CHAPTER VI

CHAPTER VI

ECONOMIC FACTORS AFFECTING RURAL LAND USES

a. AGRICULTURE

History of Agriculture

With regard to the earliest stages of the story of Egypt's agriculture, there are various theories.(1) The most logical, attractive and not without reasonably valid support indicate that Egypt in thePaleeolithic Period was blessed with copious rainfall all over the country; what is now desert was then forest and grassland. Discoveries of fossil trees and the like support this. In these forests there were herds of wild animals. Kinds of flint implements and weapons suggest the hunter who found his food in the animals he killed. Fish hooks are also found, showing that he had learnt to exploit the River.

In the Neolithic Period that followed, the rainfall gradually diminished the river became narrower, the land at a distance from the valley dried up into desert. The inhabitants were driven by the force of changes nearer to the river banks and to the Faiyoum lake. Their range of hunting and their supply of game became more and more restricted; they came to notice more closely the growth of wheat and barley and to discover the natural and seasonal connection of crop and seed. Anchored to a far narrower area than before, they abandoned hunting and took to agriculture.

The Neolithic Period led through some thousands of years into what is known as the Pre-Dynastic period of Egypt, an epoch of relatively high civilization when metals were known and used, pottery was made in simple and even artistic shapes.

There is evidence of hunting far afield and even of trade by the route from Qift, in Upper Egypt, to Kossir on the Red Sea, with Asia for timber, this is where and how the Asians came to Egypt as already mentioned. There were kindoms and governors and some sort of polytheistic religion. There was a riculture based on wheat, barley and millet, also stock-breeding of goats, cattle and pig

(1) Francis, R. 'Agriculture in Egypt' Government Press, Cairo 1949

Then, there was a gradual transition from the earliest recognition of crop ..., sowing and harvesting up to the time when the first serious attention to ...gation was evident in the dykes built by Menes, the first recorded King of ...ited Egypt about 3,200 B.C. Probably, these were chiefly intended to assure ...e site of his capital city Memphis. The ancient papyri inform us of the cycles ...cultivation, guarding the dykes, breaking up the land; sowing then harvesting ... garnering the crops.

Also we have ample records of the actual implements in use. These were ...turally of primitive nature, yet the Fellah still uses the same type of imple...ents to this day.

Egyptian agriculture nowadays is characterized by a highly developed system ...f irrigation; a labour-intensive technique; lavish use of fertilizers; depend...ce on cotton; and markedly unusual distribution of property accompanied by ...ery small-scale tenure and farming.

...and Classification

...e lands on the Delta have been divided by Willcocks[1] as follows:-

a. In the south, the converted basins built at the beginning of the nineteenth century, upstream of an irregular line between Dillingat and Belbeis (see Map no. 22)

b. The deltaic land to the north of this line

These lands may be further sub-divided into the following belts:-

i. South of the line:

1 - 810,000 feddans nearest to the apex of the Delta and not needing drainage. These are the richest land in the Delta.

2 - 970,000 feddans north of the former, and capable of having their ground water maintained at a sufficiently low level by deep irrigation canals, and by free flow drainage in the existing drains.

ii. North of the line:

3 - 1,320,000 feddans of cultivated land needing drainage, generally by pumping

4 - North of the last mentioned area are 1,200,000 feddans without reclamation works.

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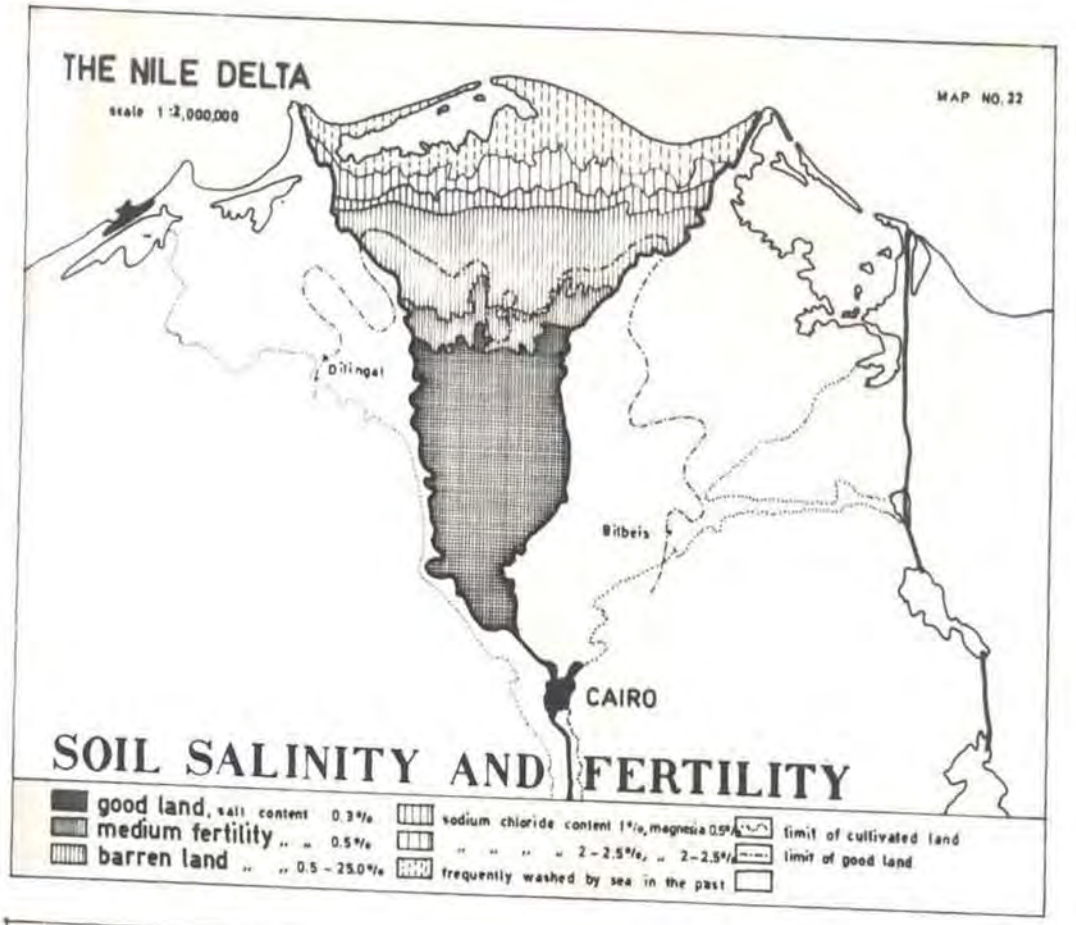
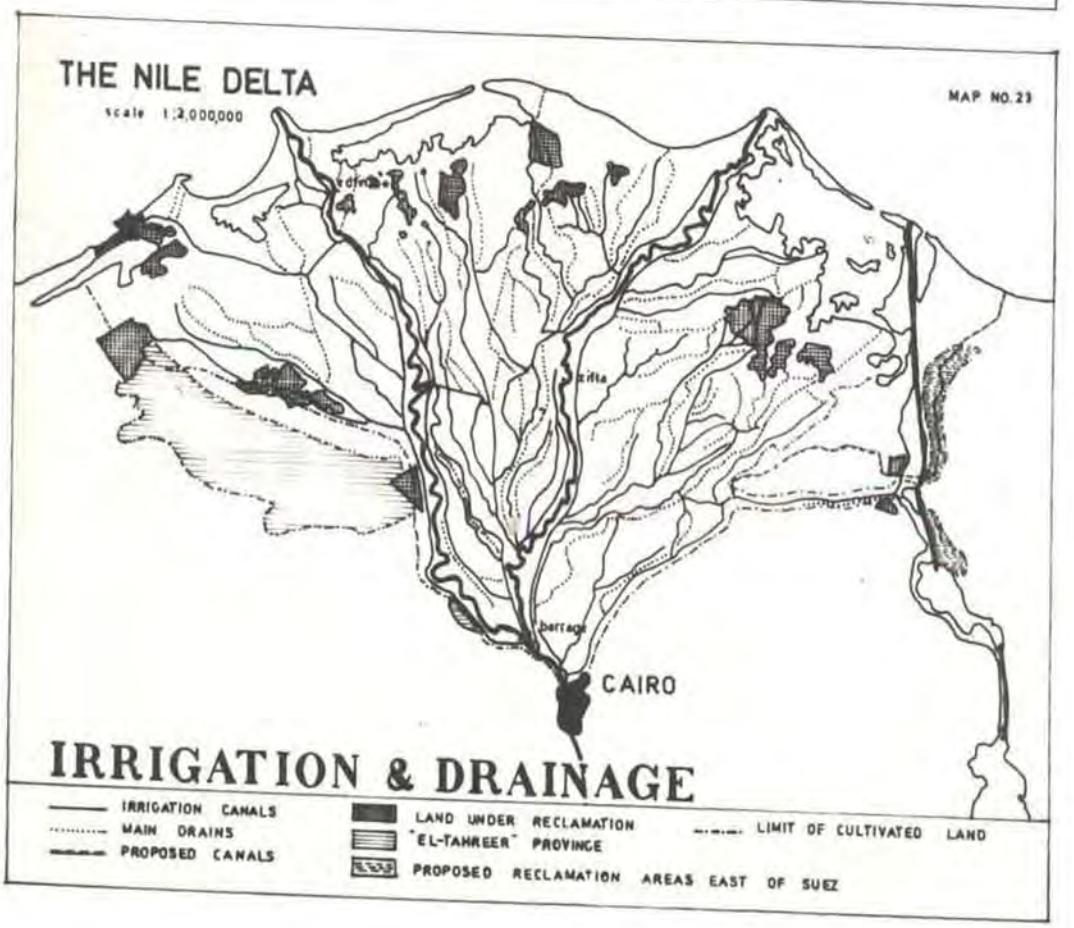
(1) Willcocks, Sir. W. and J.L. Craig. 'Egyptian Irrigation' vol.I London 1915


THE NILE DELTA
scale 1:2,000,000
MAP NO. 22
Damietta
Bilbeis
CAIRO
SOIL SALINITY AND FERTILITY
good land, salt content 0.3%
medium fertility 0.5%
barren land .. .. 0.5 - 25.0%
sodium chloride content 1%, magnesia 0.5%
.. .. 2 - 2.5%, .. 2 - 2.5%
frequently washed by sea in the past
limit of cultivated land
limit of good land


THE NILE DELTA
scale 1:2,000,000
MAP NO. 23
Damietta
Zifta
Barrages
CAIRO
IRRIGATION & DRAINAGE
IRRIGATION CANALS
MAIN DRAINS
PROPOSED CANALS
LAND UNDER RECLAMATION
"EL-TAHREER" PROVINCE
PROPOSED RECLAMATION AREAS EAST OF SUEZ
LIMIT OF CULTIVATED LAND

5 - There are the lakes, covering 66,000 feddans

6 - Between the lakes and the sea are 240 feddans of sand dunes with valleys and some level stretches of land capable of being perfectly cultivated with such crops as melons, and fruit trees.

The total area comes to 5,190,000 feddans excluding the Tahreer Province now in process of creation west of the Delta and which when completed will add a further one million acres.(1)

Irrigation

There are three storage dams on the Nile at Aswan, in Egypt and at Gabal el-Awlia and Sennar in the Sudan. The Aswan dam was completed in 1902. Its level has been raised twice in 1907 - 10 and 1932 - 4 now giving a storage capacity of 5.5 milliard cubic metres. The Gabal-et-Awlia dam provides Egypt with 4.5 milliard cubic metres.(2)

In Egypt the Esna barrage provides both basin and perennial irrigation for Upper Egypt and there are other barrages at Nag-Hamadi, Assuit and Deirut.

The Delta barrage, just north of Cairo, raises the level of Behera, which irrigated the eastern Delta, and the Tawfik canal, which irrigates the western Delta. The Damietta branch of the Nile is also raised by the small Zifta barrage (See Map no. 23)

The irrigation pumping stations of the Delta at Abul Managa, Balamon, Fua and Alf, fulfil the same function as the regulator barrages.

Finally, there are earth embankments built at the mouths of the Nile to keep back the sea and store the water needed for rice cultivation. Sealed in March, when the Nile reaches a low level, they are broken up during the floods in August. In 1951 the embankment at Edfina, on the Rosetta branch was replaced by a stone barrage.

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(1) The area of salt land unfit for cultivation in the Delta is estimated at 1,200,000 feddans. These lands can be brought under cultivation only if systematic large-scale washing out operations are employed, whereby the salts are removed in solution by the drained off water.

(2) Hurst, N.E. 'The Nile' Constable, London 1952.

These dams and barrages are supplemented by an elaborate network of irrigation canals, aggregating 22,000 kilometres. Fields are watered either by free flow or during low flood by mechanical means such as pumps of which there are about 37,000 in Egypt including primitive lifting buckets (50,000 Shadufs), (250,000 Archimedian screws), and 16,000 water wheels (sagias)

Due to the scarcity of rainfall and the inadequacy of irrigation, well water is needed, at least as a supplment. Deep underground water is recorded at a depth of 40 - 50 metres (175 - 155 feet) while shallow underground water may be found at 1.5 to 3.00 metres.(1) The map no. 29 shows the distribution of the water wells at Ashmoun.

Egypt is now provided with 12.000 kilometres of drains. Most of the land is still drained by free flow, but one million feddans in Lower Egypt are served by lift drainage and it is planned to extend this to another one million feddans. In 1949 there were 25 drainage pumping stations in Lower Egypt, served by three power stations.(2) Expansion was held back at the moment by the high cost of electricity.(3)

It is reckoned that in certain regions as much as one tenth of the cultivated area is taken up by drains. At present 50,000 feddans are drained by pipe drainage. This system saves land and water, requires less upkeep and reduces disease, but unfortunately, is more costly to install than the normal drains.

Rotation System

For irrigation purposes, water supplies have to be of adquate amounts, as far as possible, and suitably distributed throughout the year, With this end in view, an irrigation rotation is planned to make the best use of available supplies.

Water requirements differ from one crop to another and from one season to another. These requirements have been summed up by 'Hurst' (4) as follows:-

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(1)The underground water of the Delta has its origin in the river, with which it is in direct contact. When the river is in flood there is a lateral flow of the river water into the soil whereby the level of the subsoil water is raised, and as the river falls, a portion of this water finds its way back again into the river, and the level of the subsoil water correspondingly falls.
Willcocks Sir.W. ' J.L. Craig. 'Egyptian Irrigation' London 1913 vol. I

(2)Issawi.C.'Egypt at Mid-Century' Oxford Press. London 1954. Page 101

(3)Five stations are under construction in Northern Delta to serve new pur stations.

(4)Hurst. H.E. The Nile Constable London 1952.

1. In early summer; summer crop watering
2. Early flood months; further watering of summer crops, watering of the 'Sharagi' and maize cultivation requirements.
3. Late flood: watering of the 'Nili' or flood crops, the remaining summer crops, if any, and preparing for winter-cultivation.
4. In winter, watering of winter crops and preparation for the summer crops.

The crops follow a system of rotation covering a period of two or three years. Taking cotton first, the succession will be as follows: -

February	-	October	-	cotton
November	-	May	-	wheat, clover or barley
May	-	June	-	(partly fallow)
June	-	November	-	maize or rice
December	-	February	-	clover
April	-	October	-	cotton
November	-	May	-	winter cereals or clover
May	-	November	-	Maize (or fallow)
November	-	March	-	clover or winter cereals
March	-	June	-	(partly fallow)
June	-	October	-	Maize or rice
November	-	March	-	clover

The advantages of the rotation system are:-

1. The preservation of land fertility
2. The regulation of the cultivation process
3. Making use of irrigation water and regulating drainage by uniting the cultivation in collective areas.
4. Combatting harmful insects and weeds.

The rotation system is carried on in areas with large holdings and permenent settlers. On the other hand it is rarely carried on where small areas of holdings exist and where the farmers prefer to cultivate more food products as in the case of the provinces of Menoufia and Qualubyia which are the main food supply areas for Cairo.

The Acts No. 500 of 1955/56 and No. 501 of 1955/56 enforce that 33⅓ of every holding must be devoted to the cultivation of cotton and 33⅓ to grain.(1)

(1) Marii, S. 'Agrarian Reform in Egypt' Government Press, Cairo 1958. page 213

Cropping Year

The cropping year is divided into three overlapping seasons, namely 'Shitwi' or winter, 'Seifi' or summer, and 'Nili' or flood season. For irrigation purposes the cropping year is divided into similar divisions according to the availability of water supply. These three divisions whether for cropping or irrigation purposes, have each climatic conditions proper to them, mainly as far as temperature is concerned.

The seasonal distribution of crops in the Delta by feddans (calculated in 1927 was as follows:- (1)

Summer Crops	1,531,000 feddans
Flood crops	1,382,000 feddans
Winter Crops	1,919,000 feddans
Total Crops	4,832,000 feddans
Cultivated Land	3,114,000 feddans

Therefore, the area of crops per cent of cultivatable land is 155% (see Map no. 25) The cultivated area of the Delta comprises 3/5 of the whole cultivated area of Egypt.

The 'Hod' System of Land Division:

The 'Hod' is a defined area of land identified by number and by name. In Ashmoun, for example, both the flood land (the 'Gezira') and the main land are divided into a number of 'Hods'. Each village is a complete unit with its 'Hods' separate from those of other villages. A village may have from four 'Hods' - as in the case of Kafre-el-Saiid - up to thirty seven 'Hods' as in the case of Ashmoun Village. The area of each 'Hod' varies from one 'Hod' to another. It can be as little as 2 feddans or as much as 575 feddans (e.g. 'Hod' El-Gezira No. 11 in Ashmoun village)

According to the farmer the origin of such a division is based on soil type and land productivity, but this should not be taken as to mean the whole 'Hod' must be of a uniform soil and different from a neighbouring 'Hod'.

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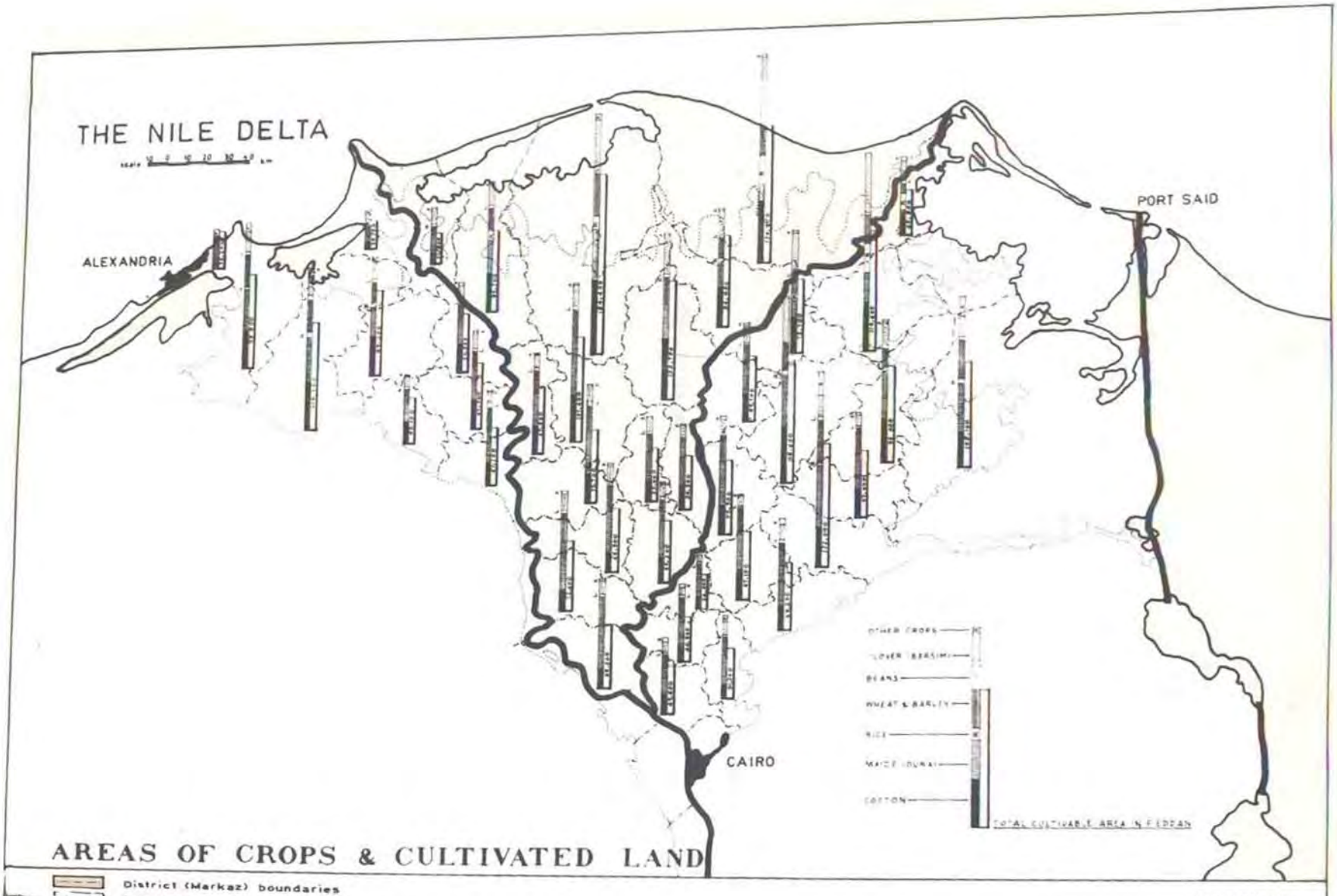
(1) Hurst. H.E. 'The Nile' London 1952, page. 77


THE NILE DELTA
ALEXANDRIA
PORT SAID
CAIRO
AREAS OF CROPS & CULTIVATED LAND
District (Markaz) boundaries
MAP NO. 25

Writing about 'Hods', Lyons[1] mentioned that although no special reference to such subdivision 'Hods' is made in the records of Ancient Egypt, it may well have existed, and he suggests that it was probably intended originally to afford a ready means of assessing tax.[2] In 1897 the 'Hod' was defined to be 50 - 100 fe dans of one piece of land with a regular shape and in the definition of which natural boundaries should be made use of whenever possible. The naming was left to the village authority.

Drainage:

Good drainage system was very essential as the subsoil water can be very injurious to field crops, vegetables and fruit trees.

There are different types of drains. Surface drainage is normally carried out through covered or uncovered drains. The uncovered drains usually occupy a considerable area in the utilized land (See map no. 23) This amounts to 10% of the cultivated lands.[3] Covered drains were recently introduced in Egypt. In this case drainage is taken at a depth of 2.5 metres instead of 1.5 metres of the uncovered drains. When compared with the irrigation network drains compose a similar but reversed 'Drainage Tree' starting with the small drain and ending in the largest one.[4] In Ashmoun there are 120 kmts of drains. There is a great need for more drains to raise the productivity of the land in this district, but the small holding system prevailing in the Delta as a whole, with its consequences of limited capital and the impossibility of reaching public drains, is the main hinderance to carrying out field drainage on the open drain system. This obstacle can be overcome through the introduction of covered drains and consolodation of lands.

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(1) Lyons.J. Cadastster Survey of Egypt, Cairo 1932
(2) Another possible explanation of the origin of the 'Hod' is that they may be natural consequence of subdividing the land for irrigation purposes.
(3) Marii.S. 'Agrarian Reform in Egypt', Cairo 1958, page 302
(4) Water in drains has great importance as it can be used for irrigation after special treatment. This depends on the composition of the drainage waters and the amount of salt they hold. This amount varies between 270 parts per million (i.e.0.027%) in the water of Bahr Saft drain, near Abu El-Shekuk (Sharqiya) and 1000 parts salt per million (i.e.0.1%) at the tail of that drain during flood. These proportions vary considerably during the year with respect to the flood season when the amount of salt is at its minimum. The percentage can be as high as 0.4% as was found in Sharakawia drain in the month of July.
(Sir W. Wilcocks, 'Egyptian Irrigation'.)

Irrigation Implements:

The different types of irrigation implements are:-

1. The most primitive one - the Shadouf which works as a lever.
2. The 'Tambouk' or Archimedes screw
3. The 'Tambout' or water wheel is made of wood and costs about £E 30
4. The 'Tamboushа' or water wheel made of steel and costs about from £E 59 to £E 74.
5. The pumps driven by steam power.

In his research in Agricultural Geography in the Delta, Dr. Nasr[1] found that the number of feddans which can be irrigated in 6 days (which constitute a single rotation during which water is available in the summer months), by the existing implements amounts to 185,322 feddan in the Ashmoun while the total area of the district is only 67,284 feddans. This means that the existing irrigation power-age could supply an area 2.7 times that of the Ashmoun. It was found that holders of 2 feddans and less are characterized by the 'Shadouf' and the 'Tambout' Holders of over 2 to 5 feddans inclusive, depend more on the best driven implements such as the 'Saquia' type, mainly the 'Tabout'. Holders over 5 to 20 feddans, though still depending upon 'Saquia'[2] type can be seen concentrating more on the more modern steel types of wheel. Holders of over 20 feddans show more dependence upon power-driven implements.

The Tabout irrigates one acre in 24 hours in the time of Sharaqui (very dry soil) but in ordinary cases during the cultivating period it waters two acres in the case of cotton, maize, beans or sugar cane. The Tambousha waters one acre in 6 hours in the time of Sharaqui (very dry soil) or in 3 hours if otherwise.

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(1) Nasr. N.S. 'Agricultural Geography' in the Delta', Cairo 1952

(2) Water wheel.

Land Tenure

Before the 1952 revolution about half the land was owned by large proprieters who were also large farmers, and employed atleast half the farm population as labourers; the remainder were peasant cultivators, the majority with dwarf holdings of under one feddan.

The land system was built up on the basis of Ottoman Law by the reforms of Mohammed Ali, and the system was one of complete individualism before the Land Reform Law of September, 1952. The main feature of the Ottoman Land Code was its division of Land into different categories.(1) These were :-

1. Mulk Land: land held in absolute freehold ownership. Landownership comprises two rights: the 'raqaba', or right of absolute ownership, and the 'tasarruf', or right to the usufruct of land. In 'mulk' tenure both rights belong to the individual.

2. Miri Land: land of which the 'raqaba' or absolute ownership belongs to the State, but the usufruct of 'tasarruf' to the individual. It is a form of heritable leasehold ownership in which the State leases land to the individual.

3. Wakf Land: land dedicated to some pious purpose

4. Matruka Land: land reserved for some public purpose as for example village threshing floors.

5. Mawat Land: dead or unreclaimed land.

Large Landlords, whether 'mulk' or 'miri' owners, as a rule used to let their land to small share-tenants. The Ottoman Code was not to help the cultivator, but to establish a claim to revenue by the Government.

Consequently the Ottoman Land Code was also opposed to the recognition of any type of collective ownership. 'The whole land of a village or of a town cannot be granted in its entirety to all of the inhabitants nor to one or two persons chosen from amongst them. Separate pieces are granted to each inhabitant

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(1) Doreen Warriner 'Land and Poverty in the Middle East' Royal Institute of International Affairs', London 1948, page 16

and a title is given to each showing this right of possession.(1)

The state of ownership has passed through a significant change in the first half of this century. With the increase in population, the class of small proprietors has increased far more than other classes.

The following table shows the changes in the land tenure structure due to fragmentation and heritage between 1896 and 1948.(2)

Table 21 Changes in Land Tenure between 1896 and 1948

Year	All holdings		Holdings of less than 5f		Holdings of 5 to 40 f.		Holdings of over 50 f.	
	No. 1000	Area 1000f.	No. 1000	Area 1000f	No. 1000	Area 1000f	No. 1000	Area 1000f
1896	767	5,002	611	994	144	1,816	12	2,192
1913	1,557	5,193	1,411	1,419	133	1,633	13	2,242
1929	2,176	5,794	2,019	1,708	144	1,759	13	2,327
1939	2,481	5,837	2,323	1,915	146	1,674	13	2,180
1948	2,721	5,938	2,565	2,056	144	1,754	12	2,128

Small holdings of less than one feddan increased in number as showing in the following table:-(3)

Table 22 Increase in Holdings of less than 1 feddan 1913 - 48

Year	Number	Area
1913	942,530	405,595
1929	1,475,777	569,464
1939	1,751,587	701,857
1948	1,980,098	818,524

(1) Issawi, C. 'Egypt at Mid-Century' Oxford University Press, London 1954. page 126
(2) Doreen Warrimer 'Land and Poverty' in the Middle East' London 1945.p.17
(3) Doreen Warrimer 'Land and Poverty in the Middle East' London 1945.p.37

This means that during the period between 1896 and 1948 the area held by all holders increased by about 107% while the number of small holders themselves increased by 320%. Most of this increase has been in the area devoted to farms of under one feddan. This state of land fragmentation is still deteriorating and will continue to deteriorate unless drastic measures are taken to stop it.

The state of land ownership before the Land Reform Law introduced in 1952 was as follows:- (1)

Table 23 State of Land Ownership before the Land Reform Law 1952

Size of holding in feddans	No. of holdings	% of total holdings	Total area	% of total area	Average size of holding
Less than 1 feddan	2,018,132	71.7%	777,865	13.0%	.39f.
From 1 to 5 "	623,746	22.3%	1,343,999	22.5%	2.15f.
From 5 to10 "	79,259	2.8%	525,904	8.8%	6.64f.
From 10 to 50 "	69,115	2.5%	1,291,423	21.5%	24.89f.
From 50 to 100 "	6,378	2.0%	439,494	7.2%	67.34f.
From 100 to 200 "	3,184	1.0%	436,775	7.3%	137,18f.
Over 200 feddan	2,136	0.6%	1,176,801	19.7%	550.00f.
	2,801,950		5,982,361		2.14f.

The above figures show that a minority of owners (0.6% of the total number) held estates of over 200 feddans each and these together occupied almost one fifth of the cultivable land, whereas the great majority of owners (94%) only possessed holding of under 5 feddans together making about one third of the cultivable land. In fact over two million of the owners possessed no more than 1 feddan each amounting to about 13% of the cultivable area - this representing about two thirds of the amount of land held by the 2,136 large land owners. The Distribution Department of the Higher Committee of Agrarian Reform estimated that by 1958 the ownership pattern as a result of the Land Reform Law would

(1) Marii, S. 'Agrarian Reform in Egypt', Government Press, Cairo 1958, page 247

Table 24 the following form:(1)

Table 24 State of Land Ownership afterhthe Land Reform Law of 1952

Size of Holding in Feddans	No. of holdings	% of total holdings.	Total area	% of total Area	Average size of holding
Less than 5 feddan	2,869,878	95.0%	2,945,065	49.3%	1.026f.
5 - 10	79,259	2.6%	525,904	8.8%	6.66 f.
10 - 50	69,115	2.3%	1,281,423	21.5%	18.55 f.
50 - 100	6,378	0.2%	429,494	7.2%	67.11 f.
100 - 200	3,184	0.1%	436,775	7.3%	136.58 f.
200 feddan only	1,768	0.058%	353,600	5.9%	200.00 f.
Total	3,029,572		5,972,261		

The above figures show that after the implementation of the Agrarian Reform law and thbf fixing of the minimum limit of ownership at 200 feddans, the large landowners are left with about 6% of the total cultivable land. After land redistribution the number of small holders with less than 5 feddans each represent 95% of all owners and possess 49.2% of the total cultivable land, i.e. about half the arable land of the country. This means that the Agrarian Reform Law had increased the small holdings while reducing the size of the big estates. This result will not affect the output of the land as a consequence of increasing the number of small holdings, since the change will bemainly one of title rather than of agricultural operation, large units continuing to be cultivated as such through co-operative means prescribed by law.

One of the main features of the cultivated land is the dispersal and the fragmentation of holdings, The total area of the arable land is 5,962,662. feddans composed of 2,760,000 holdings owned by 1,003,023 owners (in 1950)(2) i.e. one owner for more than one holding. The majority of landowners own small

(1) Marii. S. 'Agrarian Reform in Egypt' Government Press, Cairo 1958.p.247
(2) Marii. S. 'Agrarian Reform in Egypt' Government Press, Cairo 1958.p.190

sized holdings and yet these holdings are broken down still further into plots separated one from another and sometimes lying within the boundaries of different villages. These holdings are subdivided into 6 million plots. Taking an average, the figures show, that each holding, as far as the ownership per individual is concerned, is divided into 6 plots, and the average size of the plot is less than one feddan.

This distribution is seen in the following table:(1)

Table 25. Distribution of Land Holdings

No. of Plots	No. of Owners	Area in Feddans
1	381,151	1,116,813
2	279,994	1,117,997
3	173,448	1,037,113
4	78,224	663,174
5	33,879	406,100
6	20,814	320,942
7	9,107	174,980
8	8,302	194,900
9	2,933	71,612
10 and more	12,869	939,884
Not known	3,252	51,409

The following table shows the number of holdings of less than 5 feddans sub-divided into one or more plots.(2)

Table 26 Subdivision of Holdings of less than 5 feddans

No. of Plots	Area in Feddans	No. of Holdings	Average Area perplot	
			Feddans	Kirats
1	429,806	351,109	1	5
2	476,828	466,324	-	20
3	304,106	638,778	-	20
4	121,724	176,020	-	17
5	45,876	75,825	-	14
6	21,770	42,330	-	13
7	8,249	18,483	-	11
8	5,415	13,864	-	9
9	1,818	5,202	-	8
10 and over	2,898	16,320	-	8

The numbers of holdings which are more than 5 feddans subdivided into four or more plots are shown in the following table.(1)

Table 27. Subdivision of Holdings of More than 5 Feddans

No. of Plots	Area in Feddans	No. of Holdings	Average Area per plot	
			F	K
4	362,064	130,752	2	18
5	210,943	82,820	2	13
6	175,406	76,296	2	7
7	84,148	41,517	2	-
8	93,036	46,728	2	-
9	32,043	18,693	1	17
10 and more	161,211	122,775	1	7
Total	1,118,851	519,081		

From these tables it follows that there are some 2,537,291 feddans (about 42.5% of the whole cultivated area of the country) divided into 2,063,320 holdings constituting independent units each of which is divided into small separate plots of less than 3 feddans a piece.

The existing system of land tenure and the consequent dispersion and fragmentation of holdings have given rise to the following effects:-

1. An undue increase in the number of workers per land unit
2. The spread of land renting.(2)
3. An inordinate increase in rental values

Fragmentation also has marked repercussions on the efficiency of agricultural production and these aspects will be dealt with later in this Chapter.

(1) It has been estimated that 60% of the cultivated land is rented (Said's estimate was 75%)

(2) Marii, S. 'Agrarian Reform in Egypt'. Government Press, Cairo 1958. page 191

Taxation System:

There were three kinds of taxes during the rule of Mohammed Ali: (a) Tax on orchards, (b) Tax on trees and Palm Trees, (c) Tax on cultivated land. The value of the tax was equal to that of 1/10 of the production in the first and second kinds. In the third kind the value was not less than the equivalent of two 'Mesht' nor more than 21 'Meshts' per feddan(The Mesht equals 2.25 piasters, i.e about six pence)

In 1844 the tax was raised by 12.5% then in 1853 it was raised by 17% and in 1956 the value was not to be less than Pt. 25 (i.e. 5 shillings) and not more than PT 100 per feddan.

In 1899 the tax value was fixed at 28.64% of the annual rent of the land. This was beside additional taxes for irrigation improvements and the like.

In 1935 the law had fixed the tax value to be 16% of the annual rent up to a maximum of Pt.164 per feddan. This value was reduded to 14% in 1949. The taxpayer who paid taxes of a value between £E 2 and £E 20 was to get a £E 2 reduction. This reduction was increased to £E4 in the 1951 Act and was maintained at this level by the 1952 act.

Tenancy System:

In addition to the normal system of each rental there were two systems of tenancy before the Rural Reform Law came into effect in 1952.

a. El-Muzaraa System (cultivating system): In this system the farmer- the tenant - was to cultivate the land at his own expense while the land-owner helped him in providing the necessary seeds for cultivation together with various manures. In this case the land production was to be divided equally between the tenant and the land-owner, the latter being liable for the land tax.

b. El-Mukhamasa System (the one fifth system): This system was also practised before the Land Reform Law. In this system the tenant had to pay all the expenses of cultivation, seeds and manures, while the land-owners paid the tax. In this case the land-owner took three-fifths of the production of cotton and wheat

while the tenant got the other two fifths of the production. Other cultivation products were to be divided equally between the land-owner and the tenant.

Once taxes were determined they tended to remain fixed but there was no corresponding fixing of rents which in fact continued to rise. The Land Reform Act of 1952 has met this problem by fixing the rent of land to be seven times the amount of tax levied on it, this implies an average rental price of between £E30 and £E 40 per feddan per annum for first grade land. The 1952 Act also regularises the El-Muzarraa System but abandons all other forms of arrangement between land-owner and farmer-tenant.

...icultural Labour

To the soil the Fellah devotes all his energies, he belongs to the land rather ... the land belongs to him. During the periods of heavy work, preparing for the ...tton, sowing, fighting the cotton pests, harvesting the wheat, he has to work ...day and a great part of the night and early morning.

Those who are engaged in agriculture fall into two main groups: land-owners ... land labourers, the latter forming 38% of the rural population. Up to the 4 ...5 feddan size group of holding, holders can provide their own labour.(1) On ... larger holdings, however paid labour exists. The latter is of two categories.

1. 'Tamallia' or personal labour and can be paid in kind or in cash.
2. A Share cropper; if theowner pays the taxes and irrigation dues. provides the farm implements, cattle, seed or manure, the Fellah provides labour. For this he receives 1/5 or $\frac{1}{4}$ of the yield of his plot.

It has been observed that from existing conditions two farmers are able to ...ltivate five acres, 4 farmers, 10 acres and 6 farmers 20 acres.(2) This is, ... course, apart from the women and children who normally participate in the work.

The Land Reform Law has fixed the minimum daily wages for agricultural labour ... P.T. 18 for the man and P.T. 10 for the woman or the boy(3). The working ...urs have been fixed at 8 hours a day. But these measures are not seriously ...served by most of the land-owners.

...ricultural Labour Status

The agricultural conditions which prevail in the Nile Delta make it rather difficult to define accurately the type, amount and relative efficiency of agricultural labour. It is also misleading to make any comparison between the

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(1) M. Said. Agricultural Economy. (Arabic Text) El-Nahda, Cairo 1954.p. 48
(2) Observation of the Author in Ashmoun District during survey
(3) Marii. S. 'Agrarian Reform in Egypt' Government Press.Cairo 1958 page 395

atus of agricultural labour in the Delta and that in any country in Western urope. The main feature which characterizes the agricultural land in Egypt is that the total net cultivated area, which is 6 million feddans, comprises 9 million feddans of cropped area. It is also difficult to define the population engaged in agriculture as nearly every person in the rural family gives a hand in the cultivation except the very young children. The determination of the size of family is also a matter of some difficulty through complications in the composition of the household.

However, the phenomenon of agricultural under-employment or hidden employment as Issawi puts it,(1) is evident. It is well known that while there is little official unemployment in the rural areas, there is an enormous amount of hidden unemployment.

The determination of the scale of unemployment has been the subject of a variety of views, estimates and considerations regarding the labour requirements of each kind of crop as well as the optimum standard of living desired.

The minimum area necessary to ensure economic use of the land has been found to be 3 feddans (according to the research works of the Agrarian Reform Distribution Department)(2) This is stated to be enough to absorb the labour of an average sized family using local implements; and it can provide a reasonable living for an average family of six persons, with an average of $\frac{3}{4}$ of a cropped feddan per individual. This means that 12 million people can live directly from agriculture. This figure is very near to the 13 million people who are stated in the general census to be actually engaged in agriculture.

It has also been stated that a family of 8 was economically sufficient to cultivate 5 feddans.(3) This estimate would bring the total population directly living on agriculture to be 9,600,000. This figure gives an excess of 3.4 million people engaged in agriculture. In another estimation, M. Habashi(4) put the total needs of Egyptian agriculture in 1939 at 370 million to 394 million man days, this, assuming 300 working days per annum (which actually is about 210 days)(4) and a permanent staff of engineers, keepers, clerks etc., of 132,000 gives employment to only 1,300,000 to 1,400,000 men and 400,000 to 650,000 women

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(1) Issawi, C. 'Egypt at Mid-Cenutry' Oxford Univ. Press. London 1954. page 241
(2) Marii. S. 'Agrarian Reform in Egypt' Government Press, Cairo 1958. p.92
(3) Lucouture, J.&S. 'Egypt in Transition' Methuen, London 1958. page 331
(4) Issawi. C. 'Egypt at Mid-Century' Oxford Univ. Press, London 1954.

and children, i.e. a working population of about 2 million supporting a rural population of about 4.6 million, compared with an existing rural population, at that time of about 14 million. But it seems that these estimates were based on a highly developed kind of agriculture which is very different from the form of agriculture now existing. Cleland[1], in 1939 found that, whereas the average area farmed by a peasant family was 1.6 feddans, it was possible for a family to cultivate five times that area on the existing methods. This suggests that one-fifth of the present farm labour might be able to maintain the present volume of production. He also considered that a safer estimate of the surplus would be one-half of the farm population. This puts the surplus at 6.5 millions. From the living standard point of view Dudley Stamp[2] has found that at the Western European standard of productivity per acre (and Egypt has, more or less reached such a standard) an acre can support one member of the rural population. If we take this estimate in consideration and compare it with conditions in Egypt, we find that the total rural population should amount to 9 million giving one cropped feddan per person. When due allowance is made for a lower standard of living, the total rural population can be estimated at, say 13,500,000. But since the present total rural population is 18 million this figure implies an excess of about 4.5 million, a figure which is generally accepted by the authorities. If we compare this figure with the figure of 3.5 millions representing the excess of population directly dependent on agriculture (which was arrived at on the basis of estimating that a family of 8 would suffice for the cultivation of a 5 feddan unit) it will be appreciated that the two estimates tend to confirm each other since the first represents the excess of total rural population. This means that about 30% of the population providing the labour engaged in agriculture constitute an excess on the land. Or, according to the previous assumption that one cropped feddan is sufficient for one person 25% of the total rural population is considered as an excess. These figures are very near to those arrived at from N. Nasr's[3] theory which has been applied later in the District of Ashmoun.

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(1) Cleland, W. 'The Population Problem in Egypt', London 1936
(2) Stamp. D. 'Our Undeveloped World', Faber, London 1940
(3) Nasr. S. 'Agricultural Geography in the Delta', Cairo 1955

N. Nasr. built his calculations of the excess of labour and population on the basis of a family farm of five feddans. On this basis a feddan per working member of the family is considered as the optimum both for self-sufficiency and use of labour. Instead of considering the number of feddans of the cultivated land in the village to be sufficient for an equal number of population to be engaged in agriculture, he differentiated between the areas held by small holders and the area held by holders possessing more than five feddans each. The latter is divided by 5 to give the equivalent in holders of 5 feddans each. This is then added to the number of the existing small holders to get a theoretical total number of the existing holders. The latter number is then compared with the theoretical total number of the holders for the whole area, i.e. the total cultivated area divided by 5. The difference gives the theoretical shortage or excess in the number of holders, and then, if multiplied by the working family size (viz 5 persons) it will give the shortage of excess in the number of population engaged in agriculture. The following example of the village of Darawa (population 9257) in Ashmoun, illustrates this method:

Village	Cultivated area	Theoretical Number of Holders	Existing Holdings			Total	Excess of working population
			Small	Large			
			O	A	E		
Darawa	2212 f's.	442	530	1550f.	310	840	398 x 5 = 1990

O = Number of small holders
A = area held by large holders
E = equivalent in holders.

This method, although less straight forward than some of the others gives more consideration to the state of tenure in each village. On the other hand it tends to ignore the living standard of holders of less than 5 feddans. Nevertheless the method provides a compromise in the form of a combination of the theoretical and the actual surplus of population on the cultivated land.

This feature of agricultural hidden unemployment has been caused by the much greater increase in the amount of agricultural labour as compared with the increase in cultivated and cropped area. The waste in man-power is seen to be greater in the areas where the holdings are small in size and where more pressure on land and more sub-division of land occurs.

The agricultural year as far as labour is concerned, and this is characterized by a long season of under-employment, and this under-employment season varies from one province to another. In Ashmoni, for example, theoworking year is around an average of 210 days for adult male labour, 180 days for female labour and 160 days for young labour. This means that the under-employment period is about five months. This is the time for subsidiary farm industries.

Labour requirements per fedan for the main crops are shown in the following table which was reproduced by M. Said(1). The table also shows the labour costs per feddan of every crop. (1950)

Table 28. Labour Requirements and Cost per feddan of the Main Crops

Crop	Man-day	Child-day	Labour Cost (£E)
Cotton	41	87	10.75
Wheat	27	4	3.74
Barley	18	3	2.54
Beans	19	5	2.82
Onions	33	70	7.72
Barseem (clover)	25	3	3.15
Millet	42	11	5.14
Maize	25	10	3.71
Rice	35	40	9.26
Sugar-Cane	76	31	11.07
Ground Nuts	41	35	8.95
Sesame	28	4	4.20

Owing to the fact that most of the work is done by unpaid members of the farmer's family and the draught animals used also belong to him, it is difficult to get an exact analysis of cost.

(1) Said.M. 'Agricultural Economy', (Arabic Text) El-Nuhda, Cairo 1954. page 51

According to the law of diminishing returns which can be noticed from the figures below, given by Said [1] for the total production of wheat on an area of 100 feddans with different numbers of labourers, not only does the total output decrease after a certain point but also do both average and marginal production, with addition of more labour on the land as a result of increasing pressure on land excessive sub-division of this land. The marginal production attains the minimum when four labour units operate.

Table 29 Total Production of Wheat on 100 feddans with Different Numbers of Labourers

No. of labourers on 100 feddans	Total production of wheat - ardabs	Average production (per unit of labour)	Marginal Production - ardabs
1	30	30	50
2	80	40	50
3	150	50	70
4	220	55	70
5	290	58	70
6	354	59	64
7	420	60	74
8	475	59.5	55
9	531	59	56
10	580	58	59
11	616	56	36
12	648	54	32
13	682.5	52.5	33.5
14	700	50	17.5
15	735	49	35
16	760	47	35
17	765	45	5
18	775	43	10
19	776	40.5	1
20	700	35	- 75
21	672	32	- 28

(1) Said, 'Agricultural Economy' (Arabic Text) El-Nahba Cairo 1954.

The following table shows the occupational status of the agricultural population in 1939 (1)

Table 30 Occupational Status of Agricultural Population in 1939

Occupation	Male.	Female	Total
Working on own land (farm)	778,000	67,000	884,000
Unpaid member of family working on farm (over 15 years of age)	620,000	160,000	780,000
Unpaid members of family working on farm (under 15 years of age)	534,000	191,000	725,000
Hired workers (over 15 yrs)	796,000	114,000	910,000
Hired workers (under " ")	551,000	167,000	718,000
	3,279,000	699,000	3,977,000

Cultivation Implements:

Most of the implements used are of the type depicted in the Ptolemaic temples while the high yields obtained by progressive land-lords and government stations show that the ordinary methods of sowing and tilling could be considerably improved upon. Egyptian agriculture is wasteful in its use of time, of seeds, of berseem (clover) as fodder and of dung, which is used as fuel. But the absenteeism of the many landlords and the illiteracy of the peasants has slowed down, though it has not stopped, the diffusion of technical improvements. (1)

The cheapness of labour and the skill of the fellah with his traditional instruments have held up the use of machinery. Further obstacles are the very small size of individual plots and the planting of many different crops over a small area, the poverty of the farmers, the weakness of the co-operatives, the fact that the fields are cut up into small patches by canals and drains and the nature of cotton cultivation which does not lend itself to mechanization. As a

(1) Issawi, C. 'Egypt at Mid Century' Oxford Univ. Press, London 1954. page 127
(2) Ibid. Page 106

sult, whereas on highly mechanized American farms a hectare of wheat requires ly five man-days of labour for ploughing, sowing, reaping and threshing, in gypt a feddan of wheat (0.4) hectare) requires forty man-days.(1)

In recent years, however, the number of tractors rose from 1,200 before the r to over 7,000 in 1957 owing to the fact that on large estates, tractors are heaper than the traditional methods. S. Saffa(2) puts the cost of ploughing by tractor at PT 16 per feddan per day against PT 70 for a plough and a pair of bullocks. It is doubtful whether this trend is to be welcomed, in view of the already enormous redundance of rural labour and the absence of alternative employment. (See 'Mechanization' later in this chapter) There are also 13,400 machines with a total horse power for irrigation and drainage.

Egyptian agriculture is one of the most advanced due to the utilization of chemical fertilizers. The average consumption of chemical fertilizers has risen from 500,000 tons per annum to about 800,000 tons of fertilizers at present, giving an average of 44 kg of nitrogen per cultivated hectare, against 23 in the U.K. and 7 in the U.S.A.(3) This average is due to be increased in the future owing to the rapid expansion of this industry.

Ploughing: The type used is the native plough costing about £E 2. The action of ploughing in the Delta with its dry soils and the lack of a grass cover is essentially simpler than in Western Europe. The need arose for an implement easy to use and cheap to own by a small holder. The depth of ploughing from one area to another. This varies from 7.5 to 35 cms. The native plough ploughs to an average depth of 15 to 18 cms., but with some adaption great depths can be reached.(4)

The time needed for ploughing one feddan by the native plough depends on the type of soil and degree of moisture and other factors, and varies between 1.5 and 3.5(5) days. The holdings of 4 - 5 feddan size group can be said to be of a size

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(1) Issawi, C. 'Egypt at Mid Century' Oxford Univ. Press, London 1954. page 106
(2) Saffa.S. 'Economical and Agricultural Exploitation in Rural Egypt, article L'Egypt Contempaire, Cairo 1949
(3) Issawi,C. 'Egypt at Mid Century' page 107
(4) Nasr. N. 'Agricultural Geography' in the Delta, Cairo 1953
(5) Author's observation during survey.

uitable for one native plough. The European type of plough can be suited to 5 - 10 size group or even 200 - 500 size group.

Levelling: Levelling is only occasional and may be done every four or five years on land continuously cultivated. The 'Kassabyia' or the scraper, costing about £E 4 is the main implement used for the purpose.

The 'Lawwata' is another local implement used for levelling the land while it is under water.

Apart from ploughing and levelling official records show only threshing and winnowing machines and implements. Land smoothing, harrowing, rolling, dividing and ridging as well as several other practices take place before the crop is ready for threshing and winnowing, and are of no less importance.

Harrowing and smoothing the soil are not part of the small farmer's practices. Compacting or pressing the soil is of greater importance, and is generally carried out by means of the native implement called the 'Zahhafa' which costs about £E 3. The average work of the 'Zahhafa' is five feddans per day.(1)

The arrangement of the field into ridges and basins is carried out by two main implements. The first is the 'Tarrad-el-Takhtit' which works an average of 2 to 3 feddans a day. The second is the 'El-Battama' which is used for dividing into small parcels rather than for ridging. The 'Battama' works an average of 4 to 6 feddans a day(2) The 'Massah' and the hoe 'Fas' are also generally used.

Sowing: This is carried out by three methods: 1. Broadcast (Baddar), 2. Drilling (Talkit), 3. Dibbling broadcast (Nakr). The job is done by hand. A broadcast sowing machine is rarely used except on large farms where its capacity is from 8 to 12 feddans per day.(3)

Harvesting: The common implement used is the sickle for cereals and a fine sharp chopper for maize and sugar-cane. In the case of cottong, casual labour generally boys and girls provide the picking hands.

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(1) Author's observation during survey.
(2) Author's observation during survey in Ashmoun.
(3) Ministry of Agriculture information Office. Cairo.

Threshing, Shelling and Winnowing: For threshing, the 'Norag' is generally used. he 'Norag' takes 4 to 5 days to thresh a feddan yield of wheat. Four 'Norags' thresh 0.75 of a feddan yield per day.(1) One or two beasts can be used.

Locally constructed threshing machines are generally employed. In most cases they thresh, winnow and sieve at the same time. On a farm of 500 feddans, a threshing machine is sometimes used.

The price of the 'Norag' varies between £E 12 and if the main body is made of wood and £E 24 if all is made of steel.

The holdings of 5 - 10 feddan size group show a close balance between area and the 'Norag'.

These facts emphasize the importance of considering the 5 feddan size group to be the limit between small and larger holdings.

Agricultural Production and Land Values

During the last forty years the value of agricultural production has only just succeeded in keeping pace with the population in spite of much technical research and improvements of methods of cultivation.(2)

Naturally agricultural output varies from one place to another according to the fertility of the land, services, irrigation and drainage of the land. These factors also determine the land value in the different districts of the Delta. Owing to the pressure of population on the very limited land resources, and because of the absence of alternative employment, land values have risen enormously. The average land value per feddan in the different districts of the Delta is shown on map no. 24.

The net income from cultivating one feddan also varies from one place to another according to the output. Variations in income are also due to changes in world marketing conditions particularly in the case of cotton. In the year 1949 - 1950 the agricultural lands of the Delta gave the following yields per feddan under different crops.(3)

(1) Author's observation during survey in Ashmoun
(2) It has risen from £E115 million in 1914 to over £E 300 million in 1957
(3) Ministry of Finance, M. Bulletin of Agricultural & Economic Statistics May 1951

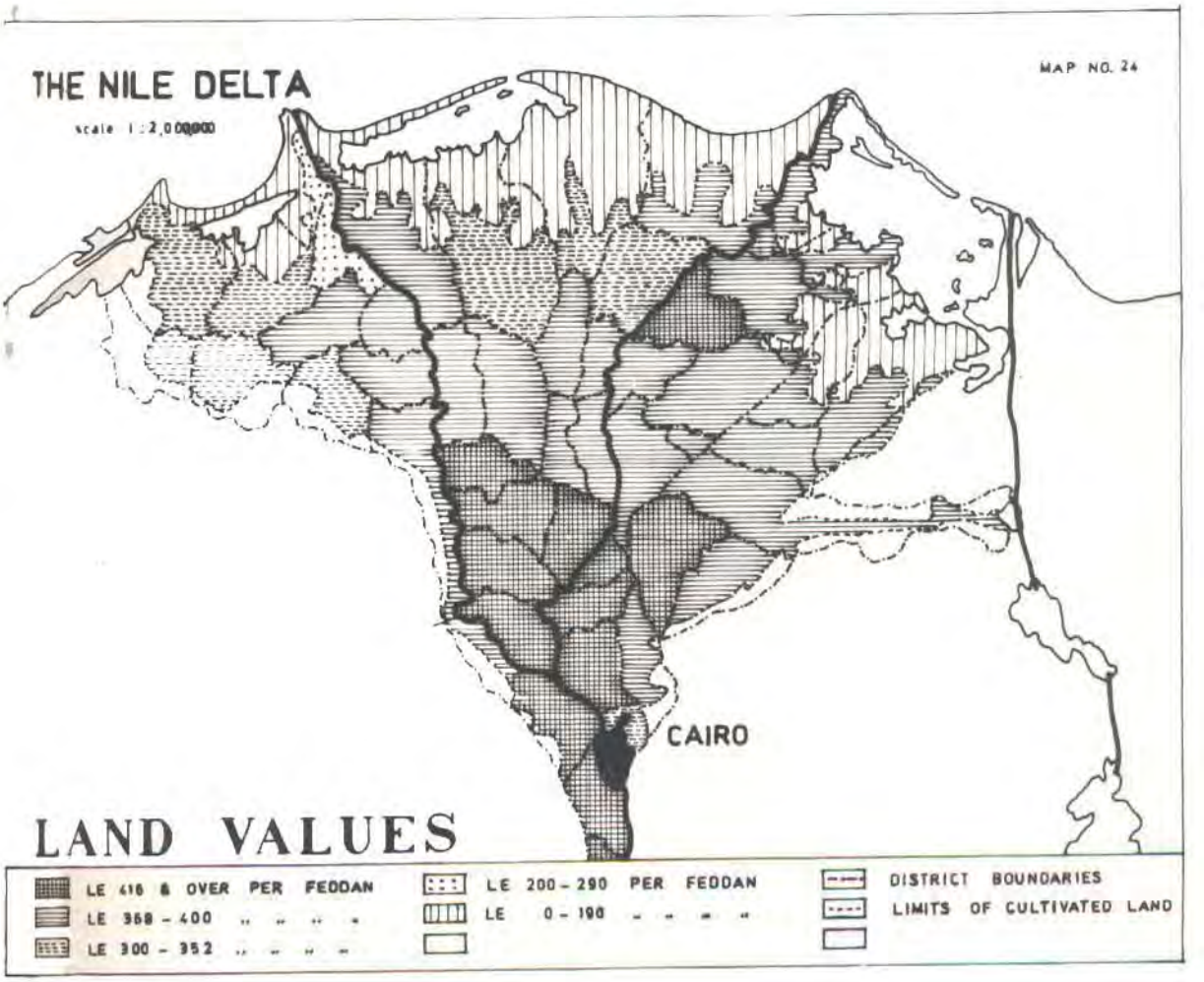
THE NILE DELTA
MAP NO. 24
CAIRO
LAND VALUES
LE 416 & OVER PER FEDDAN
LE 368 - 400 " " " "
LE 300 - 352 " " " "
LE 200 - 290 PER FEDDAN
LE 0 - 190 " " " "
DISTRICT BOUNDARIES
LIMITS OF CULTIVATED LAND

Table 31 Yields of Agricultural Lands under the Main Crops (1944 - 1950)

Crop	Cultivated Area in Feddan	Average Yield per feddan	Value in £E of output per f.
Cotton	1,198,256	4.18 Kantar (100lb)	70 - 100(1)
Wheat	836,134	4.60 Ardab (5.44 bushels)	25
Beans	141,441	2.88 Ardab	12 - 15
Barley	64,700	6.46 Ardab	
Maize	1,017,362	6.45 Ardab	32
Rice	673,778	1.91 Dariba	28 - 40
Clover(Barsheem)			8 - 27 (2)

In the country as a whole the agricultural production value has risen from £E 252 millions in 1952 to £E 312 millions in 1957. In the same time the cultivated area has risen by 317,000 feddans of rice; 103,000 feddans of vegetables 13,000 feddans of orchards; 17,000 feddans of sugar-cane; 12,000 feddans of beans; and 13,000 feddans of onions.(3)

The net income from cultivation also depends on the expenses of services, fertilizers and cost of labour. It was found the labour expenses amount to 30% of the total income and the cost of services and fertilizers varies between 20% and 45% of the gross income.(4)

In the village of Silwa, Dr. H. Ammar(5) found that the net annual income from cultivating one feddan and the profits derived from one cow, five sheep and other animals amounts to £E 59.5; and as the per capita proportion of land is about 1/3 of a feddan then the per capita income from agriculture is about £E 20 per annum.

(1) The price of one kantar varies between £E15 and £E17 for the Gize to £E18 to £E20 for the Menoufi and £E20 to £E 25 for the Karnak according to world's market.
(2) The clover output value is about £E8 per feddan in summer and£E27 in spring.
(3) Al-Ahram - Newspaper 7th July, 1958
(4) Saiid, M. 'Agricultural Economy' - Cairo 1954
(5) Ammar, H. 'Growing Up in an Egyptian Village' Kegan Paul, London 1953

The following table, which is reproduced by G. Said gives estimations for the cost and return of the different crops based on 1948 - 1949 prices.(1)

Table 32 Costs and Returns for Main Crops per feddan in £E

Crop	Costs 1948 - 1949				Average Profit. 1945-8
	Rent	Costs of Cultivation	Total Costs	Value of Product	
Seifi Crops					
Cotton	16.6	16.7	33.3	44.1	12.6
Rice	9.4	15.3	24.7	30.1	2.5
Millet	8.6	9.9	18.5	14.8	-2.4
Sugar-Cane	23.1	29.9	53.0	61.2	7.2
Shetwi Crops					
Wheat	11.4	11.2	27.6	16.2	-3.8
Beans	10.0	7.1	17.1	19.6	2.8
Berseem	11.7	6.6	18.3	28.8	1.8
Onions	16.7	21.1	37.8	58.8	17.7
Flax	12.1	13.8	25.9	28.4	8.3
Potatoes	-	-	70.3	80.6	10.4
Nili Crops					
Maize	7.0	12.4	19.4	16.9	-1.8
Vegetables					
Seifi	14.0	23.0	37.0	45.0	11.7
Shetwi	12.0	18.0	30.0	41.0	11.7
Nili	13.0	26.0	39.0	57.0	17.7
Fruit					
Oranges	30.0	50.0	80.0	113.0	33.0
Tangarine				85.0	5.0
Grapes	30.0	36.0	66.0	102.0	36.0
Mangoes	30.0	31.0	61.0	116.0	35.0
Figs	30.0	34.0	64.0	119.0	55.0
Bananas	-	-	158.0	255.0	77.0

(1) Issawi, C. 'Egypt at Mid Century' Oxford Univ. Press. London 1954. page 110

Marketing:

In the Nile Delta the farmer is paid for his cotton crop usually immediately after the crop is picked in July or August. The crop may then be handled by some or all of the following: the village broker, the village merchant, the banker or spot commission agent in Minet-el-Bassal (Alexandria spot market), the broker at Minet-el-Bassal, and then the exporter.

Larger growers often consign their cotton to the ginning factory and sometimes even see it through to Alexandria. Small growers, on the other hand, either sell it to the village merchant or carry it to the local market where it is sold by auction to brokers who in their turn dispose of it to merchants or exporters with up-country agencies. The cotton is then ginned, pressed, and dispatched to Alexandria.

For grain marketing, the normal proecedure is for the grower to sell his crop to the village grader who sometimes then either deposits it in a bank 'shoona' (open store). The grain is then either sold to the village agent of one of the big city traders or sent by boat to the riverside markets of Cairo (Rod El-Farage) and Atar El-Nabi) or Alexandria. Large growers and co-operatives often short-circuit the village trader.

Vegetables are picked, washed and carried away to the town or the local market. The government can act together with co-operatives in improving the grading and packing of vegetables; providing storage refrigeration and factories for preserving and canning; facilitating the operation, and reducing the cost of marketing both at home and abroad; and above all, standardizing the different varieties and delimiting the regions most suited to each crop.

For fruits, the average output gives a per capita supply of 6 kilograms per annum, to which should be added another 3 kilograms of imported fruit. The output of fruits is carried directly to the local markets in towns and cities. The large orchards usually have their own transport facilities and are directly connected with the traders in towns where the fruits are sold by auction.

Livestock

In recent years progress has been more rapid in livestock breeding than any other branch of Egyptian agriculture. Average annual production in the selected

herd[1] is 4,500 lb. milk and over 300 lb butter fat, against a national average of 2,500 to 3,000 lb milk and 200 to 250 lbs fat per animal. The total output of milk in 1951 was one million tons; of this total 65% was buffalo milk and 35% cow milk[2]

Further progress is held up by the scarcity of green fodder in summer; by the predominant use of livestock for farm work; by the high capital investment required; and by the poverty of the market.

In 1947 the number of cows rose to 1,321,000 that of buffaloes to 1,241,000: that of sheep to 1,875,000 and that of goats to 1,476,000 and that of pigs to 50,000[3]

Poultry farming has also been well developed. In the pre-war period some 900 million eggs were laid each year, of which 50 million were exported; since then there has been an appreciable increase after the erection of several poultry stations in the Delta.

Fisheries output is low, being estimated at 60,000 tons of which 30,000 tons come from the lakes of Marout, Edku, El-Burellis and El-Manzala in the northern parts of the Delta; whilst 5,000 tons come from the Nile and the irrigations canals. At the same time the country imports about 16,000 tons as the per capita consumption is only 4 kgms.[4]

Very many of the cows and buffaloes are used for a dual purpose; work and production. The total number of cows and buffaloes in the country is about 2,562,000[5] of which 1,466,000 are used for work. According to the present needs of the cultivated land, it was found that a unit of 100 feddans need about 10 bullocks for working purposes. This means that the present total cultivated area needs only 600,000 working cattle. The excess in working livestock therefore is about 900,000 beasts all of which have to be fed from the land. This is beside the expenses of breeding.

On the other hand, there are 7,000 tractors with an average of 35. H.P. each.

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(1)
(2) Issawi, C. Egypt at Mid Century Oxford Univ. Press, London 1954.page 121
(3) Ibid page 120
(4) Council of National Production Report. Government Press, Cairo 1955
(5) Lacouture, J. & S. Egypt in Transition. Methuen, London 1958. p.309-339

according to the cultivation needs, this number of tractors can serve 500 to 1000 feddans, i.e. 35. H.P. for an area of 250 feddans. If these tractors are to replace some more beasts, the waste in livestock will be more than the estimate just given.(1)

(1) Lacouture, J. & S. 'Egypt in Transition' Methuen, London 1958 page 309 - 339.

b MECHANIZATION

The availability of cheap labour is a major contributing factor governing the economical use of power machinery on the land. Where there is an abundance of agricultural labour as in Egypt, and few other outlets for surplus farm labour, little is gained agriculturally by introducing tractors, if the arable area is at present adequately cultivated.

The capital outlay of modern farm machinery is high but it is not only the initial cost which has to be taken into account. There are fuel and lubricants repairs and spare parts, servicing and housing, actual hours of work and idle time all of which govern the economics of mechanization.

It is not unusual to conclude that even though ploughing, cultivating, seeding and harvesting can profitably be undertaken by hand and animal power, water-raising, threshing, draining and grinding should be mechanized by installing engines or electric motors on individual farms or communally.

In this view mechanization of agricultural would be more reasonable to be applied to the countryside after the industrialization of the region is developed and has taken a stabilized shape. Therefore mechanization must come in the last stage of the development plan as a natural result of industrialization.

Level of Mechanization

In Egypt the tractor fleet was estimated in 1957 to be 7,000. The arable land per tractor was about 600 to 1000 feddans while the percentage of agricultural land in holdings exceeding 30 feddans - an area which it is reasonable to use a tractor - was about 51% in 1959(1)

In the near East in general, the percentage of world tractors between 1948 and 1949 was 0.2% while that of world arable land was 6.1%. In Europe, for example, 15.0% of world tractors were in use on 12.2% of the worlds arable land. In the U.S.S.R. 9.3% of the world's tractors were in use on 18.4% of the world's arable land. In the Far East the figures were 0.2% and 22.9% respectively, while in Africa, they were 1.0% and 12.4%.(2)

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(1) Issawi, C. 'Egypt at Mid Century' Oxford Univ. Press, London 1954. page 118
(2) F.A.O. Farm Mechanization . UnN.O. Washington 1950.

In the Agrarian Reform regions, in Egypt, the following list of machinery was in use in January, 1957.(1)

106 Threshing machines - 470 tractors - 270 irrigation installations
550 mobile irrigation installations between 400 h.p. and 16 h.p.
200 cars and motorcycles - 90 motors to drive sprinklers and sprayers
In addition there were 250 water pumps driven by traction motors which are to be replaced by fixed irrigation installations.

The indigenous agriculture of the Delta depends on the use of hand tools, supplemented by animal-drawn equipment, of simple design such as the wooden plough and the 'norag' or bullock-drawn threshing machine. Local industry supplies the traditional equipment of the small farmers, but most of the improved animal-drawn implements and all tractors and associated implements are imported.

In comparing costs of mechanization and those of draft animals statistics of the Agrarian Reform Machinery Department(2) show that the cost of using cattle to thresh one ardab of wheat is 40 PT. (about 8/-) and it takes an average of 3 hours, but using machinery the cost of threshing one ardab is only 26.5 ardab P.T. and the job is done in twelve minutes.

The cost of a single ploughing, harrowing and levelling of one feddan using cattle is £E 2.52 and the work takes three days and a half. Using a 45 h.p. tractor and a nineshear plough it takes only one hour to complete a first ploughing and levelling as well as a second ploughing, levelling and harrowing, and it costs only £E 1.44.

To irrigate one feddan with a water wheel (saqiyah) takes a whole day and costs £E 1.155, but with a mechanical pump one feddan can be irrigated in one hour and it costs only 25 P.T. (@ 5.s.)

It seems that these figures are not based on the initial capital invested in each case, plus the cost of training, spare parts and maintenance in the case of using machines, and the cost of feeding, breeding and care in the case of using the ordinary draft power.

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(1) Marii. S. 'Agrarian Reform in Egypt.' Government Press Cairo 1958. page 237
(2) Ibid.

On one hand if we consider the tractor's working age to be 10 years with an overall cost of £E 4,000 this will give an annual cost of £E 400. On the other hand, if we consider that 8 draft animal units can replace one tractor, as estimated by the F.A.O.(1), we have to consider the cost of these units in the rural Delta so as to compare it with that of the tractor.

The price of the buffalo varies between £E 50 and £E 70 and sometimes £E 100. The annual expenses of a buffalo amount to about £E 30 on the average. In return the buffalo gives products of about £E 18 of milk and fat, £E 10 in calves, and £E 4 of manure. This amounts to £E 32 per year in a working period of 14 years. This means that even disregarding the buffalo's labour contribution the value of its own products almost covers its cost of maintenance.

The eight draft animal units will therefore cost about £E 800 over a period of 14 years with an average of £E 60 per year. This cost is somewhat smaller in the case when a cow is used instead of a buffalo as the cow is cheaper and lives longer.

The above comparison shows that it is cheaper to use draft-power units instead of tractors. But this does not imply abandoning the use of machinery in agriculture. On the contrary, it is essential to introduce new techniques and machinery which suits the type of agriculture in the Delta, although power from draft animals can still be used.

Limitations in the Application of Mechanization

The most pressing and vital problem of the country today is to grow more food and other agricultural products as quickly as possible. Whether mechanization of agriculture can contribute anything towards the solution of this vital problem is a subject which must receive very careful consideration.

There are two types of mechanization. The first is the mobile type which attempts to replace animal power on which the agriculture of the world has been based for very many centuries. The second involves machines designed to eliminate the drudgery of certain operations which have to be performed either by human labour or by a combined effort of human beings and animals.

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(1) F.A.O. 'Farm Mechanization' UNO 1950.

The case in the Delta is very different from that of many European or American countries. As there is a surplus of man-power, mechanization will be ineffective, not only because of the expenses which it involves, but also by reason of the additional unemployment which it would create. If the agricultural production in the Delta is to continue to depend upon small holdings and subsistence farming, it can be stated that mechanization will have no place in such a system, nor will such a system ever be capable of producing enough to satisfy the country's needs. If co-operative farming were to be adopted it would lend itself to partial mechanization of agricultural operations. In the early stages, this partial mechanization will have to be through State agencies.

Partial use of machinery would lead to efficiency, but it does not necessarily follow that this would mean fewer men upon the land. It might involve fewer men per operation but not per feddan. Partial mechanization would create several new classes of employment. Mechanization would help to establish village industries and the processing of agricultural produce will be possible within groups of villages. From the residential point of view, the co-operative farms will have collective stores, machine services, and stables which will cause a great reduction in the amount of accommodation at present attached to the individual rural house.

Under the system of rural land reorganization advocated in this thesis, mechanization, if applied, will only be used on a small scale, since it is only the landowners who possess less than 5 feddans who would be involved in the co-operative farming system which eventually will need partial mechanization. The other sections of the landowners will continue to adopt the usual implements which can be improved or modified as far as their holdings give economical farming.

c. Rural Industries

The village crafts are carried on according to ancient routine with primitive instruments. Not until very recently (1955) has there been any attempt at improving craftsmanship or at specialization. As a matter of fact many artisans ply their crafts along with agriculture and only in their spare time. Similarly many cultivators during their slack season are engaged in making baskets, matting, rugs and hand-spun cloth out of local wool or cotton and they sell these in the periodical markets in the towns or larger villages.

There are rural industries which lack organization and modernization, on both the production and the distribution sides, viz. blanket-weaving, carpets, pottery carpentry, matting and furniture from palm trees leaves.

Industries that are of an artistic nature and are run by artisian groups that have aquired hereditary skills command markets even outside the country, provided their technical methods, supply of raw materials and marketing organization are properly rationalized. (See figure 16)

There is a good variety in the types of rural industries. They differ slightly from one district to another; but the main local industries are:-

1. Cheese and butter making: the percentage of consumed liquid milk does not exceed 5%. This percentage can be 50% in villages with a big weekly market, hospital and civil servants.(1) Most cheese and butter is made at homes in the villages.

2. Egg Hatcheries: these are comparatively few as yet, but at present about 1 million chickens are being produced annually in hatcheries.(2)

3. Other industries: some of these are handicraft industries whilst others are directly related to agricultureal products. In the first group are such undertakings as basket-making, pottery and furniture making whilst the second group includes such activ-

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(1) Consumption of liquid milk is larger in towns and country towns.
(2) Council of National Production, Report Government Press, Cairo 1955

Basket-making

Tile-making

Pottery-making

Honey-making in a C. Unit

RURAL INDUSTRIES

FIG. 16

ities as hand-weaving looms for cotton, mats and carpets honey making, 'agwa' from dates, sugar-cane juice, and other products for essential needs.

The introduction of rural industries into the villages can have a good effect in offsetting unemployment, also to increasing the farmer's income and helping to raise the standard of living of the farmers, provided that - as a part-time occupation - the industries are introduced on an adequate scale and on a proper basis.

Structure of Industry

The structure of industry in the Delta indicates that about 22.2% of the industrial population are engaged in textiles, 19.6% in clothing 12.20% in wood-work and 8.7% in vegetable foods. This means that industries dependent on agricultural raw materials engaged about 63% of the industrial population in 1947. On the other hand 11 groups of industry out of the total 22 groups, together employ only 7.9% of the total industrial population(1)

In Menoufiya Province the total number engaged in secondary industries amounts to 30.062 distributed as follows:-(2)

Table 33 Distribution of Population engaged in Secondary Industries In Menoufiya

Industry	No. of people engaged	Percentage
Textiles	9,890	33.0%
Clothing	4,169	12.7%
Wood-work	2,822	9.4%
Vegetable Foods	1,531	5.1%
Power & Public Services	1,654	5.5%
Metal Articles	2,437	8.1%
Machine & Machine Tools	508	1.7%
Transport Equipment	878	2.9%
Preparation of Metals	453	1.5%

/ Cont over

(1) General Census 1947
(2) Menoufiya, General Census 1947.

Industry	No. of people engaged	Percentage
Materials of Construction	847	2.8%
Printing	64	0.5%
Leather and Fur	158	0.5%
Scientific Instruments	160	0.5%
Tobacco	295	1.0%
Chemicals	123	0.4%
Drinks	350	1.2%

(1)

Distribution of Rural Industries

The distribution of rural industries does not vary much from one district to another, except in the case of some villages which are famous for one or two kinds of industry, even when they maintain other types of industries as well. In this case inherited artisan tradition plays a main part as well as the presence of adequate raw materials and marketing facilities. Examples of these are Kafre El-Hosrs (for matting) in the Province of Sharqiya, Fuwa (for blankets) and carpets) in the Province of El-Gharbiya, El-Kuren (for 'agwa' dates) in Sharqiya, Damietta (for dairy products) and Qaha (for food canning) in the province of El-Qalubiya.

Most of the big villages comprise the above mentioned rural industries as the village economy tends to be self sufficient.

A plan of development has been initiated by the State to set up Model Industrial Establishments in those centres where the possibilities are greatest for turning out high grade artistic products which could capture a wide market. The Government has already made considerable strides in this sphere, to reorganise and develop rural industries and cottage crafts.

The objects which these establishments are to fulfil are:

1. Training and demonstration among the farmers of improved implements, machinery and methods

(1)

2. The introduction of new and improved designs and planning of production according to the demands and tastes of consumers

3. Cheap supply of raw materials t the artisans

4. Organization of marketing.

These developments are likely to have marked sociabogical repercussions both on the individual and on village community structure and will tend to stimulate population movements both internally and externally. The process of rural industrialization will give rise to a transition period in the nation's life as it changes a purely agricultural country to one based on an agro-industrial economy. The fellah has for a long time, lived in his village and become an integral part of it. He never thought of leaving his village whatever the circumstances were. He is part of the village environment, its character, its habits, its food, and even its mud. Rural industrialization will help to break down this age-old tie between man and land in the Egyptian countryside.