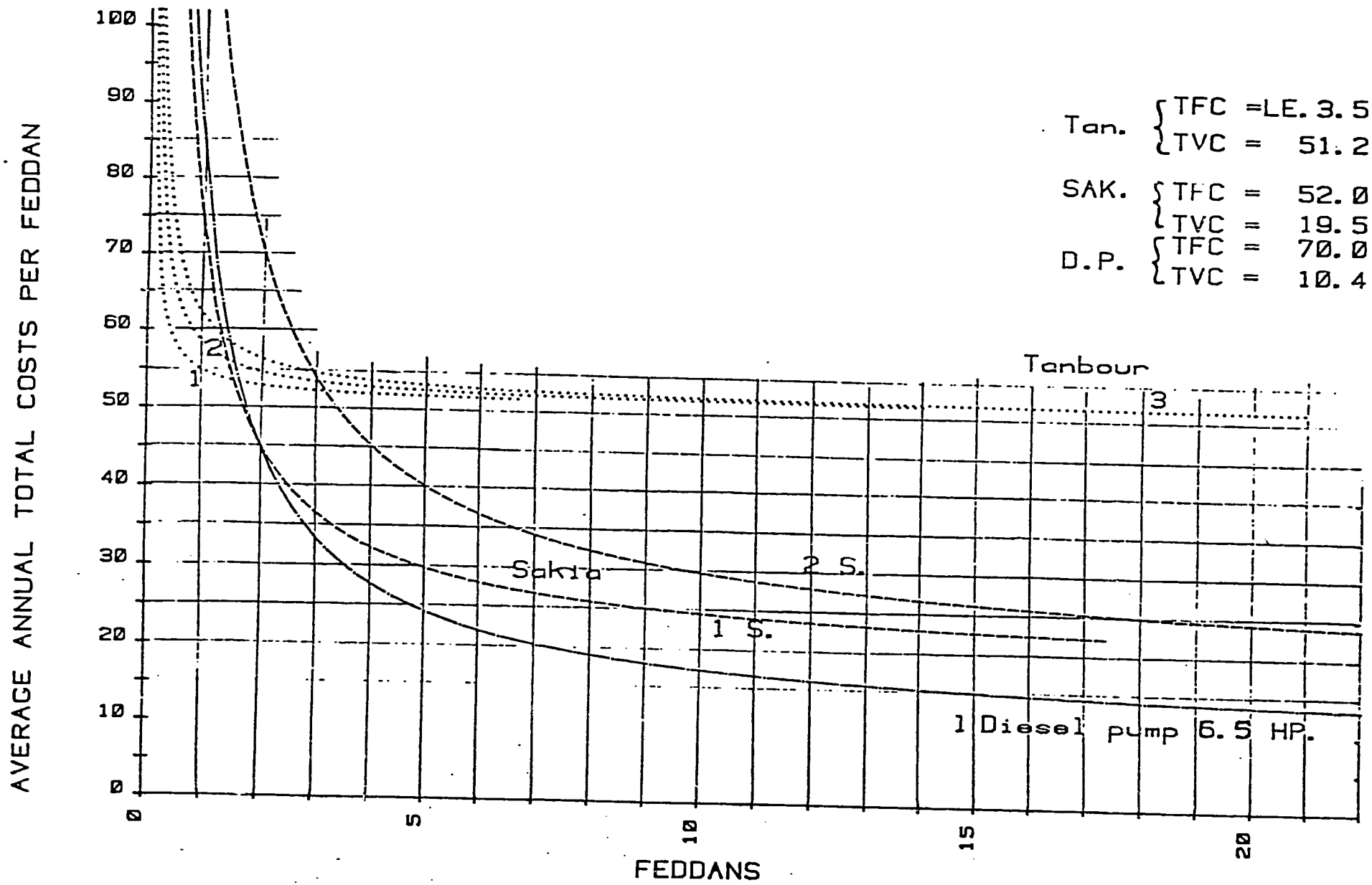

Figure 2. Water Lifting Costs for Selected Alternatives

that can be lifted by these methods often contributes to inefficient use.[9] Changes in timing and methods of water delivery and methods of application to crops are being studied by EWUP. The feasibility of improved practices can only be known by understanding the decision making environment of farmers. A farm record system adds to the understanding of the constraints and potentials faced by farm operators. The record system presented and analyzed here was developed to enhance the understanding of Egyptian farm management decisions. In that way, EWUP seeks to improve the income and social well-being of farmers through improved management of water and associated inputs on farms.

PROCEDURE

EWUP operates in three areas. The initial area selected was in Mansouria District of the Giza Governate near Cairo. A second site is near the Abu Raia village in the Kafr El Sheikh Governate. The third site is up river from Cairo at Abu Korkas village, El Minia Governate (see the location map Figure 1).

At each of the three areas of the project some farms were selected for intensive study by the economics team. The farms were selected based on the following criteria:

1. Location with respect to source of water.
2. Irrigation system and methods.
3. Soil types.
4. Ownership and other social aspects.
5. Crops.
6. Shape and leveling of the fields.

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[9]Abu-Zeid, Mahmoud, op. cit.

7. Conditions of water delivery.

FARM RECORDS DESIGN

A record was to be kept on a select number of farms. First, it was necessary to design a simple farm record book which could provide the information needed for future planning. The main reasons for having our record system are:

1. To measure financial success and progress of the business over time.
2. To aid in planning for the future.
3. To determine the constraints under which the farmer operates.
4. To know the more beneficial enterprises.

Farm record keeping was initiated at the Mansouria site and the Abu Raia site during 1978 and 1979.

Since most cooperating farmers are illiterate, study case farmers were visited at least once every two weeks by EWUP economists to accurately record the data needed. The accounting period was from November 1, 1978, to October 31, 1979. Appendix I at the end of this paper presents the main chapters in our farm record and its summary.

Efficiency Ratios. Comparative analyses of farm record data involves the direct comparisons of resources and resource use, incomes and expenses between farms. It is also useful to calculate ratios to evaluate the efficiency of resource use and make between-farm comparisons of these ratios. These ratios have been developed in farm management literature and, as a consequence, are biased towards comparisons which are most useful to analysis of highly commercialized farming systems such as found in western countries. Meaningful ratios must be developed for Egyptian agricultural conditions.

Efficiency ratios permit a number of comparisons. The relative contribution of crops versus livestock to gross and net farm income is one such comparison. Given the mixed crop-livestock farming systems in Egypt, this ratio would seem useful for analytical purposes. But, livestock contribute value other than through direct sales to farms in Egypt. They are multi-purpose, serving as transportation, power for tillage and irrigation pumping, providing milk and meat for home consumption, and contributing manures which are valued for fertilizer. Values must be assigned to these non-market uses of livestock so that their role on Egyptian farms can be more adequately appraised.

In Egypt it is important to consider the intensity of land use. Farmers grow more than one crop on a given piece of land during a year; the national average is about two crops per year. Intercropping is also practiced. Measures of land use efficiency must be developed to consider both the number of feddans of crops harvested relative to the number of feddans of land in the farm and the value of harvested crops per feddan of land.

A variety of income ratios are used. One such ratio is that of gross returns relative to total capital managed. On owner operated farms this ratio will provide comparison of the efficiency of capital use. Farmers with greater land use intensities and producing higher-valued crops would be expected to have larger ratios of gross returns per amount of capital managed. Renters would be expected to have greater gross return-capital managed ratios than owners since they avoid the sizable investments in land.

Gross returns per unit of expense also measure income efficiency as do income per unit of cropland and income per farm laborer. These appear relevant to the analysis of Egyptian farmers as well. Because EWUP is concerned with

on-farm water management, gross returns per unit of water applied would also be an important efficiency ratio for analysis of Egyptian farms. However, measures of water applied per farm are not available. As the work on EWUP progresses, such water measurement data may become available so that between farm comparisons of gross returns per unit of water applied would be possible.

The efficiency at which crops are produced on farms are also useful comparisons. Crop yields are an obvious measure but the distribution of crops grown may also relate to farm income. Similar to the ratio of gross returns to total expenses, the ratio of gross returns from crops to crop expenses can provide a comparison of efficiency in crop production among farms.

Measures of livestock efficiency can be constructed in a manner similar to those for crops. Livestock returns per unit cost of feed is a common measure; however, when much of the feed is produced on the farms values must be assigned to the feed.

Farm management analyses often consider machinery and equipment efficiency. In highly commercialized agricultural systems machinery efficiency measures are used to indicate possible over-investments or under-investments in machinery and equipment. Value of output relative to the amount of machinery and equipment investment and machinery and equipment investment per unit of land or per laborer are commonly used efficiency measures. In Egypt, relatively small machinery and equipment investments are made by farmers. Even so, substantial differences in the extent of such investments occur between farms. It will be useful to explore possible associations between machinery and equipment investments and farm income.

I. FARM RECORDS SUMMARY AND ANALYSIS AT MANSOURIA SITE

Mansouria District is irrigated by Mansouria Canal which has a length of 37 Km. Two distinct research areas are being studied at the Mansouria site; one is an area of clay-loam soils irrigated by the Bani-Magdoul branch canal and the other area has sandy soils which are irrigated by the El Hammami branch canal (see Figure 3). The total rotated area at Mansouria District is 24,745 F; 60 percent is occupied by orchards and 40 percent is cultivated with vegetables and other crops like berseem, wheat, flax and maize.

Land in this district slopes from south to north and from west to east. In general, 50 percent of the land has a water table of more than 150 cm, 45 percent has a water table from 80 cm to 150 cm, and 5 percent has a water table less than 80 cm. The depth to water in the project area ranges from 60 to 150 cm. The water table fluctuates during the season; it rises immediately after each irrigation and declines between irrigations, but usually a gradual build up occurs during the season. During the season the rate of decline of the water table between irrigation is greatest during the period of highest consumptive use suggesting that declines occur both from lateral outflow and from water use by plants from the groundwater.

The soil moisture extractions are from 4 to 8 Mho. and some areas with salinity problems are from 8 to 16 Mho.

Farmers in the Mansouria District irrigate as if their fields have zero grade level.[10] Water is introduced into a bonded unit until the area is covered and is allowed to stand and infiltrate into the soil. This practice is followed in both the sandy soil of El Hammami and the clay loam of Bani-Magdoul.

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[10] El Kady, op. cit.

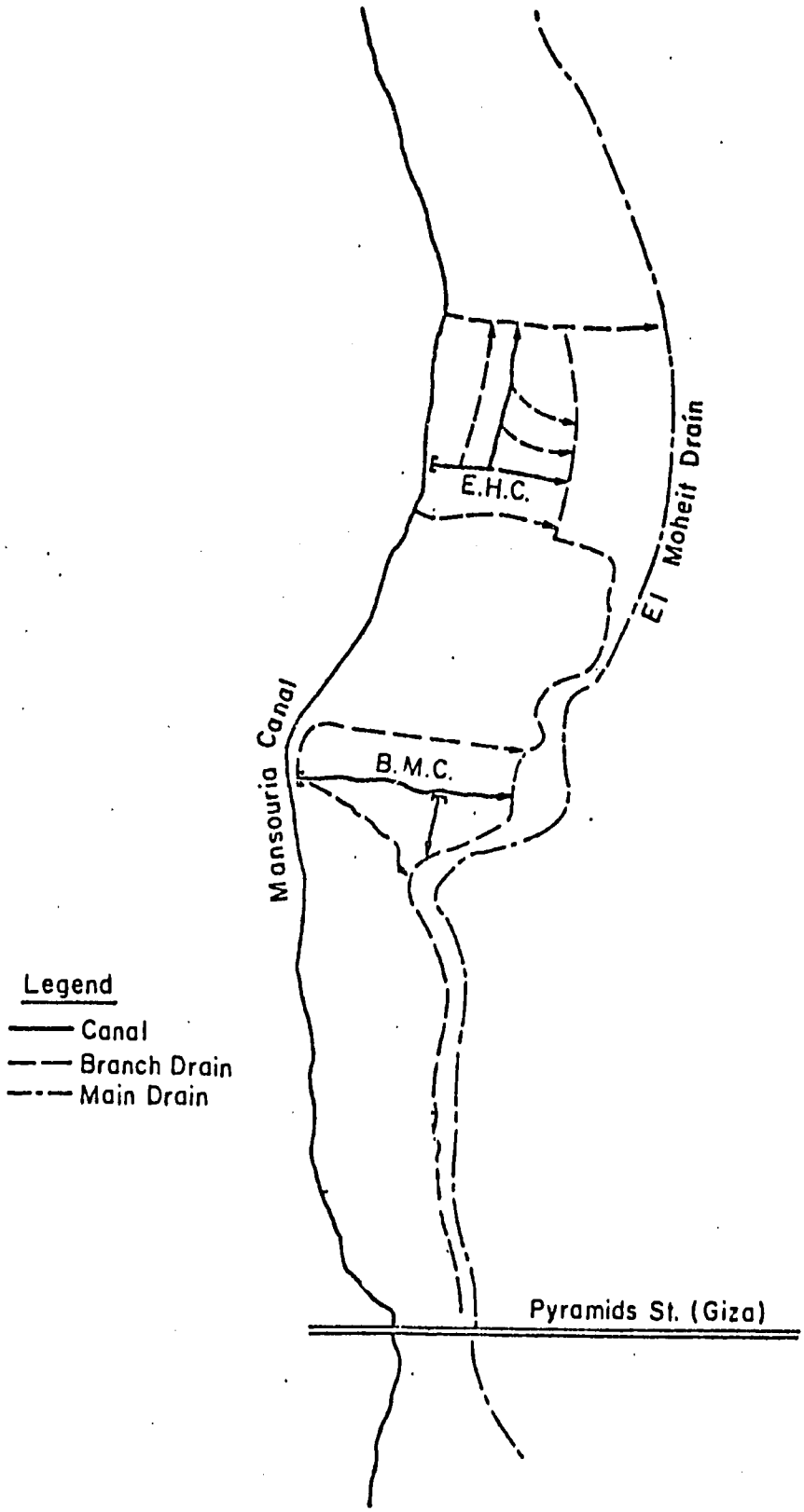

Figure 3. Location map for Beni Magdoul (B.M.C.) and El Hammami (E.H.C.) branch canals in Mansouria District.

I. (A) FARM RECORDS SUMMARY AND ANALYSIS AT BANI-MAGDOUL SITE MANSOURIA DISTRICT

Representative sites on two branch canals (El Hammami and Bani-Magdoul) were selected for the study (see location map Figure 3). The selection of These sites were based on agronomic, engineering, and socio-economic criteria. All fields on a selected site were monitored at every irrigation. In addition, socio-economic, crop production, and soils data were collected. Since the two sites (El Hammami and Bani-Magdoul) have different soil types, their farm records summary are shown separately.

Included in Table 4 is the number of persons in the farmers family. Egyptian farm family members all become involved in the farming operation. The father works in the field with the assistance of his sons, even those who are in school. School-age sons assist their father after the school day and during their vacations especially in critical times like planting, insecticide applications, and harvesting operations. The mother, in addition to her daily home work, takes care of poultry, converts milk into cheese, butter, and non-fat milk, and helps in some light farm work (planting or transplanting and harvesting) and does some marketing at the village local market.

Land values at the Mansouria site are high because of its location near Giza City. The values vary according to the location; Bani-Magdoul land is more highly valued than that at El Hammammi. The land which is located by the main roads is very high in value; one feddan located along the Mansouria main road is valued at 30,000 L.E. and one feddan located at Bani-Magdoul road is valued at 15,000 L.E. The land values given in Table 4 are estimated by the farmers as are livestock values.

Table 4
Land, Labor and Livestock on Study Cases Farmers at Bani-Magdoul Site - Farm Records (1978-1979)

Farm No.	Family Members			Area			Livestock								Land and Livestock Total Value L.E.	Area Feddan 00.00
	Male	Female	Total	F*	K*	Total Value L.E.	Cow	Buffalo	Calves	Donkey	Camel	Goats	Poultry	Total Value L.E.		
1	5	2	7	3	6	Only Rented Land	1	1	-	2	-	-	-	620	620	3.25
2	4	3	7	1	8	16,000	1	1	-	1	-	-	44	652	16,652	1.33
3	5	3	8	1	12	Only Rented Land	-	1	-	1	-	-	-	320	320	1.50
4	4	3	7	2	18	Only Rented Land	1	1	-	1	-	3	15	717	717	2.75
5	6	4	10	1	18	12,000	-	2	-	1	-	-	33	680	12,680	1.75
6	3	3	6	1	22	25,000	-	3	-	1	-	-	2	680	25,680	1.92

* 1 Feddan = 24 K. (Kerat)

Table 5. Value of Investments in Land and Livestock per Feddan, Bani-Magdoul

Farm No.	Value of: Land/feddan	Livestock/feddan
	(L.E.)	
1	n.a.	191
2	12,030	490
3	n.a.	213
4	n.a.	261
5	6,857	389
6	13,321	354
Average	10,736	316

Differences occur between owned and rented farms in the amount of livestock investments per feddan. Owner-operated farms tend to have greater amounts of livestock per feddan than rented farms. This may be due to the fact that renters must meet fixed cash rent payments and do so by emphasizing cash crops rather than using land to grow crops for livestock feed. Subsequent analyses of cropping patterns will be examined to see if this pattern holds.

Table 6 illustrates the crop mix for the study case farms. Berseem represents 74 percent of the winter crops total area because berseem is the main livestock feed in winter. Almost all summer crops are vegetables which are sold as cash crops. The farmers at Mansouria site prefer to cultivate these cash crops since they supply the central market at Cairo and Giza City.

Differences in cropping intensities are seen in Table 7. Two farms, both of which are rented, have cropping intensities of less than two. Farm Number 2 has a cropping intensity of over 3 and Farm 4 has a cropping intensity of 2.5. The cropping intensity differences occur in both the winter and summer cropping systems. If farms have cropping intensities greater than two, the additional crops are grown during the summer season; perhaps as short season vegetables or on an intercropping basis.

Table 6
Crop Mix for the Study Cases at
Bani-Magdoul Site - Farm Records (1978-1979)

Farm No.	Total Area Feddan	Crops Cultivated Area F.															
		Berseem	Wheat	Flax	Tomatoes	Cabbage	Eggplant	Squash	Cucumber	Parsley	Gargir	Sun Flower	Dill	Onion	Sesame	Maize	Maize Forage
1	3.25	1.92	0.94	-	-	0.59	-	0.25	0.58	0.75	-	-	-	-	-	0.50	0.42
2	1.33	1.33	-	-	-	-	-	-	-	-	0.67	-	-	-	-	1.33	0.8
3	1.50	0.88	-	-	-	-	-	-	-	0.34	0.29	-	0.50	-	-	0.25	0.17
4	2.75	2.05	0.3	0.4	-	0.1	0.3	-	-	-	0.3	1.3	-	-	-	0.9	1.30
5	1.75	1.37	0.38	-	-	0.13	-	-	0.38	-	-	-	-	0.38	-	0.63	0.25
6	1.92	1.72	0.20	-	-	-	-	-	0.21	-	-	0.29	-	-	0.92	0.29	0.21

Table 7. Cropping Intensity; Crops Cultivated per Feddan of Land, Total and by Season

Farm No.	Feddans of Crops Cultivated feddan of land	Winter Crops feddan	Summer Crops feddan
1	1.8	.9	.9
2	3.1	1.0	2.1
3	1.6	.6	1.0
4	2.5	1.0	1.5
5	2.0	1.0	1.0
6	2.0	1.0	1.0
Average	1.9	.9	1.0

In Table 8 it is seen that important amounts of crops are used for home consumption and livestock feed. However, except for one case sales exceed 50 percent of the total value of crops produced. Livestock also contribute to home consumption. In fact, in many instances the value of home consumption of livestock products exceeds the value of sales. These figures cannot be given direct interpretation in any one year, however, as inventory increases and decreases in a year may cause distortions in the value of home use versus value of livestock product sales accounts.

The values of home produced versus purchased feeds for livestock are also shown in Table 8. Most farmers rely heavily on home produced feeds for livestock although all study farms purchase some feed.

Table 9 represents the summary of crop and livestock production. From this table the relative contribution which crops and livestock make to the total value of farm production can be computed. On the average 70 percent of total production value comes from crops and 30 percent from livestock. The production value is actual price which the farmers receive from selling their production at the market. For the products which are used at home, values are

Table 8
Summary of Crop and Livestock Production at
Bani-Magdoul Site - Farm Records (1978-1979)

Farm No.	Production and Disposition of Crops				Production and Disposition of Livestock						
	Fed to Livestock L.E.	Home Use L.E.	Sales L.E.	Production Total Value L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.	Non Purchased Feed L.E.	Purchased Feed L.E.	Purchased and Non Purchased Feed L.E.	Gain Over* All Feed Cost L.E.
1	171	-	921	1092	171.5	182.7	354.2	171	113	284	70.20
2	401	136.3	370	907.3	136.6	65.9	202.5	401	144	545	-342.5
3	58.5	-	572	630.5	183.6	87.3	270.9	58.5	86	144.5	126.4
4	285	17	846.1	1148.1	154.3	98.6	253.4	285	188	473	-219.6
5	249	38.5	336.1	623.6	116.7	392.7	509.4	249	141	390	119.4
6	54	36	571.8	661.8	77.3	492.3	569.5	54	239	293	276.5

* Gain over all feed costs is negative in Farm #2 and #4. We did not compute the animal power value which is used in farm operations in this table.

Table 9

Relative Contribution of Crops and Livestock to Total Production Values, Value of Crops to Livestock Production and Value of Home Consumption of Crops and Livestock

Farm No.	Crop Production Value L.E.	Livestock Production Value L.E.	Total Production Value L.E.	Crops Percent	Livestock Percent	Percent of Crops: Fed To Livestock	Percent of Crops: Consumed At Home	Percent of Livestock Products Consumed at Home
1	1092	354.2	1446.2	76	24	16	0	48
2	907.3	202.5	1109.8	82	18	44	15	67
3	630.5	370.9	901.4	70	30	9	0	68
4	1148.1	253.4	1401.5	82	18	25	1	61
5	623.6	509.4	1133	55	45	40	6	23
6	661.8	569.5	1231.3	54	46	8	5	14
TOTAL	5063.3	2159.9	7223.2	70	30			
AVERAGE						24	4	39

determined according to the market price minus transportation and marketing cost.

Livestock consume important amounts of the value of crop production. On the average, 24 percent of the value of crops is consumed by livestock on the farm. This percentage ranges from 8 to 44. Only relatively small amounts of crops are consumed at home; on the three rented farms, very little home consumption of crops took place. Livestock do contribute importantly to home consumption. About 39 percent of the value of livestock production is for home consumption.

Tables 10, 11, and 12 present the ratios of livestock production divided by livestock feed expenses with and without livestock work value. The work values are estimated according to their opportunity cost taken as the rental payment for livestock for the work option in question. The value of livestock production relative to the total value of feed shown in Table 10 shows the differences which may occur due to changes in inventories of livestock and the value of work done by livestock. On two farms the value of livestock sales is about 50 percent or less than the value of livestock feed used. Table 11 places a value on the work done by livestock. The value of work done by livestock ranges from 13 to 42 percent of the total value of livestocks contribution. On Farms 5 and 6, which had sizable livestock sales, the value of work contributed by livestock is relatively less than on the other farms. On each of the first four farms, the value of livestock for home consumption and work performed exceeds the value of sales of livestock products. On the average, over half of the value of livestock is in their value for home consumption and work contribution; this is about equally divided between home consumption and work.

Table 10
Number of Livestock by Species, Work Done by Livestock and
Ratio of Livestock Production (Not Including Work Value) ÷ L.S. Feed Expenses
for the Study Cases at Bani-Magdoul Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock				Working Hours Done by L.S.					L.S. Production ÷ L.S. Feed Expenses		
		Cow	Buffalo	Calves	Donkeys	Transportation*	Plowing	Leveling	Puddling	Turning Sakia**	Purchased and Non Purchased Feed L.E.	Total Value of L.S. Production L.E.	L.S. Production ÷ L.S. Feed Expenses
1	3.25	1	1	-	2	700	40	-	-	541	284	354.2	1.25
2	1.33	1	1	-	1	350	20	-	-	194	545	202.5	0.37
3	1.50	-	1	-	1	350	20	-	-	319	144.5	270.9	1.87
4	2.75	1	1	-	1	350	30	-	-	383	473	253.4	0.54
5	1.75	-	2	-	1	350	30	-	-	310	390	509.4	1.31
6	1.92	-	3	-	1	350	15	-	-	144	293	569.5	1.94

* Transportation and loading done by donkey. We assume that the minimum is 350 h. per year for 1 donkey

** Cows, buffalo and donkeys [illegible] turning sakia. [illegible]

Table 11
Value of Work Done by Livestock and Total Value of Livestock Production for Bani-Magdoul Study Cases (1978-1979)

Farm No.	Area Feddan	No. of L.S.				Value of Work Done by Livestock							Value of Livestock Production, from Home Use and Sales L.E.	Total Value of Livestock Production L.E.
						Transportation			Plowing & Turning Sakia			Work Value L.E.		
		Cow	Buffalo	Calves	Donkeys	Hours	Value* per Hour L.E.	Value L.E.	Hours	Value** per Hour L.E.	Value L.E.			
1	3.25	1	1	-	2	700	0.15	105	691	0.225	155.5	260.5	354.2	614.70
2	1.33	1	1	-	1	350	0.15	52.5	214	0.225	48	100.5	202.5	303.0
3	1.50	-	1	-	1	350	0.15	52.5	339	0.225	76.3	128.8	270.9	399.7
4	2.75	1	1	-	1	350	0.15	52.5	413	0.225	92.9	145.4	253.4	398.8
5	1.75	-	2	-	1	350	0.15	52.5	340	0.225	76.5	129	509.4	638.4
6	1.92	-	3	-	1	350	0.15	52.5	159	0.225	36	88.5	569.5	658.0

* The opportunity cost for 1 donkey hour is 0.15 L.E.
** The opportunity cost for 1 cow or buffalo hour is 0.30 L.E. Since the farmers used both donkey and cow or buffalo in plowing and turning sakia the opportunity cost = (0.30 + 0.15) ÷ 2 = 0.225 L.E.

Table 12
Ratio of Livestock Production (Including Work Value) ÷ L.S. Feed Expenses for the Study Cases at Bani-Magdoul Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock					Livestock Production Value			Purchased and non Purchased Feed L.E.	Ratio of L.S. Production ÷ L.S. Feed Expenses
		Cow	Buffalo	Calves	Donkey	Poultry	Value of Work Done by L.S. L.E.	Value of L.S. Production Home Use & Sales L.E.	Total Value L.E.		
1	3.25	1	1	-	2	-	260.5	354.2	614.7	284	2.16
2	1.33	1	1	-	1	44	100.5	202.5	303.0	545	0.56
3	1.50	-	1	-	1	-	128.8	270.9	399.7	144.5	2.77
4	2.75	1	1	-	1	15	145.4	253.4	398.8	473	0.84
5	1.75	-	2	-	1	33	129	509.4	638.4	390	1.64
6	1.92	-	3	-	1	2	88.5	569.5	658.0	293	2.25

The value of livestock production in relation to the value of farm-produced and purchased feeds are shown in Table 12. If the ratio of production value to feed expenses is less than one, as it is in two cases, livestock production value is not meeting even feed expenses. Because of changes in inventory from year-to-year, however, it is not meaningful to reach any conclusions from one year's data. Livestock consuming feed in one year and sold in a subsequent year could cause the ratio of production value to feed expense to be less than unity.

Table 13 is the summary of net farm income. All study farms served by the Bani-Magdoul canal show a positive net farm income. Notice that inventory changes are large on Farms 2 and 4 indicating that the low ratios of total livestock value to the value of feed is explained by inventory build-up.

Table 14 represents the average value of production per feddan and the average net farm income per person. The average value of crops produced per feddan varies considerably between farms. There maybe some tendency towards a greater value of crop output per feddan on small farms than on large farms. There are too few observations in this set of study farms to reach any such conclusion, however. The value of livestock production is more uniform than for crops; the two larger farms do have smaller livestock values per feddan than the smaller farms.

Average net farm income per feddan varies considerably between farms ranging from 146.6 L.E. to 609.9 L.E. The higher ratios of net farm income per feddan are associated with farms which have the higher values of livestock production per feddan; again, inventory changes may distort actual relationships.

Table 15 provides some insight into between differences in net income; low net farm income per person is directly associated with small amounts of land per

Table 13
Summary of Net Farm Income at Bani-Magdoul Site
Farm Records (1978-1979)

Farm No.	Summary of Income						Summary of Expenses						Net Farm Income
	Animal Products L.E.	Crop Products L.E.	Capital Sales L.E.	Inventory Changes if (+) L.E.	Off Farm Income L.E.	Total Gross Income L.E.	Crop Expenses L.E.	Non Crop Expenses L.E.	Capital Purchases L.E.	Inven-tory Changes if (-) L.E.	Non Purchased Livestock Feed L.E.	Total Gross Expenses L.E.	
1	354.2	1092	00.0	254	00.0	1700	392	313	00.0	00.0	171	876	** 824
2	203	907	00.0	3957	00.0	5067	259	214	00.0	00.0	401	872	*4195 ** 195
3	271	747	00.0	00.0	00.0	1018	276	186	00.0	16	00.0	478	** 540
4	253	1148	00.0	6899	00.0	8300	225	380	00.0	00.0	285	890	** 410
5	509	624	00.0	5120	00.0	6259	135	141	00.0	00.0	249	525	*5734 ** 934
6	570	662	00.0	1392	00.0	2624	222	344	00.0	00.0	54	620	*2004 **1171

* N.F.I. including land appreciation ** N.F.I. without land appreciation

Table 14
Average Value Production per Feddan and Average Net Farm Income per Person at Bani-Magdoul Site Farm Records (1978-1979)

Farm No.	Total Family Members	Area Feddan	Average Crop Prod/F.		Average Livestock Prod/F.		Net Farm** Income Value L.E.	Average Per Feddan L.E.	Average N.F.I. Per Person L.E.
			Crop Production Value L.E.	Average Per Feddan L.E.	Livestock* Production Value L.E.	Average Per Feddan L.E.			
1	7	3.25	1092	336.0	354.2	109.0	824	253.5	117.7
2	7	1.33	907	681.9	203	152.6	195	146.6	27.9
3	8	1.50	747	498.0	271	180.7	540	360.0	67.5
4	7	2.75	1148	417.5	253	92.0	410	149.0	58.6
5	10	1.75	624	356.6	509	290.9	934	533.7	93.4
6	6	1.92	662	344.8	570	296.9	1171	609.9	195.2

* L.S. production without work done by L.S. value
** N.F.I. without land appreciation

Table 15
Ratio of N.F.I. per Feddan and per Person ÷ Average N.F.I.
for the Study Cases at Bani-Magdoul Site (1978-1979)

Farm No.	Family Members	Area Feddan	Ratio of NFI/Feddan ÷ Average NFI/Feddan			Ratio of NFI/Person ÷ Average NFI/Person		
			N.F.I. Per Feddan L.E.	Average N.F.I. Per Feddan L.E.	Ratio Col. 1 ÷ Col. 2	N.F.I. Per Person L.E.	Average N.F.I. Per Person L.E.	Ratio Col. 4 ÷ Col. 5
1	7	3.25	253.5	325.9	0.78	117.7	90.5	1.30
2	7	1.33	146.6	325.9	0.45	27.9	90.5	0.31
3	8	1.50	360.0	325.9	1.10	67.5	90.5	0.75
4	7	2.75	149.0	325.9	0.46	58.6	90.5	0.65
5	10	1.75	533.7	325.9	1.64	93.4	90.5	1.03
6	6	1.92	609.9	325.9	1.87	195.2	90.5	2.16

person; although, some farms exhibit more success with intensification (producing more per unit of land) than others.

From Table 16 the relationships between working capital assets and the value of farm production are seen. It does appear that the value of farm production is positively associated with the value of working capital assets. But, by examining Tables 16 and 17 together it appears as though additional investments in working capital per feddan do not necessarily bear fruit in a greater value of farm production per amount of working capital. That is, capital intensification does not appear to be the key to increasing the value of agricultural production per feddan on this set of study farms.

Farm analysis is the climax of any record-keeping activity. It is important to use the same measurements from year to year so that the comparison will be meaningful over time. This was the first time for analyzing the farm study case data, plans are to use at least some of the same measurements in future years.

Analyses to measure efficiency involve comparative analysis. The comparisons can be between farms and/or between years. This year between farm comparisons are made for each individual study case net farm income (NFI) with the average NFI for the total study cases. Table 15 illustrates that in future year's between-year comparisons can be made.

Table 14 presents the ratio of the value of farm production divided by the value of working capital assets. Since not all of our study cases own the land, it was necessary to depart from fixed asset ratios to avoid the high appreciation of land value.

Table 15 shows the ratio of working capital assets divided by number of feddans and finally Table 16 illustrates the ratio of value of crops divided by crop expenses.

Table 16
Ratio of Value of Farm Production ÷ Working Capital Assets
for the Study Cases at Bani-Magdoul Site (1978-1979)

Farm No.	Area Feddan	Total Assets Value at the Beginning of the Year					Total Value at the End of the Year L.E.	Average Value of Assets L.E.	Farm Production Value L.E.	Ratio of Farm Production / Capital Assets
		Equipment Value L.E.	Livestock Value L.E.	Poultry Value L.E.	Grain and Forage Value L.E.	Total Value L.E.				
1	3.25	70	620	00.0	6.5	696.5	950	823	1446	1.76
2	1.33	300	550	102	22	974	931	952	1110	1.17
3	1.5	00.0	320	00.0	35.5	355.5	340	348	901	2.59
4	2.75	269.5	695	22.5	92.1	1079.7	979	1029	1401	1.36
5	1.75	80	640	40	54	814	1139	976	1133	1.16
6	1.92	30	655	15	32	732	1291	1011	1231	1.22

Table 17
Ratio of Working Capital Assets Value ÷ No. Feddans
for the Study Cases at Bani-Bagdoul Site (1978-1979)

Farm No.	Area Feddan	Working Assets Value at the Beginning of the Year L.E.	Working Assets Value at the End of the Year L.E.	Average Value of Working Assets L.E.	Ratio of Working Assets ÷ Area (Feddan)
1	3.25	696	950	823	253.23
2	1.33	974	931	952	715.79
3	1.5	355	340	348	256.00
4	2.75	1079	979	1029	374.18
5	1.75	814	1139	976	557.71
6	1.92	732	1291	1011	526.56

Earlier it was shown that on some farms the value of livestock production is exceeded by the value of livestock feed. Table 18 presents similar data for crops. The value of crop production relative to the value of crop expenses is always greater than one.

Table 18
Ratio of Value of Crop Production ÷ Crop Expenses
for the Study Cases at Bani-Magdoul Site (1978-1979)

Farm No.	Area Feddan	Value of Crop Production				Total Crop Expenses L.E.	Ratio of Value of Crop Production ÷ Crop Expenses
		Livestock Feed L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.		
1	3.25	171	00.0	921	1092	391	2.79
2	1.33	401	136	370	907	257	3.53
3	1.5	58	00.0	572	360	251	1.43
4	2.75	285	17	846	1148	225	5.10
5	1.75	249	38	336	623	135	4.61
6	1.92	54	36	572	662	222	2.98

I. (B) FARM RECORDS SUMMARY AND ANALYSIS AT EL HAMMAMI SITE MANSOURIA DISTRICT

Table 19 shows the number in the farmers family. As for Bani-Magdoul, all members become involved in the farming operation. Since El Mansouria site lies near El Giza City and Cairo, many farm laborers move to these two big cities for employment in construction, industrial work, or commercial business. Even school-age sons often seek jobs at these two big cities.

The land value at El Hammami site is lower than Bani-Magdoul site. Likely, this is because El Hammami lies at a slightly greater distance from Cairo. The land values given in Table 19 are estimated by the farmers as are livestock values. None of the farms on which records are kept at the El Hammami site are rented. Farms are larger, on the average, than at Bani-Magdoul; but, this is primarily because of one relatively large farm which is included in the study.

The value of land per feddan is only about one-third of the per feddan land value in the Bani-Magdoul study site (Table 20). The El Hammami study farms have only one half of the investment in livestock per feddan (L.E. 158/F.) of the Bani-Magdoul farms.

Table 21 gives the crop mix for the study case farms. Berseem is the most important winter crop and maize forage an important summer crop; both are mainly used for livestock feeding in winter and summer, respectively. Aside from these two crops it is difficult to identify summer crops and winter crops in this area. Orientation of crops towards the Cairo market makes this region rather unique. Vegetables are the primary cash crop in this area and are capable of producing a high return.

By comparing Tables 7 and 22 it is seen that land use intensities are less for the El Hammami farms than for the Bani-Magdoul farms. By comparing Tables 20 and 21 it can be seen that using the land to produce forage for livestock

Table 19
Land, Labor, and Livestock on the Study Cases Farms at
El Hammami Site - Farm Records (1978-1979)

	Family Members			Area			Livestock								Land and Livestock Total Value L.E.	Area Feddan 00.00
	Male	Female	Total	F*	K*	Total Value L.E.	Cow	Buffalo	Calves	Donkey	Camel	Goats	Poultry	Total Value L.E.		
	5	5	10	2 -	1 10 R	8166	-	-	-	1	1	-	30	358	8524	2.46
	7	5	12	-	11	2000	-	-	-	1	-	2	5	94	2094	0.46
	6	12	18	2	18	13500	1	-	-	1	-	1	15	277	13777	2.75
	17	14	31	7 6	6 14 R	53400	5	2	4	2	1	-	-	1890	55290	13.30
	2	1	3	- -	12 21 R	2500	-	-	2	1	-	2	25	272	2772	1.38

* 1 F. (feddan) = 24 K. (kerat) R = rented land

Table 20
The Value of Investments in Land and Livestock per Feddan, El Hammami

Farm No.	Value of:	
	Land/F.	Livestock/F.
1	3,320	146
2	4,348	204
3	4,909	101
4	4,015	142
5	1,812	197
Average	3,681	158

Table 21
Crop Mix for the Study Cases at El Hammami Site
Farm Records (1978-1979)

Farm No.	Total Area Feddan	Crop Cultivated Area per Feddan														
		Berseem	Wheat	Squash	Tomatoes	Hot Pepper	Cabbage	Okra	Eggplant	Onion	Sunflower	Peanut	Mellons	Jews Mellon	Maize	Maize Forage
1	2.46	0.90	0.46	0.58	0.54	0.46	0.54	-	-	0.08	-	-	-	-	0.42	0.92
2	0.46	0.46	-	-	-	-	-	0.20	-	-	-	-	-	0.16	-	0.10
3	2.75	0.67	0.50	0.25	0.50	1.58	0.58	-	-	-	0.33	0.67	-	-	0.25	1.00
4	13.30	3.00	1.70	0.50	2.50	2.30	-	-	0.80	-	-	-	1.30	-	1.80	2.50
5	1.38	0.58	-	-	-	1.38	-	-	-	-	-	-	-	0.80	0.58	0.63

Table 22
Cropping Intensity, Crops Cultivated
Per Feddan of Land, Total and by Season

Farm No.	Crops Cultivated/ Feddan	Winter Crops/ Feddan	Summer Crops/ Feddan
1	2.0	1.0	1.0
2	2.0	1.0	1.0
3	2.3	1.0	1.3
4	1.2	.6	.6
5	2.9	1.0	1.9
Average	1.6	.7	.9

requires a much higher percentage of available land on the small farms than on larger sized farms.

In Table 23 it is seen that a relatively high proportion of the total value of crops produced are sold off the farm. For the one small farm (No. 2), because such a large amount of available land must be used to produce forage for livestock, sales of crops represent only about 35 percent of the total value of crops. On this farm all of the value of livestock is represented in sales; the donkey is "rented out" to provide income to the small farmer.

On four of the five farms the value of purchased and non-purchased livestock feeds exceeded the value of livestock. Home use of livestock tends to be a relatively important contribution from livestock in most cases. And, farm produced feed makes up most of the value of feed fed to livestock.

Table 24 shows the relative contribution that crops and livestock make to the total value of farm production. On the average, 80 percent of the total production value comes from crops and 20 percent from livestock. The production values are set by the actual prices which the farmers received from selling their production in the market.

Table 24 also shows that a slightly smaller percentage of crops are fed to livestock on El Hammami farms than for the Bani-Magdoul study site. On the other hand, a large percent of the value of livestock products are consumed at home among the El Hammami farms. Livestock values are small on the El Hammami farms leaving a smaller marketable surplus after home consumption needs are met.

Tables 25, 26 and 27 present the ratios of livestock production divided by livestock feed expenses with and without livestock work value. The work values are estimated according to the opportunity cost--that is, the going rate

Table 23
Summary of Crop and Livestock Production
El Hammami Site - Farm Records (1978-1979)

Farm No.	Production and Disposition of Crops				Production and Disposition of Livestock						
	Fed to Livestock L.E.	Home Use L.E.	Sales L.E.	Production Total Value L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.	Non Purchased Feed L.E.	Purchased Feed L.E.	Purchased and Non Purchased Feed L.E.	Gain Over All Feed Cost L.E.
1	59.5	16.4	739.4	815.3	189.9	230.4	420.3	59.5	63	122.5	297.80
2	39	7.4	25	71.4	00.0	20	20.0	39.0	8	47	-27.00
3	253	1.7	489.5	744.2	90	00	90	523	19	542	-452.00
4	554	6.7	3177.9	3738.6	455.5	305	760.5	554	262	816	-55.50
5	382	79.00	218	679	145.7	114	259.7	382	126	508	-248.30

Table 24
Relative Contribution of Crops and Livestock to Total Production Values, Value of Crops to Livestock Production and Value of Home Consumption

Farm No.	Crop Production Value L.E.	Livestock Production Value L.E.	Total Production Value L.E.	Crops Percent	Livestock Percent	Percent of Crops: Fed To Livestock	Percent of Crops: Consumed At Home	Percent of Livestock Products Consumed at Home
1	815.3	420.3	1235.6	66	34	7	2	45
2	71.4	20.0	91.4	78	22	55	10	0
3	744.2	90.0	834.2	89	11	34	0	100
4	3738.6	760.0	4498.6	83	17	15	0	60
5	679.0	259.7	938.7	72	23	56	12	56
Total	6048.5	1550.0	7598.5	80	20			
Average						21	2	57

Table 25
Number of Livestock by Species, Work Done by Livestock and Ratios of Livestock Production (Not Including Work Value) ÷ L.S. Feed Expenses for the Study Cases at El Hammami Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock					Working Hours Done by L.S.					L.S. Production ÷ L.S. Feed Expenses		
		Cow	Buffalo	Calves	Donkey	Camel	Transportation*	Plowing	Leveling	Puddling	Turning Sakia**	Purchased and Non Purchased Feed L.E.	Total Value of L.S. Production L.E.	L.S. Production ÷ L.S. Feed Expenses
1	2.46	-	-	-	1	-	350				238	122.5	420.3	3.43
2	0.46	-	-	-	1	-	350				94	47.0	20.0	0.43
3	2.75	1	-	-	1	-	350				433	542	90.0	0.17
4	13.30	5	2	4	2	-	700				532	816	760.0	0.93
5	1.38	-	-	2	1	-	350				163	508	259.7	0.51

* Transportation and loading done by donkey. We assume that the minimum is 350 h. per year for donkey.
** Donkey is used for turning sakia except cases #3 and 4. Cows and buffalo are used.

Table 26
Value of Work Done by Livestock and Total Value of Livestock Production for El Hammami Study Cases (1978-1979)

Farm No.	Area Feddan	No. of L.S.				Value of Work Done by Livestock							Value of Livestock Production, Home Use and Sales L.E.	Total Value of Livestock Production L.E.
						Transport			Turn Sakia			Work Value L.E.		
		Cow	Buffalo	Calves	Donkey	Hours	Value per Hour L.E.	Value L.E.	Hours	Value per Hour L.E.	Value L.E.			
1	2.46	-	-	-	1	350	0.15	52.5	238	0.15	35.7	88.2	420.3	508.5
2	0.46	-	-	-	1	350	0.15	52.5	94	0.15	14.1	66.6	20.0	86.6
3	2.75	1	-	-	1	350	0.15	52.5	433	0.30	129.9	182.4	90.0	272.4
4	13.30	5	2	4	2	700	0.15	105	532	0.30	159.6	264.6	760.0	1024.6
5	1.38	-	-	2	1	350	0.15	52.5	163	0.15	24.5	77.0	259.7	336.7

Table 27
Ratio of Livestock Production (Including Work Value) ÷ L.S. Feed Expenses for the Study Cases at El Hammami Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock							Livestock Production Value			Purchased and Non Purchased Feed L.E.	Gain Over All Feed Costs L.E.	Ratio of L.S. Production ÷ L.S. Feed Expenses
		Cow	Buffalo	Calves	Donkey	Camel	Goats	Poultry	Value of Work Done by L.S. L.E.	Value of L.S. Production Home Use & Sales L.E.	Total Value L.E.			
1	2.46	-	-	-	1	1	-	30	88	420.3	508.5	122.5	386	4.15
2	0.46	-	-	-	1	-	2	5	66.6	20.0	86.6	47.0	39.6	1.84
3	2.75	1	-	-	1	-	1	15	182.4	90.0	272.4	542	-269.6	0.50
4	13.30	5	2	4	2	1	-	-	264.6	760.0	1024.6	816	208.6	1.26
5	1.38	-	-	2	1	-	2	25	77.0	259.7	336.7	508	-171.8	0.66

for hiring such livestock work services are applied. On only one farm does the value of livestock production exceed the value of livestock feed expenses. The primary work value of livestock is for transportation and turning sakias. This set of farms reported no livestock use in field operations.

When the work-value of livestock is added to their contribution to home consumed items and sales values, the rationale for livestock's existence on farms becomes more apparent. The total value of livestock exceeds the value of livestock feed expenses in three of the five cases.

Table 28 is the summary of net farm income. Net farm income (ignoring land appreciation) is negative for the smallest farmer. Table 29 represents the average value of production per feddan and the average net farm income per person. The value of crops produced per feddan varies over a sizable range. Farm 5 has over three times as much crop value per feddan as does Farm 2. Only two farms produced a modest amount of income per person in 1978-79. For the others, income per person was either negative or extremely low. Comparing the average net farm income per feddan and per person from each of the study cases at El Hammami site to the average at Bani-Magdoul site (Table 14), it is seen that El Hammami has much lower income levels.

From Table 31 the relationships between working capital assets and the value of farm production are seen. It again appears that the value of farm production is positively associated with the value of working capital assets.

Tables 32, 33 show the ratio of working capital assets per feddan and the ratio of crop production value divided by crop expenses, respectively. The value of crop production exceeds the value of crop expenses in all cases. This ratio also appears to be related to farm size, measured in feddans of land.

Table 28
Summary of Net Farm Income at El Hammami Site
Farm Records (1978-1979)

Farm No.	Summary of Income						Summary of Expenses						Net Farm Income
	Animal Products L.E.	Crop Products L.E.	Capital Sales L.E.	Inventory Changes if (+) L.E.	Off Farm Income L.E.	Total Gross Income L.E.	Crop Expenses L.E.	Non Crop Expenses L.E.	Capital Purchases L.E.	Inven-tory Changes if (-) L.E.	Non Purchase Livestock Feed L.E.	Total Gross Expense L.E.	
1	420	815	830	3551	-	5616	278	93	400	-	60	831	*4785 ** 951
2	20	71	-	343	-	434	63	36	-	-	39	138	* 296 ** -4
3	90	744	182	2160	-	3176	383	19	134	-	253	789	*2387 ** 87
4	761	3739	-	9074	-	13574	1446	482	-	-	554	2482	*11092 ** 2292
5	260	679	-	497	-	1436	324	209	-	-	382	915	* 521 ** 21

* N.F.I. including land appreciation
** N.F.I. without land appreciation

Table 29
Average Value Production per Feddan and Average Net Farm Income per Person at El Hammami Site Farm Records (1978-1979)

Farm No.	Total Family Members	Area Feddan	Average Crop Prod/F.		Average Livestock Prod/F.		Net Farm** Income Value L.E.	Average NFI Per Feddan L.E.	Average NFI Per Person L.E.
			Crop Production Value L.E.	Average Per Feddan L.E.	Livestock* Production Value L.E.	Average Per Feddan L.E.			
1	10	2.46	815	331.3	420	170.7	951	386.6	95.1
2	12	0.46	71	154.3	20	43.5	-4	-8.7	-0.33
3	18	2.75	744	270.5	90	32.7	87	31.6	4.83
4	31	13.30	3937	296	761	57.2	2292	172.3	73.9
5	3	1.38	679	492	260	188.4	21	15.2	7

* L.S. production without work done by L.S. value
** N.F.I. without land appreciation

Table 30
Ratio of N.F.I. per Feddan and per Person ÷ Average N.F.I.
for the Study Cases at El Hammami Site (1978-1979)

Farm No.	Family Members	Area Feddan	Ratio of N.F.I. per Feddan ÷ Average N.F.I.			Ratio of N.F.I. per Person ÷ Average N.F.I.		
			N.F.I. Per Feddan L.E.	Average N.F.I. Per Feddan L.E.	Ratio Col. 1 ÷ Col. 2	N.F.I. Per Person L.E.	Average N.F.I. Per Person L.E.	Ratio Col. 4 ÷ Col. 5
1	10	2.46	386.6	164.5	2.35	95.1	45.2	2.1
2	12	0.46	-8.7	164.5	-0.05	-0.33	45.2	-0.01
3	18	2.75	31.6	164.5	0.19	4.83	45.2	0.11
4	31	13.30	172.3	164.5	1.05	73.9	45.2	1.63
5	3	1.38	15.2	164.5	0.09	7	45.2	0.15

Table 31
Ratio of Value of Farm Production ÷ Working Capital Assets
for the Study Cases at El Hammami Site (1978-1979)

Farm No.	Area Feddan	Total Assets Value at the Beginning of the Year					Total Value at the End of the Year L.E.	Average Value of Assets L.E.	Farm Production Value L.E.	Ratio of Farm Production ÷ Work Capital Assets
		Equipment Value L.E.	Livestock Value L.E.	Poultry Value L.E.	Grain and Forage Value L.E.	Total Value L.E.				
1	2.46	100	320	38	65	523	240	382	1236	3.24
2	0.46	35	80	14	-	129	172	150	91	0.61
3	2.75	174	247	30	70	521	381	451	834	1.85
4	13.30	1915	1890	-	245	4050	4324	4187	4499	1.07
5	1.38	150	225	47.5	9	431.5	428	430	939	2.18

Table 32
Ratio of Working Capital Assets Value ÷ No. of Feddans
for the Study Cases of El Hammami Site (1978-1979)

Farm No.	Area Feddan	Working Assets Value at the Beginning of the Year L.E.	Working Assets Value at the End of the Year L.E.	Average Value of Working Assets L.E.	Ratio of Working Assets ÷ Area/Feddan
1	2.46	523	240	382	155.28
2	0.46	129	172	150	326.09
3	2.75	521	381	451	164.00
4	13.30	4050	4324	4187	314.81
5	1.38	431	428	430	311.59

Table 33
Ratio of Value of Crop Production ÷ Crop Expenses
for the Study Cases at El Hammami Site (1978-1979)

Farm No.	Area Feddan	Value of Crop Production				Total Crop Expenses L.E.	Ratio of Value of Crop Production ÷ Crop Expenses
		Livestock Feed L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.		
1	2.46	59.5	16.4	739.4	815.3	277.6	2.94
2	0.46	39	7.4	25.0	71.4	63.1	1.13
3	2.75	253	1.7	489.5	744.2	382.5	1.95
4	13.30	554	6.7	3177.9	3738.6	1446.4	2.58
5	1.38	382	1.0	218.0	679	323.7	2.10

II. FARM RECORDS SUMMARY AND ANALYSIS AT ABU-RAIA SITE KAFR EL SHEIKH GOVERNATE

Background:

The Abu-Raia area is located in the North Delta and it lies to the South of El Broells Lake. This area is newly reclaimed land; it has been reclaimed for about fifty years. (See Abu-Raia Area map, Figure 4.)

The soil type is clay on the surface; the soil profile includes a heavy clay for from 40-60 cm and after that it is a loam soil. The area suffers from soil salinity and sodicity problems. A highly significant negative relationship exists between soil salinity and yields.

The water in canals is of high quality. The electrical conductivity of irrigation water averages about 0.54 millimhos for the period of measurement, with relatively low sodium. The water in drains has the range from 1.06 to 3.26 millimhos. The Gadalla drain is very highly saline and should not be used for irrigation if there is any other alternative.

The water table varies from 40-160 cm from land surface. The farmers near Abu-Raia as well as all Egyptian farmers have no modern methods available to guide their decisions about when to irrigate and how much to apply; modern techniques could perhaps increase their yields and reduce the water they apply. Improved water management might also effect a lowering of the water table and reduce the danger of excess moisture in the root zone.

Table 34 shows the numbers of individuals in the farmers family at Abu-Raia site. All the family members cooperate in the farming operation, particularly at critical times like transplanting rice nurseries, applying cotton insecticides, rice harvesting, and cotton picking.

The land value at Abu-Raia site ranges between 1500-2000 L.E. per feddan (Table 35); the land values given are estimated by the farmers as are livestock values.

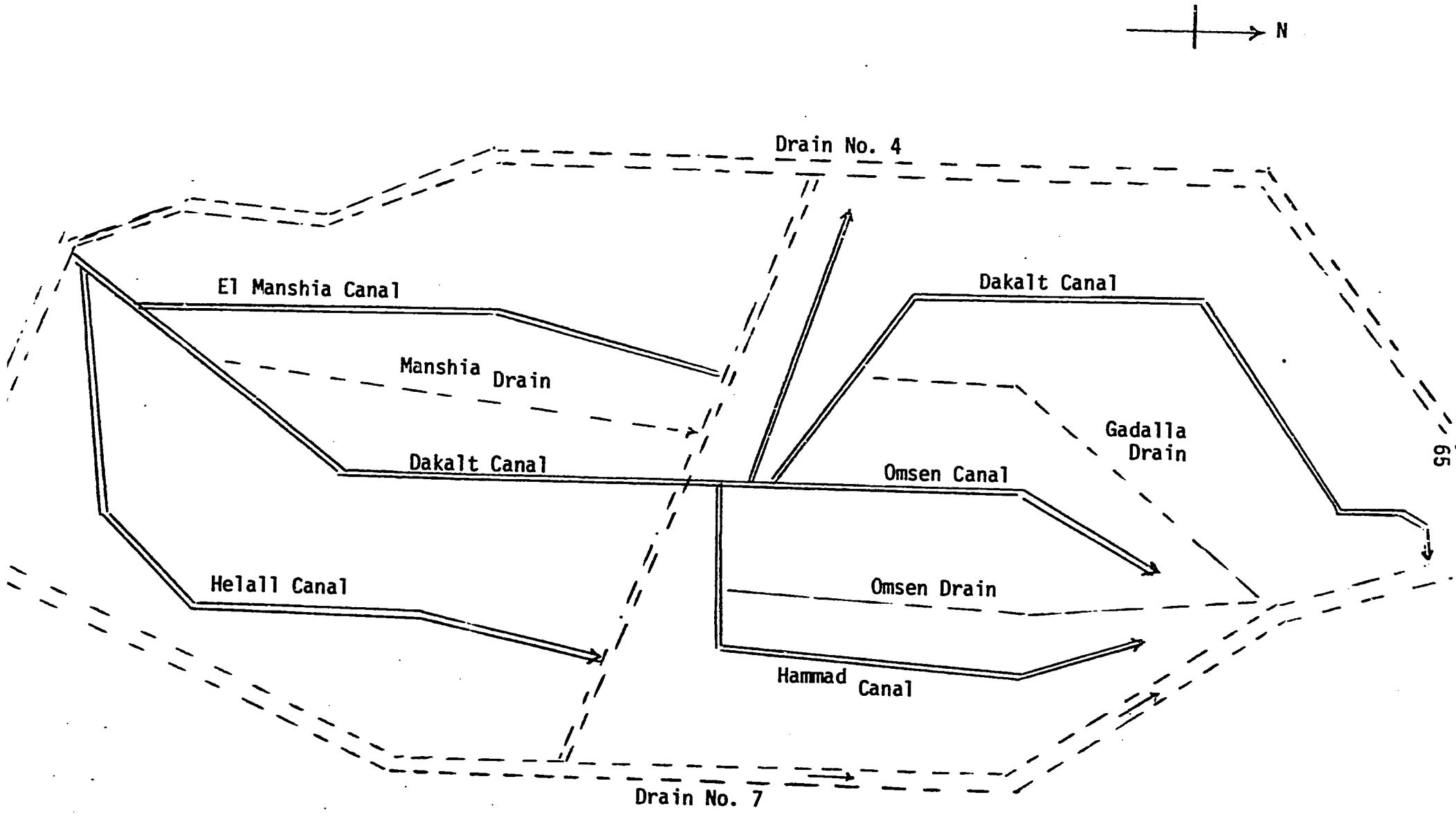

Figure 4. Map of Abu-Raia Area

Table 34
Financial Statement for Study Cases Farmers at
Abu-Raia Site - Farm Records (1978-1979)

Farms No.	Family Members			Area			Livestock								Land and Livestock Total Value L.E.	Area Feddan 00.00
	Male	Female	Total	F.*	K*	Total Value L.E.	Cow	Buffalo	Calves	Donkey	Camel	Goats	Poultry	Total Value L.E.		
1	6	3	9	6	9	11750	-	2	1	2	-	-	39	595	12345	6.38
2	2	4	6	6	19	13563	1	1	4	2	-	-	-	898	14481	6.79
3	7	11	18	8	8	14800	2	1	2	2	-	-	8	652	15452	8.33
4	4	4	8	2 0 1 R	12 12	5000	1	1	-	1	-	-	-	405	5405	4.00
5	4	6	10	4 0 2 R	16 -	8000	1	1	-	2	-	-	-	410	8410	6.67
6	6	2	8	10	18	21500	4	2	3	2	-	-	10	1864	23364	10.75
7	3	2	5	3	-	6600	-	2	2	1	-	-	22	809	7409	3.00

0 = owned R = rented land
* 1 feddan = 4200.8335 sq. meters = 1.0381 acre = 0.4201 hectar

Table 35
The Value of Investments in Land and Livestock per Feddan, Abu-Raia

Farm No.	Value of: Land/Feddan (L.E.)	Livestock/Feddan (L.E.)
1	1,842	93
2	1,997	132
3	1,777	78
4	1,250	101
5	1,199	61
6	2,000	173
7	2,200	270
Average	1,752	130

Land values per feddan are much lower at the Abu-Raia site than the two Mansouria Governate sites. Likely, the effects of urbanization on land values is not present at this location which is more distant from a major city. Additionally, the farmers at Abu-Raia are required to grow government established amounts of certain crops such as cotton, rice and wheat. They have less opportunity to produce high valued crops which may yield a greater return, thereby increasing land values.

The value of livestock owned per feddan is also lower at Abu-Raia than at Bani-Magdoul or El Hammami. Again, requirements to produce wheat during the winter season and cotton and rice during the summer may limit the amounts of berseem production and the size of livestock enterprises.

Table 36 illustrates the crop mix for the study case farmers. Berseem represents 51 percent of the winter crop because it is the main livestock feed in winter. Cotton represents 32 percent of the summer crops and rice represents about 50 percent. Cotton, rice and maize are the main summer crops at Abu-Raia site. Cropping intensities (Table 37) are a rather uniform rate; the overall intensity is 2.0 divided equally between winter and summer.

In Table 38 it is seen that farms at Abu-Raia are much more dependent on crops than on livestock for sources of income than is the case for the two sites discussed earlier. None of the seven Abu-Raia farms have livestock values which exceed livestock feed costs. Abu-Raia farms rely on purchased livestock feeds to a very limited extent.

Abu-Raia farmers feed about the same percentage of value of crops to livestock as is the case on farms at the other sites (Table 39). They consume slightly higher percentages of the value of their crops. It appears that the size of livestock enterprises is governed largely by the amounts required for

Table 36
Crop Rotation for the Study Cases at Abu-Raia Site
from Their Farm Records (1978-1979)

Farm No.	Winter Crops						Summer Crops						
	Barseem F.	Wheat F.	Flax F.	Broad Beans F.	Veg. F.	Maize Forage F.	Cotton F.	Rice F.	Maize F.	Maize Forage F.	Mellons Seeds F.	Tomatoes F.	Cucum-ber F.
1	4.10	1.60	0.70	-	-	-	2.90	2.80	0.70	0.3	-	-	-
2	3.10	2.70	1.00	-	-	-	-	4.70	1.00	-	-	0.50	0.60
3	3.40	2.70	1.50	0.80	-	-	2.00	5.20	0.70	0.30	0.20	-	-
4	2.00	1.00	1.00	-	-	-	1.50	2.50	-	-	-	-	-
5	3.30	1.80	1.30	0.30	-	-	2.90	1.80	1.50	0.40	0.10	-	-
6	5.30	1.50	3.00	-	-	1.00	4.30	5.00	0.50	1.00	-	-	-
7	2.00	1.00	-	-	-	-	1.00	1.00	1.00	-	-	-	-

Table 37
Cropping Intensity, Crops Cultivated
Per Feddan of Land, Total and by Season

Farm No.	Crops Cultivated/ Feddan of Land	Winter Crops/ Feddan of Land	Summer Crops/ Feddan of Land
1	2.05	1.0	1.05
2	2.0	1.0	1.0
3	2.0	1.0	1.0
4	2.0	1.0	1.0
5	2.0	1.0	1.0
6	2.0	1.0	1.0
7	2.0	1.0	1.0
Average	2.0	1.0	1.0

Table 38
Summary of Crop and Livestock Production at
Abu-Raia Site - Farm Records (1978-1979)

Farm No.	Production and Disposition of Crops				Production and Disposition of Livestock						
	Fed to Livestock L.E.	Home Use L.E.	Sales L.E.	Production Total Value L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.	Non Purchased Feed L.E.	Purchased Feed L.E.	Purchased and Non Purchased Feed L.E.	Gain Over* All Feed Cost L.E.
1	376.0	248.0	1072.5	1696.5	231.7	37.4	269.1	376.0	3.0	379.0	-109.9
2	644.5	213.6	1038.9	1897.0	164.3	33.9	198.2	644.0	321.0	965.0	-766.8
3	444.5	356.5	1789.4	2590.4	188.6	50.0	238.6	444.5	65.0	509.5	-270.9
4	131.0	76.5	419.0	626.5	40.9	00.0	40.9	131.0	12.0	143.0	-102.10
5	523.5	173.8	1209.4	1898.7	87.0	36.0	123.0	523.5	00.0	523.5	-400.5
6	610.5	347.2	3171.5	4129.2	321.0	00.0	321.0	610.5	47.0	657.5	-336.5
7	308.0	197.0	584.5	1089.5	111.2	00.0	111.2	308.0	3.8	311.8	-200.6

* Gain over all feed costs is negative because we did not compute the animal power value which were used in farm operations in this table.

Table 39
Relative Contribution of Crops and Livestock to Total Production Values, Value of Crops Fed to Livestock and Value of Home Consumption

Farm No.	Crop Production Value L.E.	Livestock Production Value L.E.	Total Production Value L.E.	Crops Percent	Livestock Percent	Percent of Crops: Fed To Livestock	Percent of Crops: Consumed At Home	Percent of Livestock Products Consumed at Home
1	1696.5	269	1965	86	14	22	15	86
2	1897.0	198	2095	91	9	34	11	83
3	2590	239	2829	92	8	17	14	79
4	626	41	667	94	6	21	12	100
5	1899	123	2022	94	6	28	9	71
6	4129	321	4450	93	7	15	8	100
7	1089	111	1200	91	9	28	18	100
Total	13926.5	1302	15228	91	9			
Average						22	12	88

home consumption. On the average 88 percent of the value of livestock is consumed at home.

Livestock also contribute importantly to the farm through the amount of work they contribute (Table 40). By assigning values to the work contributions of livestock as in Table 41 and adding that value to the value of livestock for home use and sales the total value of livestock on farms increases markedly. In three of the seven cases (Farm 2, Table 42) the value of livestock exceed the costs of purchased and non-purchased feed. The net farm income for each farm is positive, however (Table 43).

In Table 44 the average value of crop and livestock production per feddan and the average net farm income per feddan and per person is shown. Net farm income (excluding land appreciation) averages 223 L.E. per feddan as compared to 325.9 L.E. and 164.5 L.E. per feddan at Bani-Magdoul and El Hammami, respectively. Table 39 also shows that average net farm income per person is much greater at Abu-Raia, however. Net farm income per person is 160 L.E. at Abu-Raia, 90.5 L.E. at Bani-Magdoul and 45.2 L.E. at El Hammami.

Table 45 shows the ratio of net farm income per feddan and per person divided by the average net farm income for all the study cases at Abu-Raia. Each individual study case is compared to the average of all study cases since this was the first year for keeping farm records and for analyzing its data.

Table 46 represents the relationships between working capital assets and the value of farm production.

Tables 47, 48 show the ratio of working capital assets per feddan and the ratio of crop production value divided by its expenses.

Table 40
Number of Livestock by Species, Work Done by Livestock and Ratio of Livestock Production (Not Including Work Value) ÷ L.S. Feed Expenses for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock				Working Hours Done by L.S.**						L.S. Production ÷ L.S. Feed Expenses		
		Cow	Buffalo	Calves	Donkey	Transportation*	Plowing	Leveling	Puddling	Turning Sakia	Total Hours	Purchased and Non Purchased Feed L.E.	Total Value of L.S. Production L.E.	L.S. Production ÷ L.S. Feed Expenses
1	6.38	-	2	1	2	700	56	19	11	738	824	379.00	269.10	0.71
2	6.79	1	1	4	2	700	235	40	11	726	1012	965.00	198.20	0.21
3	8.33	2	1	2	2	700	92	92	25	1038	1247	509.50	238.60	0.47
4	4.00	1	1	-	1	350	110	52	8	394	519	143.00	40.90	0.29
5	6.67	1	1	-	2	700	157	95	18	411	681	532.50	123.00	0.23
6	10.75	4	2	3	2	700	7	21	19	751	798	657.5	321.00	0.49
7	3.00	-	2	2	1	350	20	6	6	182	236	311.80	111.20	0.36

* Transportation and loading done by donkey. We assume that the minimum is 350 h. per year for one donkey.
** Working hours done by cows and buffalo only. These actual hours from record books.

Table 41
Value of Work Done by Livestock and Total Value of Livestock Production for Abu-Raia Study Cases (1978-1979)

Farm No.	Area Feddan	Farm Livestock				Value of Work Done by Livestock							Total Value of Livestock Production, Home Use and Sales L.E.	Gross Total Value of Livestock Production L.E.
						Transportation			Irrigation & Draft			Gross Total Value L.E.		
		Cow	Buffalo	Calves	Donkey	Hours	Value per Hour L.E.	Value L.E.	Hours	Value per Hour L.E.	Value L.E.			
1	6.38	-	2	1	2	700	0.150	105.00	824	0.300	247.20	352.20	269.10	621.30
2	6.79	1	1	4	2	700	0.150	105.00	1012	0.300	303.60	408.60	198.20	606.80
3	8.33	2	1	2	2	700	0.150	105.00	1247	0.300	374.10	479.10	238.60	717.70
4	4.00	1	1	-	1	350	0.150	52.50	519	0.300	155.70	208.20	40.90	249.10
5	6.67	1	1	-	2	700	0.150	105.00	681	0.300	204.30	309.30	123.00	432.30
6	10.75	4	2	3	2	700	0.150	105.00	798	0.300	239.40	344.40	321.00	665.40
7	3.00	-	2	2	1	350	0.150	52.50	236	0.300	70.80	123.30	111.20	234.50

Table 42
Ratio of Livestock Production (Including Work Value) ÷ L.S. Feed Expenses for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Area Feddan	Farm Livestock					Livestock Production Value			Purchased and non Purchased Feed L.E.	Gain Over All Feed Costs L.E.	Ratio of L.S. Production ÷ L.S. Feed Expenses
		Cow	Buffalo	Calves	Donkey	Poultry	Value of Work Done by L.S. L.E.	Value of L.S. Production Home Use & Sales L.E.	Total Value L.E.			
1	6.38	-	2	1	2	39	352.20	269.10	621.30	379.00	242.30	1.64
2	6.79	1	1	4	2	-	408.60	198.20	606.80	965.00	-358.20	0.63
3	8.33	2	1	2	2	8	479.10	238.60	717.70	509.50	208.20	1.41
4	4.00	1	1	-	1	-	208.20	40.90	249.10	143.00	106.10	1.74
5	6.67	1	1	-	2	-	309.30	123.00	432.30	532.50	-100.20	0.81
6	10.75	4	2	3	2	10	344.40	321.00	665.40	657.50	7.90	1.01
7	3.00	-	2	2	1	22	123.30	111.20	234.50	311.80	- 77.30	0.75

Table 43
Summary of Net Farm Income at Abu-Raia Site
Farm Records (1978-1979)

Farm No.	Summary of Income						Summary of Expenses						Net Farm Income
	Animal Products L.E.	Crop Products L.E.	Capital Sales L.E.	Inventory Changes if (+) L.E.	Off Farm Income L.E.	Total Gross Income L.E.	Crop Expenses L.E.	Non Crop Expenses L.E.	Capital Purchases L.E.	Inven-tory Changes if (-) L.E.	Non Purchase Livestock Feed L.E.	Total Gross Expense L.E.	
1	269.0	1697.0	260.0	2421.0	00.0	4647.0	444.8	34.3	170.0	00.0	376.0	1025.1	*3621.9 **1739.9
2	198.2	1897.0	1837.0	226.5	00.0	4158.7	398.8	355.6	1615.0	00.0	644.9	3013.9	1144.8 569.8
3	239.0	2590.0	505.0	5162.0	00.0	8496.0	814.0	190.0	590.0	00.0	445.0	2039.0	6457.0 1857.0
4	40.9	226.5	280.0	595.5	2.0	1544.9	161.6	24.5	253.0	00.0	131.0	570.1	974.8 294.8
5	123.0	1906.5	445.0	1601.0	00.0	4075.5	578.7	26.5	474.6	00.0	136.0	1215.8	2859.7 1599.7
6	322.0	4129.0	368.0	2383.0	175.0	7377.0	863.0	194.0	731.0	00.0	611.0	2399.0	4978.0 2373.0
7	111.0	1090.0	670.0	1654.0	00.0	3525.0	215.0	50.0	240.0	00.0	308.0	819.0	2706.0 1806.0

*N.F.I. including land appreciation

** N.F.I. without land appreciation

Table 44
Average Value Production per Feddan and Average Net Farm Income per Person at Abu-Raia Site
Farm Records (1978-1979)

Farm No.	Total Family Members	Area Feddan	Average Crop Prod/F.		Average Livestock Prod/F.		Average N.F.I./F.		Average N.F.I. Per Person L.E.
			Crop Production Value L.E.	Average Per Feddan L.E.	Livestock Production Value L.E.	Average Per Feddan L.E.	Net Farm* Income Value L.E.	Average Per Feddan L.E.	
1	9	6.38	1696.5	265.9	269.1	42.2	1739.9	254.7	193.3
2	6	6.79	1897.0	281.5	198.2	29.2	569.8	83.9	95.0
3	18	8.33	2590.4	311.0	238.6	28.6	1857.0	222.9	103.2
4	8	4.00	626.5	156.6	40.9	10.2	224.8	56.2	28.1
5	10	6.67	1898.7	284.7	123.0	18.4	1558.7	223.7	155.9
6	8	10.75	4129.2	384.0	321.0	29.9	1473.0	137.0	184.1
7	5	3.00	1089.5	363.2	111.2	37.9	1806.0	602.0	361.2

* N.F.I. without land appreciation

Table 45
Ratio of N.F.I. per Feddan and per Person ÷ Average N.F.I.
for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Family Members	Area Feddan	Ratio of N.F.I. per Feddan ÷ Average N.F.I.			Ratio of N.F.I. per Person ÷ Average N.F.I.		
			N.F.I. Per Feddan L.E.	Average N.F.I. Per Feddan L.E.	Ratio Col. 1 ÷ Col. 2	N.F.I. Per Person L.E.	Average N.F.I. Per Person L.E.	Ratio Col. 4 ÷ Col. 5
1	9	6.38	254.7	223	1.14	193.3	160	1.21
2	6	6.79	83.9	223	0.38	95.0	160	0.59
3	18	8.33	222.9	223	1.00	103.2	160	0.65
4	8	4.00	56.2	223	0.25	28.1	160	0.18
5	10	6.67	223.7	223	1.00	155.9	160	0.97
6	8	10.75	137.0	223	0.61	184.1	160	1.15
7	5	3.0	602.0	223	2.70	361.2	160	2.26

Table 46
Ratio of Value of Farm Production ÷ Working Capital Assets
for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Area Feddan	Total Assets Value at the Beginning of the Year					Total Value at the End of the Year L.E.	Average Value of Assets L.E.	Farm Production Value L.E.	Ratio of Farm Production ÷ Work Capital Assets
		Equipment Value L.E.	Livestock Value L.E.	Poultry Value L.E.	Grain and Forage Value L.E.	Total Value L.E.				
1	6.38	155.5	570	47	401.5	1174.5	1712.5	1443.5	1965.6	1.36
2	6.79	256	798	10	143.5	1198.5	2009	1603.7	2095.2	1.31
3	8.33	410	590	12	384	1396.0	1957.5	1676.7	2829.0	1.69
4	4.00	34	485	-	84.5	603.5	627.0	615.3	667.4	1.08
5	6.67	169.5	410	34.5	282	896.0	1237	1066.5	2029.7	1.90
6	10.75	455	1850	110	366	2781.0	2559	2670.0	4450.8	1.67
7	3.00	116	890	39	244	1289.0	1642.5	1465.8	1200.7	0.82

Table 47
Ratio of Working Capital Assets Value ÷ No. of Feddans
for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Area Feddan	Working Assets Value at the Beginning of the Year L.E.	Working Assets Value at the End of the Year L.E.	Average Value of Working Assets L.E.	Ratio of Working Assets ÷ Area/Feddan
1	6.38	1174.5	1712.5	1443.5	226.25
2	6.79	1198.5	2009.0	1603.7	236.19
3	8.33	1396.0	1957.5	1676.7	201.28
4	4.00	603.5	627.0	615.3	153.83
5	6.67	896.0	1237.0	1066.5	159.90
6	10.75	2781.0	2559.0	2670.0	248.37
7	3.00	1289.0	1642.5	1465.8	488.60

Table 48
Ratio of Value of Crop Production ÷ Crop Expenses
for the Study Cases at Abu-Raia Site (1978-1979)

Farm No.	Area Feddan	Value of Crop Production				Total Crop Expenses L.E.	Ratio of Value of Crop Production ÷ Crop Expenses	Remarks
		Livestock Feed L.E.	Home Use L.E.	Sales L.E.	Total Value L.E.			
1	6.38	376.0	248.0	1072.5	1696.5	444.8	3.81	
2	6.79	644.5	213.6	1038.9	1897.0	398.8	4.76	
3	8.33	444.5	356.5	1789.4	2590.4	814.0	3.18	
4	4.00	131.0	76.5	419.0	626.5	161.6	3.88	
5	6.67	523.5	173.8	1209.4	1906.7	578.7	3.29	
6	10.75	610.5	347.2	3171.5	4129.2	862.8	4.79	
7	3.00	308.0	197.0	584.5	1089.5	215.2	5.06	

We have presented summaries of the Farm Records collected at three EWUP sites. These records and their analyses are useful to understanding the operations of Egyptian farms. The records reveal the amount of resources available and their use. The relationship between crop and livestock enterprises are also shown along with the value of livestock for work on the farm.

A number of efficiency ratios were derived and between-farm comparisons were made. While few reliable between-farm differences can be observed with the analysis of data from only one year, these summaries will become increasingly useful with the addition of data from subsequent years. More importantly these records provide a benchmark for analyses of project accomplishments. As EWUP scientists discover and demonstrate useful improvements in the management of water and other important farm inputs, the farm records will reflect the effects of those changes on farm income.

Farm records also furnish the basis for some information necessary to evaluate the costs and returns of specific crop enterprises. Enterprise cost and return budgets completed to date are subsequently presented.

At the Bani-Magdoul site, comparative analyses reveal that rented farms may tend to have less livestock investment per feddan than is the case for owner-operated farms. Correspondingly, these farms consume a relatively greater portion of the value of livestock products in the home and tend to feed lower amounts of the value of crops produced to livestock.

On these rented farms the value of the work contribution relative to the total value of livestock is higher than for owner-operated farms. These differences are not translated into differences in net income per feddan or per person, however. Increased amounts of livestock on farms does not imply an increased percentage or amount of income from livestock products. Significant

changes in inventory do occur indicating that livestock may be a store of wealth which can be liquidated as needs arise.

The El Hammami site includes three partially rented farms. On the average, the El Hammami farmers included in the records project tend to be smaller than those in the Bani-Magdoul area. Likely, because of their size El Hammami farms tend to consume a higher percentage of the value of their livestock products at home. As before, an important part of the contribution of livestock comes from the value of the work contribution of livestock.

Among the farms at the Abu-Raia site in the Kafr El Sheikh Governate renting is less common. The farms also tend to be larger than the Mansouria Governate farms. A striking feature of the Abu-Raia farms is their similarity even across of relatively large size range. These farms tend to have fewer livestock per feddan and livestock make up a rather small percentage of total farm production value. Very few livestock products are sold; home consumption of livestock products is quite important. The work value of livestock are also important; in all seven cases the work value of livestock exceeds the value of livestock sales and home use of livestock products.

A number of efficiency ratios were calculated. The discussions above are based on some of these ratios. As the farm records project continues through time, these ratios will become more revealing. Likely, some of these ratios will be discarded and alternative ratios developed. It should be mentioned that for the overall EWUP concern about water management, ratios involving water use efficiency are needed. Such requires on-farm measurement of water and it may be some time before such measures can become available for a large number of farms.

These analyses provide a beginning. It is useful to observe the role of livestock on Egyptian farms. Since livestock are the power source for lifting water on most farms and EWUP is considering alternatives to these methods of lifting water the role of livestock is of special importance. Livestock also contribute products for home consumption and provide draft power for farming operations. As diesel and electric water lifting is applied or if gravity irrigation water delivery systems are established, the contributions of livestock are important indicators of anticipated adjustments.

If livestock contribute importantly to transportation, draft power, home consumption, and farm income, reduction of water lifting by animal power will likely lead to small adjustments in livestock numbers on farms. In such a case, land would not be freed from providing livestock feed to provide food for human consumption. Expansion of the land base to produce food for human consumption will require an integrated program to supplant the other contributions of livestock.

ANALYSIS OF INDIVIDUAL ENTERPRISES[11]

Much information relating to individual enterprises can be gleaned from the general set of farm accounts and records if only a small amount of detail is added. For individual enterprises records to be meaningful general expenses must be allocated to each of several enterprises as accurately as possible. Enterprise records should be kept on the accrual basis.

The important details to record relate to the variable cost elements. These are useful data for management purposes. In planning for short-time production

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[11] Farm Accounting and Business Analysis. Second edition. Sidney C. James and Everette Stoneberg. Chapter Eight. Iowa State University Press, 1979.

periods of one year or less, the variable costs are the key considerations relative to production volume and methods.

Both cash cost and opportunity cost should be considered in enterprise analysis. Supplementary enterprises and activities should never be charged for feeds, labor, or other resources that have no value (zero opportunity costs) except when utilized in the supplementary enterprise or activity.

Enterprise records can be helpful to the manager or decision maker in several ways. These records can pinpoint the level of profitability and the factors affecting this profitability during the enterprise accounting period, and if the records are kept over time, the level of performance from year to year can also aid the manager in making wise decisions relative to the future.

Crop production analysis would normally be on the basis of one production cycle or on a calendar year basis. Where there is some double-cropping, deviation from this may be feasible. In crop enterprise analysis it must be realized that land is a fixed cost to the operator. If necessary to include land costs, it may be on the basis of an interest charge on the land if it is owned, cash rent if it is rented or a share of the crop if under a crop-share lease. The decisions on crop production may be on an annual basis in some instances and on a length of rotation basis in others. Two conceptual problems arise when constructing enterprise costs and returns.[12/] One is an allocation problem; it is concerned with how general purpose equipment and general farm overhead items are allocated among alternative enterprises. The second is a distribution problem. It is concerned with how the total costs of producing a given enterprise are partitioned or divided between the various items used in the production process.

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[12]Miller, Thomas H. and Melvin Skold, "Uses and Users of Costs and Returns Data." A needs analysis proceedings. Great Plains Committee on Farm Management and Production Economics, GPC-10. Lincoln, Nebraska. 1980.

Economists differ as to how the allocation and distribution problems are handled.

In developing these enterprise budgets of Egyptian crops, these problems were faced in our discussions of the budgets, we shall attempt to be as explicit as possible in describing how the allocation and distribution issues were met.

COST ENTERPRISE DATA AT EGYPT

Cost enterprise data has been prepared for the following crops:

1.	Berseem	at Abu-Raia site
2.	Wheat	
3.	Cotton	
4.	Rice	
5.	Maize	
6.	Flax	at Mansouria site
7.	Squash	
8.	Artichoke	
9.	Tomatoes	
10.	Cabbage	
11.	Eggplant	

These enterprise cost studies are shown in the Appendix V. These cost studies are based upon data from five study cases; the budgets represent an average of the five cases. Cash and opportunity costs are computed for both variable and fixed costs.

In the future, data needed for enterprise costs will be obtained from farm records.

Table 49 summarizes the costs and returns for the enterprise budgets developed to date.

Table 49
Summary for 11 Crop Enterprise Cost Study
(each operation cost includes labor cost)

Crop	Period Month	Total Income L.E.	Variable Costs L.E.									Fixed Costs L.E.	Grand Total Costs L.E.	Return Above all Costs L.E.
			Plowing Smoothing	Organic Fertilizer	Seeds Transplant	Chemical Fertilizer	Irrigation	Hoeing Weeding Insecticide	Harvesting	Transportation	Total Variable Cost			
Wheat	7	100.00	3.75	8.70	6.6	8.3	10.20	1.20	17.55	3.60	59.90	36.00	95.90	4.10
Berseem	5	145.00	--	--	12.30	5	29.89	3	11.6	3.60	65.39	42.00	107.39	37.61
Cotton	7	190.00	13	12	4.02	14.2	34.20	23.22	25.20	4.5	130.34	54.00	184.00	5.66
Rice	6	168.50	6.5	13.70	11.6	12.2	91.06	2.4	14.2	8	157.66	48.00	205.66	-37.16
Maize	4	115.00	10.82	20.4	1.88	16.68	14.28	3.60	10.56	5.60	83.82	24.00	107.82	7.19
Flax	6	220.00	9	--	14	6.8	19.04	9	13.5	9	80.34	42.00	122.34	97.66
Squash	3	374.00	34.20	26	9.60	30.15	23.10	41.84	13.5	15	193.39	25.13	218.51	156.07
Artichoke	3	759.00	15	80.02	75	61.5	42	85.4	46.8	36	441.72	77.00	518.72	240.28
Tomatoes	4	455.00	15	--	22.5	42.5	48.96	89.5	48	--	266.46	136.00	402.46	52.54
Cabbage	6	720.00	90	33	31.5	37.5	32.64	46	36	30	336.64	32.00	368.64	351.36
Eggplant	6	706.00	67.5	27	25	59.6	65.28	43.5	49.5	45	382.38	96.00	478.38	227.62

The total income was calculated by knowing the yield and the price of each unit which the farmer received. Most prices are determined in a free market but for some crops like cotton and rice the government set the prices received. Farmers who raise cotton must deliver their production to governmental companies with fixed prices; for rice, the farmers have to deliver two-thirds of their rice yield to the Agricultural Cooperative and receive a fixed price; they keep one-third for their home consumption or sale on the free market.

For land plowing and smoothing the actual costs for operations such as hiring tractors are applied. If the farmer used his own equipment, the opportunity cost for his equipment, animals, and his family labors is used in the budget estimates.

Organic fertilizer costs are computed according to its opportunity cost; one donkey load of organic fertilizer costs 0.050 L.E.

The seeds and nursery plant costs are computed according to their market value, even if it was raised on the farm.

Chemical fertilizers, insecticides, and herbicides costs are computed according to the actual prices which the farmers pay for the item. For the rest of the variable costs like irrigation, hoeing, weeding, harvesting, thrashing, transportation, and storing, actual estimated costs of operations are computed when possible. Otherwise, opportunity costs are applied.

Fixed costs contain land rent and a management charge. Land rent is computed on the basis of the actual rent which the farmers pay to the land owner, even if it is not the legal fixed rent. (It is almost twice or more than the legal rent.)

The management charge was estimated by our economists. Their estimates take into consideration the period of each individual crop, the complexity of the agriculture operations, and the required expertise of the farmer.

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Governorate :.....

District :.....

Site :.....

Agric.coop.:.....

Pass number:.....

Address :.....

FARM RECORD

October 1st 19 to

30 September 19

Farmer's Name :.....

Size of farm :..... Feddan Kerat

No.	Owned F.	Owned K.		No.	Rented F.	Rented K.
...	...	...	X	...	...	...
...	...	...	X	...	...	...
...	...	...	X	...	...	...
...	...	...	X	...	...	...
			X			

Data gatherd by:.....

— EWUP ECONOMICS TEAM —

INVENTORY OF CAPITAL EQUIPMENTS

DESCRIPTION	BEGINING OF YEAR		END OF THE YEAR		REMARKS
	NO.	LE	NO.	LE	
TOTAL					

INVENTORY OF LIVE STOCK

DESCRIPTION	BEGINING OF YEAR		END OF THE YEAR		REMARKS
	NO.	LE	NO.	LE	

INVENTORY OF POULTRY

KIND	BEGINING OF YEAR		END OF THE YEAR		REMARKS
	NO.	LE	NO.	LE	
TOTAL					

INVENTORY OF GRAIN, FORAGE AND SUPPLIES

ITEM	KIND OF UNIT	BEGINING OF YEAR		END OF THE YEAR		REMARKS
		NO.	LE	NO	LE	
TOTAL						

INVENTORY OF LAND, CASH, LIABILITIES AND REAL ESTATE IMPROVEMENTS

DESCRIPTIONS	KIND OF UNIT	BEGINING OF YEAR		END OF THE YEAR		REMARKS
		NO.	LE	NO.	LE	
TOTAL						

LIVESTOCK PRODUCTION RECORD

DATE OR PERIOD	DESCRIPTION	KIND OF UNIT	HOME USE		OTHER		SALES		REMARKS
			NO.	LE	NO.	LE	NO.	LE	
TOTAL									

DESCRIPTION OF AGRICULTURAL OPERATIONS AND IT'S COSTS

NAME OF CROP PERIOD FROM: TO : AREA F. K. FIELD NO:

ITEMS	DATE	LABORS		EQUIPMENTS		ORGANIC		CHEMICAL		Fert.		Seeds		INSECTICIDES			OTHERS		REMARKS
		NO.	LE.	KIND	LE	QUAN.	LE	KIND		QUa.	LE	Quan.	LE	Kind	Quan.	LE		LE	
TOTAL																			LE

CROP PRODUCTION RECORD

KIND OF CROP	AREA		UNIT OF PR.	LE	YIELD PER FED.	TOT YIELD	LE	ANIMAL FED		HOME USE		SEEDS						REMARKS
	P.	K.						AMT.	LE	AMT.	LE	AMT.	LE	AMT.	LE	AMT.	LE	
TOTAL																		

ANIMAL FEED RECORD

DATE OR PERIOD	KIND OF FOOD	KIND OF UNIT	NO.	COST IF PURCHASED LE	REMARKS
TOTAL					

WORK DONE BY ANIMALS

DATE OR PERIOD	KIND OF ANIMAL	KIND OF WORK	NO. OF HOURS	REMARKS

DESCRIPTION OF OTHER EXPENSES

DATE	ITEM	LE	REMARKS
TOTAL			

DESCRIPTION OF OTHER INCOME

DATE	ITEM	LE	REMARKS
TOTAL			

FARM RECORD SUMMARY

EHUP ECONOMICS TEAM

for the agricultural year from oct 1, 1978 to oct. 31, 1979

Farmer's Name: Sarrah Mustafa abdu Farm Size: (feddan)* 8.3 Location: abu Rain – Kafr Elsheikh

Inventory Change

ITEM	Beginning of the year LE	end of the year LE	+ or −	Changing Value LE	REMARKS
Inventory of Equipments	410	410			
Inventory of Livestock	590	1323	+	733	
Inventory of Poultry	12	21	+	9	
Inventory of Grain and Forage	284	2075	−	1805	
Inventory of Land and Real Estate	14800	19200	+	4600	
TOTAL	16196	21157.5	+	5161.5	

Animal and Crop Production

ANIMAL PRODUCTS				CROP PRODUCTS			
Animal feed LE	Home Use LE	Sales LE	TOTAL	Animal feed LE	Home Use LE	Sales LE	TOTAL
	1386	501	2386	4445	3565	17094	25904
TOTAL			2386	TOTAL			25904

* 1 feddan = 4200.8335 sq. meter = 1.0381 acre = 0.4201 hectar

Crop Expenses

CROP	Field No.	Area Fed.	Labors LE	Equipments LE	Org. Fert. LE	Chem. Fert LE	Seeds LE	Insecticides LE	OTHER LE	TOTAL LE
Bersoom	2A	1		3		17				
Wheat	1A	1.5	927	168						47
Bersoom	1B	0.9				95				50
Flax	1C	1.2	29	35		48				46
Broad Beans	2B	0.8	85	41		11			23	48
Bersoom	2C+D	1.3	55							75
Flax	3A	0.3	57	1		44				55
Wheat	3B	1.9	107	128		85			18	116
Watermellon	3D	0.3	27			36	07			32
Maize	3B	0.7	123			166	166			50
Rice	1B+C	9.3	724	161	78	902			112	285
Maize Forage	3D	0.3	16			25				12
Bersoom	3C	0.8	6	12	48					4
Rice	1B+C	30	1015	405		317	18		14	121
Cotton	2B+C	20	195	12		158	42	40	5	2057
										27
TOTAL LE		XXX	4655	1099	86	1301	245	400	354	8140

Non-Crop Expense

KIND OF EXPENSE	LE	KIND OF EXPENSE	LE
Purchased animal feed	65	Cleaning Grain	11
Land rent		others	46
Taxes	45		
Corp. commission	23		

TOTAL NON-CROP EXPENSES = LE 190.00

Summary of Income

Animal Products	239
Crop Products	2590
Capital	505
Inventory change if +	5162
Other	

Summary of Expenses

Crop Expenses	814
Non-Crop Expenses	192
Capital Purchases	590
Inventory change if −	
Non-Purchased Animal Feed	445

NET FARM INCOME
with Land Appreciation = LE 6457
without Land Appreciation = LE 1857

CROP ENTERPRISE COST STUDY *

FLAX AT BANI-MAGDOUL AREA(1)

Prepared by: 4 STUDENTS&FAROUK ABDELAL — EGYPT WATER USE & MANAGEMENT PROJECT
Identifier Code: TP-1,Trk-1,f-9
Date Prepared: AUGUST 20 , 1979

Item	Unit	Number of Units	Price or Value per unit L.E.	Total Income or Costs L.E.
Income				
Flax seeds	Kg.	600.0	0.250	150.00
Flax stalks	Ton	2.0	35.000	70.00
Total Income				220.00
Variable Costs				
Plowing	Tractor hour	4.0	1.500	6.00
Land smoothing	Tractor hour	2.0	1.500	3.00
Seeds	Kg.	50.0	0.250	12.50
Labor for seeds planting	Man hour	6.0	0.250	1.50
Weeding (2 times)	Man hour	36.0	0.250	9.00
CHEMICAL FERTILIZER		0.0	0.000	0.00
Ammonium nitrate (33-0-0)	Kg.	100.0	0.053	5.30
Labor to spread chem. fert.	Man hour	6.0	0.250	1.50
IRRIGATION (2)		0.0	0.000	0.00
Sakia rent	Sakia hour	28.0	0.080	2.24
Cow or Buffalo rent	C. or B.hour	28.0	0.300	8.40
Boy or Girl to observe sakia	B. or G.hour	28.0	0.050	1.40
Labor to spread water	Man hour	28.0	0.250	7.00
HARVESTING (3)		0.0	0.000	0.00
Labor for harvesting	Man hour	36.0	0.250	9.00
Labor to take stalks off	Man hour	18.0	0.250	4.50
Transport stalks by camel	Camel load	12.0	0.500	6.00
Labor to load the camels	Man hour	12.0	0.250	3.00
Total Variable Costs				80.34
Return Above Variable Costs				139.66
Fixed Costs				
Land rent	Month	7.0	5.000	35.00
Management charge	Month	7.0	1.000	7.00
Total Fixed Costs				42.00
Grand Total Costs				122.34
Return Above All Costs				97.66

FOOTNOTES:

* This study for an area of one feddan.
(1) These data was collected from 4 study cases at BANI-MAGDOUL site by ADEL ABDEL MONEM,GAMAL BRKAT,MAHMOUD ABDELMONEM and ASHRAF KENNAWY students from FACULTY OF AGRICULTURE-AIN SHAMS UNIVERSITY,ECON.DEPART.
(2) FLAX needs one 8-hour irrigation before planting and five 4-hour irrigation after planting, 1F. needs about cu. meters.
(3) FLAX is an early-maturing winter crop which is usually planted in NOVEMBER and harvested in APRIL and early in MAY , flax is grown as a dual-pupose crop for both FIBER and SEEDS .

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	0	0	0	0	0	0	0
November	18	0	8	0	0	0	0
December	14	0	8	0	0	0	0
January	12	0	4	0	0	0	0
February	12	0	4	0	0	0	0
March	4	0	4	0	0	0	0
April	0	0	0	0	0	0	0
May	62	0	0	0	0	0	0
June	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0
Total	142	0	28	Total Water Applied=		0 cu meters	

CROP ENTERPRISE COST STUDY *

TOMATOES AT BANI MAGDOUL AREA (1)

Prepared by: LOTFI NASR&FAROUK ABDELAL — EGYPT WATER USE & MANAGEMENT PROJECT
Identifer Code: TP-1,Trk-0,f-3
Date Prepared: December 1978

Item	Unit	Number of Units	Price or Value per unit L.E.	Total Income or Costs L.E.
Income				
Tomatoes fruits	KG.	13000.0	0.0350	455.00
Total Income				455.00
Variable Costs				
Plow by tractor	Tractor hour	4.0	1.5000	6.00
Labor to balance ferrows	Man hour	36.0	0.2500	9.00
Nursary plants	Thousand	12.0	1.5000	18.00
Labor for transplanting	Man hour	18.0	0.2500	4.50
Chemical fertilizer		0.0	0.0000	0.00
Super phosphate (0-15.5-0)	KG.	500.0	0.0270	13.50
Ammonium nitrate (33-0-0)	KG.	400.0	0.0500	20.00
Labor to spread chem. fert.	Girl hour	90.0	0.1000	9.00
Hoeing,weeding (5 times)	Man hour	132.0	0.2500	33.00
Irrigation: (2)		0.0	0.0000	0.00
Cow or buffle rent	C.or B. hour	72.0	0.3300	23.76
Sakia rent	Sakia hour	72.0	0.0500	3.60
Boy to observe the sakia	Boy hour	72.0	0.0500	3.60
Labor to spread water	Man hour	72.0	0.2500	18.00
Insecticides:		0.0	0.0000	0.00
Flaxon & Malathion	Liter	10.0	1.4500	14.50
Sprayer rennt	Sprayer hour	60.0	0.0500	3.00
Labor to spray	Man hour	60.0	0.2500	15.00
Fungicide	Can	3.0	5.0000	15.00
Labor to spread fungicide	Man hour	36.0	0.2500	9.00
Harvesting (3)		0.0	0.0000	0.00
Labor for harvesting	Man hour	192.0	0.2500	48.00
Total Variable Costs				266.46
Return Above Variable Costs				188.54
Fixed Costs				
Land rent	Month	8.0	15.0000	120.00
Mangement charge	Month	8.0	2.0000	16.00
Total Fixed Costs				136.00
Grand Total Costs				402.46
Return Above All Costs				52.54

FOOTNOTES:

* This study for an area of one feddan.
(1) Tomato is grown in almost equal areas during the three cropping season but the yields are higer in the summer and nili crops than wintercrop
(2) Tomatoes need from 7 to 8 irrigations one before planting for 8 hours the others for 6 hour irrigation each 12 dayes .
1est irrigation befor planting — 8 hours
2end irrigation after 3 dayes — 4 hours
then one irrigation each 12 dayes, (5x12 hours) — 60 hours
Total time for irrigation — 72 h
(3) one labor (man,woman,boy or girl) can harvest 2 loads [illegible] KG.)

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	72	0	12	240	240	0	0
November	90	0	18	240	240	0	0
December	66	0	12	240	240	0	0
January	42	0	6	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0
June	60	0	12	0	0	0	0
July	60	0	36	320	160	0	0
August	66	0	36	240	240	0	0
September	90	0	30	240	240	0	0
Total	546	0	162	Total Water Applied=		2880 cu meters	

FOOTNOTES:

Footnotes for water requirements and labor
- Water requirements based on Engineering office paper dated on 7.15.1978
- 1 manday = 6 hours

Best Available Document

CROP ENTERPRISE COST STUDY *

CABBAGE AT EL MAMMAMI AREA (1)

Prepared by: ELSHINNAWY&FAROUK ABDELAL — EGYPT WATER USE & MANAGEMENT PROJECT
Identifer Code: TP-1,Trk-0,f-5
Date Prepared: March 7, 1979

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Cabbage	One cabbage	12000.0	0.0600	720.00
Total Income				720.00
Variable Costs				
Org. Fert. transportation	Camel load	100.0	0.3000	30.00
Labor to spread org. fert.	Man hour	12.0	0.2500	3.00
Labor for digging	Mann hour	240.0	0.2500	60.00
Labor for land leveling	Man hour	60.0	0.2500	15.00
Labor for making ferrows	Man hour	60.0	0.2500	15.00
Nursary plants	Thousand	18.0	1.2500	22.50
Labor for transplanting	Man hour	36.0	0.2500	9.00
Labor for hoeing (2 times)	Man hour	66.0	0.2500	16.50
Labor for weeding	Man hour	30.0	0.2500	7.50
CHEMICAL FERTILIZER		0.0	0.0000	0.00
Ammonium nitrate (33-0-0)	KG.	600.0	0.0500	30.00
Labor to spread chem. fert.	Man hour	30.0	0.2500	7.50
IRRIGATION (2)		0.0	0.0000	0.00
Cow or Buffle rent	C.or B. hour	48.0	0.3300	15.84
Sakia rent	Sakia hour	48.0	0.0500	2.40
Boy or Girl to observe sakia	B. or G.hour	48.0	0.0500	2.40
Labor to spread water	Man hour	48.0	0.2500	12.00
INSETISIDES		0.0	0.0000	0.00
Dimethweat	Liter	4.0	4.2500	17.00
Spray motor rent	Motor hour	5.0	0.4000	2.00
Labor to spray	Man hour	12.0	0.2500	3.00
HARVESTING		0.0	0.0000	0.00
Labor for harvesting	Man hour	72.0	0.2500	18.00
Labor for taking plants off	Man hor	72.0	0.2500	18.00
Transportation to the Market	Wagon load	10.0	3.0000	30.00
Total Variable Costs				336.64
Return Above Variable Costs				383.36
Fixed Costs				
Land rent	Month	4.0	6.0000	24.00
Management charge	Month	4.0	2.0000	8.00
Total Fixed Costs				32.00
Grand Total Costs				368.64
Return Above All Costs				351.36

FOOTNOTES:

* This study for an area of one feddan.
(1) The best period for transplanting cabbage is during JULY and AUGUST.
(2) Cabbage needs about 8 irrigations ,1F. needs about 2800 cu meters
1est irrigation before transplanting — 8 hours
2end irrigation after 3 dayes of transplantting — 4 hours
Then one six hour irrigation each 15 dayes (6x6) — 36 hours
Total time for irrigation — 48 hours

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	78	0	12	360	360	0	0
November	90	0	12	360	360	0	0
December	120	0	12	280	0	0	0
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	372	0	4	480	0	0	0
September	78	0	8	240	360	0	0
Total	738	0	48	Total Water Applied=		2800 cu meters	

FOOTNOTES:

- Water requrements based on Enginering office paper dated on 7.15.1978.
- One working day = 6 hours.

Best Available Document

CROP ENTERPRISE COST STUDY *
EGGPLANT AT EL HAMMAMI AREA(1)

Prepared by: ELSHINNAWI&FAROUK ABDELAL — EGYPT WATER USE & MANAGEMENT PROJECT
Identifer Code: UP-1,Irk-0,f-1
Date Prepared: February 26,1979

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Eggplant	KG.	10000.0	0.0700	700.00
Straw	Camel load	3.0	2.0000	6.00
Total Income				706.00
Variable Costs				
Transportation for org. fert.	Donkey load	300.0	0.0800	24.00
Labor to spread org. fert.	Man hour	12.0	0.2500	3.00
Labor for land digging	Man hour	240.0	0.2500	60.00
Labor to make ferrows	Man hour	30.0	0.2500	7.50
Nursery plants	Thousand	16.0	1.0000	16.00
Labor for transplanting	Man hour	36.0	0.2500	9.00
Labor for hoeing (3 times)	Man hour	90.0	0.2500	22.50
Labor for weeding	Man hour	18.0	0.2500	4.50
Chemical fertilizer		0.0	0.0000	0.00
Ammonium nitrate (33-0-0)	KG.	1000.0	0.0500	50.00
Labor to spread chem. fert.	Girl hour	96.0	0.1000	9.60
Irrigation (2)		0.0	0.0000	0.00
Cow or buffle rent	C.or B. hour	96.0	0.3300	31.68
Sakia rent	Sakia hour	96.0	0.0500	4.80
Boy or Girl to observe sakia	Boyor G.hour	96.0	0.0500	4.80
Labor to spread water	Man hour	96.0	0.2500	24.00
Insectisides		0.0	0.0000	0.00
Dimethweat	Liter	2.0	2.0000	4.00
Ssulpher	KG.	100.0	0.0750	7.50
Sprayer motor rent	Motor hour	5.0	0.4000	2.00
Labor to spray	Man hour	12.0	0.2500	3.00
Harvesting (3)		0.0	0.0000	0.00
Labor for harvesting	Man hour	180.0	0.2500	45.00
Labor for taking plants off	Man hour	18.0	0.2500	4.50
Transportation to the market	Wagon load	3.0	15.0000	45.00
		0.0	0.0000	0.00
Total Variable Costs				382.38
Return Above Variable Costs				323.62
Fixed Costs				
Land rent	Month	12.0	6.0000	72.00
Management charge	Month	12.0	2.0000	24.00
Total Fixed Costs				96.00
Grand Total Costs				478.38
Return Above All Costs				227.62

FOOTNOTES:

* This study for an area of one feddan.
(1) Eggplant is grown in almost equal areas during the summ r and winter cropping season, previous crop may be maize forage or b rseem
(2) Eggplant needs from 16 to 18 irrigations
1est irrigation before transplanting — 8 hours
2end irrigation after 3 dayes of transplanting — 4 hours
then 14 six hour irrigation except flowering time — 84 hours
Total time for irrigation — 96 hours
(3) Harvesting begins after 3 monthes of planting the farmer can Harvest 14 times during the rest of the season .

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	330	0	12	200	100	0	0
November	54	0	12	150	0	0	0
December	54	0	12	150	0	0	0
January	30	0	6	0	0	0	0
February	54	0	24	150	150	0	0
March	36	0	24	150	150	0	0
April	36	0	24	150	150	0	0
May	36	0	24	150	0	0	0
June	36	0	18	150	150	0	0
July	24	0	18	150	150	0	0
August	24	0	18	150	0	0	0
September	18	0	0	0	0	0	0
Total	732	0	192	Total Water Applied=		2400 cu meters	

FOOTNOTES:

- Water requirements based on Enginering office paper dated on 7.15.1970
- One working day = 6 hours

CROP ENTERPRISE COST STUDY *

ARTICHOKE AT BANI-MAGDUEL

Prepared by: MOHAMED LOTFI NASR
Identifier Code: TP-1,Trk-a,F13
Date Prepared: DECEMBER 15 1979

EGYPT WATER USE & MANAGEMENT PROJECT

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Ears	Ear	25300.0	0.030	759.00
Total Income				759.00
Variable Costs				
Plowing By Tractor	Hour	4.0	1.500	6.00
Labor To Smooth Ferrows	Man Hour	36.0	0.250	9.00
SEED		0.0	0.000	0.00
Small Plant From Nursery	Plant	6000.0	0.010	60.00
Labor For Transplanting	Man Hour	60.0	0.250	15.00
ORG Fertilizer	Donkey Load	300.0	0.150	45.00
Transportation Org Fert	Cart Load	5.0	3.000	15.00
Labor To Spread Org Fert	Man Hour	48.0	0.250	12.00
Labor To Spread Org Fert	Girl Hour	48.0	0.167	8.02
Chemical Fertilizer 31-0-0	KG	750.0	0.070	52.50
Labor To Spread Chme Fert	Man Hour	36.0	0.250	9.00
Weeding And Hoeing	Man Hour	204.0	0.250	51.00
Irrigation		0.0	0.000	0.00
Sakia Rent	Sakia Hour	60.0	0.040	3.40
Cow Or Donkey Rent	C-D Hour	60.0	0.330	19.80
Boy Or Girl To Drive C Or D	B-G Hour	60.0	0.080	4.80
Labor To Distribute Water	Man Hour	60.0	0.250	15.00
Insecticide Malthyon-Flaxon	Liter	6.0	3.150	18.90
Labor To Spread Insecticide	Man Hour	50.0	0.250	12.50
Sprayer To Spread Isecticide	Sprayer Hour	50.0	0.060	3.00
Harvisting		0.0	0.000	0.00
Labor To Picking Ears	Man Hour	144.0	0.250	36.00
Labor T Picking Ears	B-G Hour	144.0	0.075	10.80
Transportation	Cart Load	12.0	3.000	36.00
Total Variable Costs				441.72
Return Above Variable Costs				317.28
Fixed Costs				
Land Rent	Month	10.0	6.200	62.00
Management Charge	Month	10.0	1.500	15.00
Total Fixed Costs				77.00
Grand Total Costs				518.72
Return Above All Costs				240.28

FOOTNOTES.

* This study for an area of one feddan.
Planting Date Start Agust 15 To September 15
Harvisting Start At The End Of September
Organig Fert Added After 3-4 Months Of The Planting Date
6 Times For Insecticide
Previous Crop May Be Maize Or Maize Fourge
Usually Farmer To Plant Artichoke On There Own Land
Artichoke Harvisting Is About 10-12 Times With 2000-2500 Ears Per day.

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	74	0	12	0	0	0	0
November	100	0	36	0	0	0	0
December	108	0	48	0	0	0	0
January	70	0	38	0	0	0	0
February	68	0	41	0	0	0	0
March	40	0	30	0	0	0	0
April	32	0	23	0	0	0	0
May	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	110	0	12	0	0	0	0
September	46	0	12	0	0	0	0
Total	638	0	252	Total Water Applied=		0 cu meters	

FOOTNOTES:

Irrigation Before Planting 8 Hours
Next Irrigation After Planting 4 Hours
8 IRRIGATIONS During Growing Time 8 Hours For Each Irrigation
15 Days Between Each Two Irrigations In Summer And 8 In Winter

CROP ENTERPRISE COST STUDY *
SQUASH AT EL-HAMMAMY

Prepared : MOHAMED LOFTY NASR
Identifier Code: tp-1,trk-0,f15
Date Prepared: JANUARY 10 1980

EGYPT WATER USE & MANAGEMENT PROJECT

Item	Unit	Number of Units	Price or Value per unit L.E.	Total Income or Costs L.E.
Income				
Fruit	KG	4162.0	0.090	394.58
Total Income				374.58
Variable Costs				
Plowing And Ferrowing	Hour	9.0	3.000	27.00
Labor to smooth ferrows	Man Hour	24.0	0.300	7.20
SEED	KG	2.0	3.000	6.00
Labor to plant	Man hour	12.0	0.300	3.60
ORG Fertilizer	Donkey load	320.0	0.070	22.40
Labor to spread org fert	Man hour	12.0	0.300	3.60
Chemical fertilizer 31-0-0	KG	325.0	0.090	29.25
Labor to spread chem fert	Man hour	3.0	0.300	0.90
Weeding And Hoeing	Man hour	48.0	0.300	14.40
Irrigation		0.0	0.000	0.00
Sakia Rent	Sakia hour	30.0	0.050	1.50
Donkey to turn sakia	D-hour	30.0	0.350	10.50
Boy to drive donkey	B-hour	30.0	0.070	2.10
Labor to distribute water	Man hour	30.0	0.300	9.00
Insecticide		0.0	0.000	0.00
Lannate	Gram	460.0	0.019	8.74
Bayfolan	CM	230.0	0.009	1.99
Nemroud	CM	360.0	0.003	1.08
Labor to spread insecticide	Man hour	18.0	0.300	5.40
Sprayer to spread insecticide	sprayer hour	18.0	0.400	7.20
Feul for sprayer	Liter	33.0	0.090	2.98
Fungicid	KG	15.0	0.070	1.05
Harvisting		0.0	0.000	0.00
Labor to picking fruit	Man hour	45.0	0.300	13.50
Transportation	Cart Load	6.0	2.500	15.00
Total Variable Costs				193.39
Return Above Variable Costs				181.19
Fixed Costs				
Land rent	Month	2.5	8.300	20.75
Managament Charge	Month	2.5	1.750	4.38
Total Fixed Costs				25.13
Grand Total Costs				218.51
Return Above All Costs				156.07

FOOTNOTES:

* This study for an area of one feddan
Planting date start September first to 15
Harvisting start after 40 days of planting and continue 40 days more
Harvisting each 2 days and the averge for the frist four harv-80 kg
Plowing costs is high because of deep plowing
Organic fertilizer spreaded frist followed by an irrigation
Previous crop may be maize or sunflower
Ferrows width was 95 cm

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	69	0	18	0	0	0	0
November	3	0	0	0	0	0	0
December	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	1[illegible]	0	0	0	0	0	0
September	108	0	12	0	0	0	0
Total	192	0	30	Total Water Applied=		0 cu meters	

FOOTNOTES:

Total Number hour of irrigation was 30 hours
The average number of hour per irrigation 2 hours

CROP ENTERPRISE COST STUDY *
WHEAT AT ABU-RAIA AERA (1)

Prepared by: 4STUDENTS&FAROUK ABDELAL
Identifier Code: Tp-1,Trk-1,f-7
Date Prepared: AUGUST 20, 1979

EGYPT WATER USE & MANAGEMENT PROJECT

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Wheat grains	Ardab	8.0	8.000	64.00
Wheat straw	Camel load	6.0	6.000	36.00
Total Income				100.00
Variable Costs				
Org. Fert. transportation	Donkey load	150.0	0.050	7.50
Labor to spread org. fert.	Man hour	6.0	0.200	1.20
Plowing	Tractor hour	2.0	1.150	2.30
Land smoothing	Tractor hour	1.0	1.250	1.25
Seeds	kaila	6.0	1.000	6.00
Labor to spread seeds	Man hour	3.0	0.200	0.60
Weeding	Boy hour	12.0	0.100	1.20
CHEMICAL FERTILIZER		0.0	0.000	0.00
Ammonium nitrate (31.5-0-0)	Kg.	150.0	0.050	7.50
Labor to spread chem.fert.	Man hour	4.0	0.200	0.80
IRRIGATION (2)		0.0	0.000	0.00
Sakia rent	Sakia hour	15.0	0.080	1.20
Cow or Buffle rent	C.or B. hour	15.0	0.300	4.50
Girl or Boy to observe sakia	B.or G. hour	15.0	0.100	1.50
Labor to spread water	Man hour	15.0	0.200	3.00
HARVESTING		0.0	0.000	0.00
Labor for harvesting	Man hour	36.0	0.200	7.20
Thrashing	Machine hour	6.0	1.150	6.90
Winnowing	Machine hour	3.0	1.150	3.45
TRANSPORTATION		0.0	0.000	0.00
Labor for loading	Man hour	3.0	0.200	0.60
Transport grains by camel	Camel load	3.0	1.000	3.00
Total Variable Costs				59.90
Return Above Variable Costs				40.10
Fixed Costs				
Land rent	Month	6.0	5.000	30.00
Management charge	Month	6.0	1.000	6.00
Total Fixed Costs				36.00
Grand Total Costs				95.90
Return Above All Costs				4.10

FOOTNOTES:

* This study for an area of one feddan.
(1) These data was collected from 4 study cases at ABU-RAIA site byIBRAHIM ELSHENNAWY, MOHAMED ELGAZZAR, ABDELHALIM ELSHERBINY and MOHAMED SALAMA Students from FACULTY OF AGRICULTURE AT KAFR ELSHEIKH-ECONOMICS DEPARTMENT
(2) Wheat needs about 5 irrigations , 1F. needs about 1600 cu. meters .

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	0	0	0	0	0	0	0
November	12	0	3	180	0	0	0
December	3	0	3	400	0	0	0
January	0	0	13	0	0	0	0
February	7	0	3	345	0	0	0
March	3	0	3	348	0	0	0
April	3	0	3	327	0	0	0
May	39	0	0	0	0	0	0
June	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0
Total	67	0	27	Total Water Applied=		1600 cu meters	

FOOTNOTES:

Water requirements based on our project research stations' data .
* Working day = 6 hours .

CROP ENTERPRISE COST STUDY *

BERSEEM AT ABU RAIA AREA (1)

Prepared by: GENE YUSEF, GAMAL AYAD — EGYPT WATER USE & MANAGEMENT PROJECT
Identifier Code: IP-1,Trk-1,F-3
Date prepared: September 15,1978

Item	Unit	Number of Units	Price or Value per unit L.E.	Total Income or Costs L.E.
Income				
3 cuts sold standing X24 kerats.	Kerat cut(2)	72.0	1.500	108.00
1 cut for seed.		0.0	0.000	0.00
Straw.	Kaila (3)	8.0	4.000	32.00
	Load	4.0	1.250	5.00
Total Income				145.00
Variable Costs				
Seeds.	Kaila	1.5	8.000	12.00
Labor to spread seeds.	Man hour	2.0	0.150	0.30
Chemical fertilizers:		0.0	0.000	0.00
Super phosphate (0-15.5-0).	Kg	100.0	0.022	2.20
Ammonium nitrate (31-0-0).	"	50.0	0.050	2.50
Labor to spread chem. fert.	Man hour	2.0	0.150	0.30
Cleaning drain (LE 0.01/M).	" "	12.0	0.250	3.00
Harvesting 4th cut (4).	" "	18.0	0.200	3.60
Transporting by camel.	Camel load	6.0	0.500	3.00
Labor to load camel.	Man hour	3.0	0.200	0.60
Threshing by tractor.	Tractor hour	2.0	1.750	3.50
Labor for threshing.	Man hour	6.0	0.250	1.50
Winnowing.	" "	12.0	0.250	3.00
Irrigation: (5)		0.0	0.000	0.00
Cow or buffalo rent.	C.or B. hour	49.0	0.330	16.17
Sakia rent.	Sakia hour	49.0	0.080	3.92
Labor to spread water.	Man hour	49.0	0.200	9.80
Total Variable Costs				65.39
Return Above Variable Costs				79.61
Fixed Costs				
Land rent.	Month	7.0	5.000	35.00
Management charge.	"	7.0	1.000	7.00
Total Fixed Costs				42.00
Grand Total Costs				107.39
Return Above All Costs				37.61

FOOTNOTES:

* This study for an area of one feddan.
(1) Planting date is October 20 to November 15.The immediate preceeding crop may be rice,maize.Cotton is not an alternative following crop since it must be planted by march 10.
(2) On the average 1 kerat cut of green berseem weighs 320 Kg.
(3) The price of seeds at planting time is higher than price at harvest time.
(4) The final harvest is before May 20.
(5) Irrigation at planting time — 4 hours
Second irrigation after 1 month — 5 hours
Third irrigation after 25 days — 5 hours
Fourth irrigation after winter closure — 7 hours
Then 1 irrigation each 11 days (7X4 hrs.) — 28 hours
TOTAL time for irrigation — 49 hours

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	0	0	0	0	0	0	0
November	6	0	0	181	0	0	0
December	6	0	0	227	0	0	0
January	6	0	0	317	0	0	0
February	9	0	0	181	181	181	0
March	18	0	0	181	181	181	0
April	12	0	0	181	0	0	0
May	9	0	0	0	0	0	0
June	38	0	0	0	0	0	0
July	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0
Total	104	0	0	Total Water Applied=		1992 cu meters	

FOOTNOTES:

--Water distribution estimation based on ELTOBGY'S book.
--One working day= 6 hours.

CROP ENTERPRISE COST STUDY *
COTTON AT ABU RAIA AREA (1)

Prepared by: GENE , YUSEF A GAMAL AYAD — EGYPT WATER USE & MANAGEMENT PROJECT
Identifier Code: IP-1,irk-1,F-1
Date Prepared: August 20,1978

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Unginned cotton	Kentar (2)	5.0	35.000	175.00
Stalks.	Camel load	5.0	3.000	15.00
Total Income				190.00
Variable Costs				
Organic fertilizer.	Cubic meter.	20.0	0.600	12.00
Plow with tractor,(3 times).	Feddan	3.0	2.000	6.00
Smooth with cows and drang.	Feddan	1.0	2.000	2.00
Furrow " " " plow.	Feddan	1.0	2.000	2.00
Clean ditch.	Man hour	10.0	0.200	2.00
Smooth with cows and drang.	Feddan	1.0	1.000	1.00
Seeds.	Kaila (3)	7.0	0.300	2.10
Plant seeds by hand.	Woman hour	24.0	0.080	1.92
Chemical fertilizers:		0.0	0.000	0.00
Super phosphate (0-15.5-0).	Kg.	100.0	0.022	2.20
Ammonium Nitrate (33.3-0-0).	Kg.	200.0	0.050	10.00
Spread chem. fert.by hand.	Man hour	10.0	0.200	2.00
Irrigation:		0.0	0.000	0.00
first irrigation.	Man hour	6.0	0.200	1.20
Second irrigation.	" "	4.0	0.200	0.80
Third irrigation.	" "	4.0	0.200	0.80
Fourth irrigation.	" "	4.0	0.200	0.80
Fifth irrigation	" "	4.0	0.200	0.80
Sixth irrigation.	" "	4.0	0.200	0.80
Seventh irrigation.	" "	4.0	0.200	0.80
Eighth irrigation.	" "	4.0	0.200	0.80
Nineth irrigation.	" "	4.0	0.200	0.80
Pumping water with d.pump.	Pump hour	38.0	0.700	26.60
Thin by hand.	Boy hour	18.0	0.050	0.90
Hoeing (two times).	Man hour	14.0	0.200	2.80
Weeding (three times).	Boy hour	36.0	0.070	2.52
Pick insect eggs as needed.	Feddan	1.0	9.000	9.00
Chemical control of insects.	"	1.0	8.000	8.00
The first cotton pick. (4)	Woman hour	120.0	0.080	9.60
The second cotton pick. (5)	" "	120.0	0.080	9.60
Transport unginned cotton.	Feddan	1.0	1.000	1.00
Cut stalks.	Man hour	30.0	0.200	6.00
Transport stalks.	Camel load	5.0	0.500	2.50
Labor to load stalks.	Man hour	5.0	0.200	1.00
Total Variable Costs				130.34
Return Above Variable Costs				59.66
Fixed Costs				
Land rent. (6)	Month	9.0	5.000	45.00
Management charge.	"	9.0	1.000	9.00
Total Fixed Costs				54.00
Grand Total Costs				184.34
Return Above All Costs				5.66

FOOTNOTES:

* This study for an area of one feddan.
(1) Cotton planted during the period Feb. 20 to March 10, the previous crop is berseem or ,very rarely, a fallow.Most farmers grow berseem as a winter crop.The previous summer crop is usualy rice or Maize.
(2) 1 kentar of unginned cotton = 157.5 Kg.
(3) 1 kaila of cotton seeds = 10 Kg.
(4) The first pick of cotton = 3.5 kentar.
(5) the second pick of cotton = 1.5 kentar.
(6) Cotton requires only 8 months growing season,but there is much preparation required to shape the land and irrigation ditches.This requires almost one additional month making a total of nine months.

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	50	120	0	538	0	0	0
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0
February	40	0	0	860	0	0	0
March	14	24	18	645	0	0	0
April	10	0	12	538	0	0	0
May	13	0	12	538	0	0	0
June	6	0	12	538	0	0	0
July	13	0	0	538	0	0	0
August	6	0	0	538	0	0	0
September	6	120	20	538	0	0	0
Total	158	264	74	Total Water Applied=		5271 cu meters	

FOOTNOTES:

--One working day = 6 hours.
--Water distribution estimation based on ELTOBGY'S book.

CROP ENTERPRISE COST STUDY *

RICE AT ABU-RAIA (1), KAFR ELSHEIKH GVT.

Prepared by: 4Students& FAROUK ABDELAL
Identifier Code: TP-1,Trk-0,Fi1
Date Prepared: AUGUST 20,1979

EGYPT WATER USE & MANAGEMENT PROJECT

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Rice grains	Ton	2.5	65.000	162.50
Rice straw	Camel load	4.0	1.500	6.00
Total Income				168.50
Variable Costs				
Org. fert. transportation	Donkey load	250.0	0.050	12.50
Labor to spread org. fert.	Man hour	6.0	0.200	1.20
Plowing	Tractor hour	2.0	1.250	2.50
Buddling	Buddling/F	1.0	4.000	4.00
Nursary planting seeds	Kila	6.0	0.800	4.80
Labor to spread seeds	Man hour	1.0	0.200	0.20
Nursary plants pulling	Man hour	18.0	0.200	3.60
Transplanting	Boy hour	30.0	0.100	3.00
Weeding	B.orG. hour	24.0	0.100	2.40
CHEMICAL FERTILIZER		0.0	0.000	0.00
Ammonium Sulphate	Kg.	150.0	0.050	7.50
Super Trible	Kg.	50.0	0.070	3.50
Labor to spread chem. fert.	Man hour	6.0	0.200	1.20
IRRIGATION (2)		0.0	0.000	0.00
Sakia rent	Sakia hour	157.0	0.080	12.56
Cow or Bufflo rent	C.or B. rent	157.0	0.300	47.10
Labor to spread water	Man hour	157.0	0.200	31.40
HARVESTING (3)		0.0	0.000	0.00
Labor for harvesting	Man hour	30.0	0.200	6.00
Labor for bundlling	Man hour	8.0	0.200	1.60
Labor for loading	Man hour	3.0	0.200	0.60
Transporting by camel	Camel load	6.0	1.000	6.00
Thrashing	Machine hour	2.0	1.500	3.00
Winnowing	Machine hour	2.0	1.500	3.00
Total Variable Costs				157.66
Return Above Variable Costs				10.84
Fixed Costs				
Land rent	Month	6.0	7.000	42.00
Management charge	Month	6.0	1.000	6.00
Total Fixed Costs				48.00
Grand Total Costs				205.66
Return Above All Costs				-37.16

FOOTNOTES:

* This study for an area of one feddan.
(1) These data was collected from 4 study cases at ABU-RAIA site by IBRAHIM ELSHENNAWY , MOHAMED ELGAZZAR, ABDELHALIM ELSHERBINI, and Med.SALAMA Students from faculty of AGRICULTURE at KAFR ELSHEIKH, ECONOMIC DEPARTMENT.
(2) Rice needs adding water day after day and some times evrey day.iF.needs abou 8800 Cu. meters .
(3) Rice is the second most important export crop of EGYPT after Cotton . Rice nursaries are planted in late APRIL and in early MAY. Young plants transplanted to the fields one month later , usually during JUNE . Harvesting of rice starts in OCTOBER and continues in NOVEMBER .

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	41	0	0	0	0	0	0
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	24	0	0	960	0	0	0
June	48	0	30	1568	0	0	0
July	47	0	12	2520	0	0	0
August	47	0	12	2520	0	0	0
September	22	0	0	1232	0	0	0
Total	229	0	54	Total Water Applied=		8800 cu meters	

FOOTNOTES:

- Water reqairement based on our project researcch stations data .
- The quantity of water which is written under firest irrigation represents the quantity used in this month .
- Working day = 6 hours .

CROP ENTERPRISE COST STUDY *

MAIZE AT ABU-RAIA AREA (1)

Prepared by: GENE ,YUSEF & GAMAL AYAD — EGYPT WATER USE & MANAGEMENT PROJECT
Identifier Code: IP-1,Trk-1,F-5
Date Prepared: September 15,1978

Item	Unit	Number of Units	Price or Value per unit L.E.	Total income or Costs L.E.
Income				
Maize grain	Ardeb (2)	13.0	8.000	104.00
Green nessles for		0.0	0.000	0.00
animal feed.	Estimated	1.0	5.000	5.00
Straw	Camel load	6.0	1.000	6.00
Total Income				115.00
Variable Costs				
Organic fertilizer includes		0.0	0.000	0.00
transportation.	donkey load	300.0	0.060	18.00
Labor to spread manure.	Man hour	12.0	0.200	2.40
Land preparation:		0.0	0.000	0.00
rent of two cows.	Cow hour	24.0	0.180	4.32
Labor to balance plow.	Man hour	12.0	0.200	2.40
Rent of a plow.	Plow day	2.0	0.250	0.50
Seeds.	Kalla (3)	1.5	1.250	1.88
Labor for making ditches.	Man hour	6.0	0.200	1.20
Labor for cleaning ditches.	" "	6.0	0.200	1.20
Labor for thinning.	" "	6.0	0.200	1.20
Ammonium nitrate (31-0-0)	Kilogram	300.0	0.050	15.00
Labor to spread fertilizer ,		0.0	0.000	0.00
two times.	Girl hour	24.0	0.070	1.68
Weeding.	Man hour	18.0	0.200	3.60
Irrigation: (4)		0.0	0.000	0.00
Rent of cows	Cow hour	28.0	0.180	5.04
Rent of wheel.	Wheel hour	28.0	0.080	2.24
Labor to spread water.	Man hour	28.0	0.200	5.60
Boy to drive animal,for wheel	Boy hour	28.0	0.050	1.40
Harvesting:		0.0	0.000	0.00
Cut stalks.	Man hour	18.0	0.200	3.60
Pull cobs,tie straw in bundle	" "	18.0	0.200	3.60
Carry straw to village by		0.0	0.000	0.00
hired camel.	Camel hour	6.0	0.350	2.10
Carry cobs to village by don-		0.0	0.000	0.00
key.	donkey hour	10.0	0.100	1.00
Labor to load donkey.	Man hour	10.0	0.200	2.00
Boy to drive donkey.	Boy hour	10.0	0.050	0.50
Thresh corn by hand.	Woman hour	48.0	0.070	3.36
Total Variable Costs				83.82
Return Above Variable Costs				31.19
Fixed Costs				
Rent of land.	Month	4.0	5.000	20.00
Management charge.		4.0	1.000	4.00
Total Fixed Costs				24.00
Grand Total Costs				107.82
Return Above All Costs				7.19

FOOTNOTES:

* This study for an area of one feddan.
(1) Planting date is May 1 to May 31.Harvesting time is Sep. 1 to Sep. 30. Previous crop is wheat,flax,barseem or broad beans.Previous summer crop is cotton or rice.
(2) One ardeb of maize grain = 140 kilogram.
(3) One kalla = 1/12 ardeb = 11.67 kilogram.
(4) Irrigation before planting — 4 hours
***** after one month — 3 hours
***** after 1 month + 11 days — 3 hours
***** each 12 days (6x3 hours) — 18 hours
TOTAL irrigation hours — 28 hours

	LABOR DISTRIBUTION			WATER DISTRIBUTION, CU METERS			
	Man Hours	Woman Hours	Boy/Girl Hours	First Irrig.	Second Irrig.	Third Irrig.	Fourth Irrig.
October	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	34	0	4	350	0	0	0
June	20	0	20	275	275	0	0
July	17	0	19	275	275	275	0
August	17	0	9	275	275	275	0
September	46	48	10	0	0	0	0
Total	134	48	62	Total Water Applied=		2550 cu meters	

FOOTNOTES:

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