

Egyptian Agriculture and the start of the Green Revolution

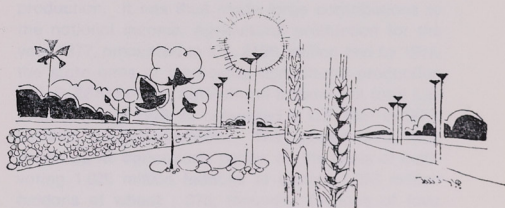
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Foreword :

The agricultural sector occupies an important position within the Egyptian Economic structure ; by achieving great averages in agricultural and Animal production, it has thus made large contributions to the national income. Agricultural production for the year 1977, amounted to L.E. 2196, million and by 1978, the state aims at increasing agricultural production to L.E. 2270 million. Agricultural income will total L.E. 1662 million in 1978, as compared to L.E. 1591 in 1977, i.e. with a 4.04% increase. The government, has drawn up its agricultural policy, on the basis of cultivating 1.025 million feddans of cotton, 1.253 million feddans of wheat ; 378, thousand feddans of fava beans ; 83 thousand feddans of lentils ; 1063, thou-

sand feddans of vegetables ; 269, thousand feddans of sugar cane ; 15.8 thousand feddans of Beet sugar thereby achieving self sufficiency in sugar consumption for the first time, and moving on to the exportation phase ; 63, thousand feddans of flax ; 1.190, million feddans of rice ; 1.670 million feddans of millet ; 510 thousand feddans of maize and 85, thousand feddans of soya beans. Simultaneously, measures have been taken to put a stop to the exploitation of agricultural areas, for construction and new expansion ; or diggings for the brick industry, which result in damaging the agricultural areas and lead to loss of fertility. In addition there have been guidance operations in pest control, mechanization of agriculture and in the expansion of the new land reclamation areas. In the field of Animal production, it is anticipated that production of poultry in 1978, will surpass, 70 million chicken, and the production of eggs will amount to 160 million eggs, that is together with encouraging both sectors, the private and the cooperative, for breeding and fattening livestock for the production of milk and meat, as well as increasing the production of fodder, finding new sources for its constituents and solving problems of distribution. The production of fish for 1978 will increase by 10.800 tons more than 1977. The Agricultural sector, strives hard to achieve the green revolution, whose first signals were given by President Sadat, for the realization of food security for this generation, and for those to come.

Agricultural Development

The 1976 — 1980, five year agricultural development plan, aims at increasing efficiency in the production of employed agricultural resources to the maximum extent possible, and raising the efficiency of the agricultural organizations and institutions to achieve an increase in production and in agricultural national income.

Vertical Development :

Vertical Development aims at increasing production efficiency, and obtaining the highest production possible from the areas cultivated through modern scientific methods of cultivation to ameliorate the quantity and quality of the crop and its abundance, and the mechanization of agriculture, specifically the implements of ploughing and irrigation.

Features of the Vertical Development plan

The vertical development plan, is based upon achieving the following trends :

- Consolidating and diffusing agricultural extension plans, throughout the entire republic, with the purpose, of acquainting the farmers with the results of the new researches, and solving their problems at the research centres. Hence agricultural extension, becomes the channel leading to agricultural development, and solving the problems that impede the realization of this evolution.

- Organizing agricultural research studies and by supporting and developing them to comprise studies that can be of benefit to farmers
- Developing agricultural techniques in keeping with our local circumstances at agricultural research centres.
- Expansion in agricultural mechanization and in its employment, specifically the ploughing, draining, threshing, reaping, and tractor machines, for the purpose of increasing production and minimizing costs ; of ameliorating the soil and protecting the animals and saving them for the production of dairy products and meat.
- Ameliorating agricultural crops by cultivating them in the most suitable areas for production, to obtain the maximum yield possible ; that is together with discovering new kinds of crops distinguished by their quality and the quantity of their yield, and their resistance to disease and pests.
- Meeting all local consumption need for various agricultural crops, and realizing a reasonable surplus for exportation of cotton, rice, peanuts, vegetables and fruits.

The State aims at raising the self-sufficiency rate of agricultural crops by 1980, as follows :

Crop	1975	1980
Wheat	43%	48%
Corn	80%	87%
Fava Beans	70%	89%
Lentils	70%	88%
Sesame	31%	61%
Sugar	79%	84%
Oil	33%	46%

Methods for Increasing Agricultural production

Increasing Agricultural production has become a national goal, to which the various organs of the State work to realize more food for all the people. There are several methods for increasing the crop produce of the feddan, and they are developed and strengthened so as to serve their purpose. Most important of these methods are :

1. Projects of soil improvement :

Farming soil in Egypt, has been exposed to several problems, due to the condition of drought prevalent here ; as well as the system of perennial irrigation ; dense, uninterrupted cultivation, extravagant

usage of irrigation waters, and the non-existence of drainage projects during these long previous years, which consequently resulted in increased soil salinity as well as the increase in the level of ground water thereby affecting its production capacity. It was therefore imperative that a project for soil improvement should begin, by constructing a network of open drainage systems, and adding agricultural gypsum to remedy the alkaline surface levels, to improve its structure and to purify it of harmful salts.

The assessment undertaken has denoted, that this project applied over an area of 300, thousand feddans has resulted in raising the agricultural production of this area by 30% to 50%. the 1976 — 1980, five year plan, comprised the implementation of these projects over an area of 1.10 million feddans.

2. Open and Tiled Drainage

The open and tiled drainage systems are considered the corner stones of vertical agricultural development in Egypt. It is the largest and most economic of production projects in the agriculture and irrigation sector, after the High Dam. Reasons for the success of the tiled drainage projects are due to the presence of good and deep open drainage for the farming areas assigned for covered drainage systems. Projects of open and tiled drainage that have been implemented are as follows :

In 1975, open drainage networks were set up over an area of 480, thousand feddans ; and a tiled draina-

ge network over an area of 125, thousand feddans was established. Simultaneously, three new drainage plants were inaugurated and began operating, two in the Guiza governorate and one in the Gharbia governorate, serving an area of 132, thousand feddans. In 1976, the following operations were carried out:

A) Implementing the open drainage network over an area of 330.630 feddans distributed as follows:

Eastern Delta Region	38.800 feddans
Central Delta Region	75.000 »
Western Delta Region	85.880 »
Central Egypt Region	66.700 »
Upper Egypt Region	64.150 »

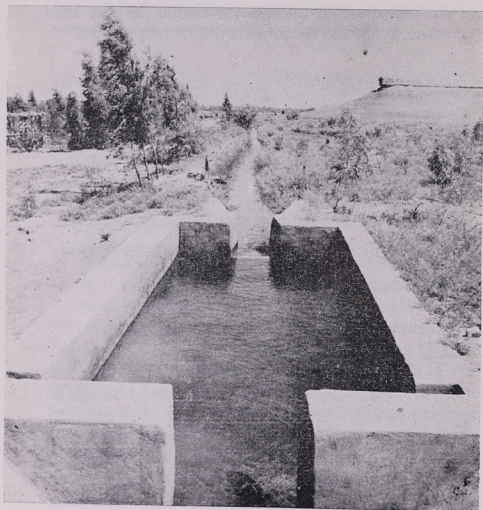
B) Implementing the tiled drainage network over an area of 190.325 feddans distributed as follows :

Eastern Delta Region	59.000 Feddans
Central Delta Region	38.000 »
Western Delta Region	45.000 »
Central Egypt Region	18.235 »
Upper Egypt Region	30.090 »

Two new factories for producing tiled drainage pipes, have been inaugurated and put into operation, one in Tanta and the other in Damanhur, and a third is under construction in Aga, thus the production of these factories will meet the needs of lower Egypt.. Production capacity of these factories, on operation,

in two shifts will amount to 12, million metres of pipelines, sufficient to provide 150, thousand feddans with tiled drainage networks.

Three new drainage plants have also been put into operation, in lower Egypt to serve an area estimated



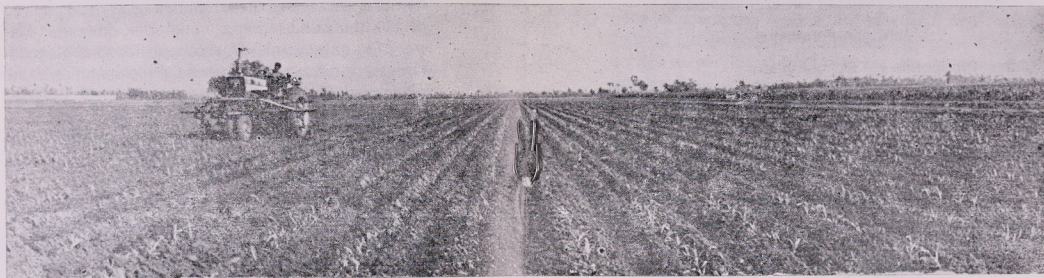
Canals, channels and drainage

at 269, thousand feddans. In 1975, the implementation of a network of tiled drainage comprised an area of 150, thousand feddans, and open drainage networks to an area of 180, thousand feddans. Simultaneously, drainage plants whose implementation or renovation were underway, were completed, as were the housing establishments and the High voltage electric power of these plants which numbered 15, stations in Lower Egypt serving an area of 808, thousand feddans. 13 stations in Upper Egypt, serving an area of 635, thousand feddans. That is alongside with expansion in the maintenance projects of the tiled drainage network which was implemented in 1975, and has been reinforced with personnel and equipment.

The experiments and studies that have been made, indicate that the network of tiled drainage, raises agricultural production by at least 30% in the various crops ; and these projects are considered an investment and make a profit equivalent to vertical expansion of one-third of the area presently cultivated in Egypt.

3. Fertilizers :

Fertilizers of all types also constitute one of the important methods of increasing agricultural production, thus the State works to provide sufficient chemical fertilizers for farming. Egypt has known the use of chemical fertilizers since 1902. The first fertilizers to be used were Sodium Nitrates, then development



Modern agriculture for promotion of production

in the usage of fertilizers led to the employment of other types of fertilizers. All the fertilizers that were required, were imported from abroad, until the first production of Egyptian fertilizers appeared in 1936 ... The production of fertilizers is confined to two major types : — Nitrogen fertilizers and phosphate fertilizers, as for potassium fertilizers, due to the lack of production materials, no industry has been established for it.

The Ministry of Agriculture has increased the fertilizers subsidy this year to L.E. 16.5 million in order

to meet the needs of the farmers, considering the increase in the price of raw phosphates, and the increase of nitrogen fertilizer imports, by 3% and the import of phosphate fertilizers for the first time.

The estimated need for Nitrogen fertilizers in 1978, is approximately 1 million 555, thousand tons, and the expected production is 1 million 330, thousand tons. The estimated need for Phosphate fertilizers is 690 thousand tons, while production is estimated at 642, thousand tons, i.e. showing a 6.5% deficit.

Egypt's Production and Consumption of fertilizers
(In thousands of tons of fertilizer elements)

Nitrogen Fertilizers		
Year	Production	Consumption
1974	100.550	360.000
1975	124.700	405.000
1976	160.300	408.200
1977	206.103	—

Phosphate Fertilizers	
Production	Consumption
396.000	515.000
77.700	80.000
74.000	86.000
94.500	—

Potassium Fertilizers	
Prod.	Consumption
—	31.300
—	32.200
—	33.600
—	—

Anticipated Production of Fertilizers from 1978 to 1982.

Year	Nitrogen Fertilizers	Phosphate Fertilizers
1978	329,088.	103,500
1979	587,608.	103,500
1980	648,068.	103,500
1981	731,668.	148,500
1982	731,668.	157,500

4. Agricultural Research :

The application of the Agricultural plan depends upon encouraging agricultural research, and achieving an integration and co ordination between them, as well as benefiting from their results, and providing precise and elaborate economic data and statistics, which will consequently lead to solving the problems, specifically practical, urgent farming problems, as well as providing new methods and ways for more efficient production.

The implementation of the research, and its supervision, is undertaken by the Agricultural Research centre; this centre draws up an integral plan for scientific research, that is linked to the agricultural development plan, and undertakes the study of the major problems of production, and finding suitable

solutions thereof for example : — studies were made concerning the scarcity of Nile alluvium at present—after its blockage behind the high Dam, and attempts at finding alternatives to that.

There are thirteen assistant professors in a section affiliated to the Agricultural Research Centre. The estimated number of members at the Research Organization is about 702 members, plus 5,537 assistants. The government is reinforcing research units and supplying them with experimental fields.

5. Pest Control :

The agricultural policy aims at developing the use of pesticides, and the employment of the most efficient and modern kinds.

The Ministry of Agriculture has embarked upon a new development, and a national method in the control of pests, pursuing a scientific technique, based upon the following aims:

- Giving the utmost attention to manual picking of the cotton boll worm.
- Making sure that clover is not irrigated after May 10th.
- Precision in the choice of pesticides, and the necessity of running a series of experiments on them to confirm their success and efficiency.
- Providing pesticides to confront all possibilities, and distribution on all the governorates at the right time.
- Limiting the use of insecticides.
- Biological resistance, by maintaining parasites, that eliminate pests.
- Preparing the appropriate land resistance equipment, in sufficient numbers, and at the right time.
- Dependence upon agricultural aviation is to control cotton-pests, and carry out spraying.

Horizontal Development:

This is the second part of the agricultural development plan and of no less importance than the vertical development. It aims at increasing the cultivated areas by annexing new terrains via the employment of modern machinery and the heavy equipment ne-

cessary for the levelling operations, land reclamation, road paving and, canal digging, so that every inch suitable for farming can be cultivated.

Features of the Horizontal Development Plan:

The importance of agricultural development lies in the fact that horizontal development permits expanding the base of agricultural investments, increasing agricultural production and diversifying it, as well as creating a balance between agricultural and human resources. A plan for agricultural horizontal development has been drawn up, by utilizing the amounts of water afforded, whether river water or subterranean water in the Nile Valley.

Upon these bases, comprehensive studies for present expansion were made, for an area of 2.5 million feddans, plus half a million feddans irrigated by subterranean water, and rainfall outside the Nile Valley. Approximately 450, thousand feddans were chosen for reclamation, during the years 1978, 1979, 1980, these areas are spread over various governorates and methods of reclamation and utilization differ.



As regards geographic locations of these area — they are as follows :

Sinai and East of the Canal	— 10.000	feddans.
East of the Delta	— 157.800	»
Central Delta	— 42.400	»
West Delta	— 135.800	»
Central Egypt	— 21.500	»
Upper Egypt	— 39.800	»
New Valley	— 45.000	»
Total	450.000	feddans.

Annual implementation of the reclamation operations are as follows:

In 1978 annexed to the cultivated area	100.000	feddans
1979 annexed to the cultivated area	153.000	»
1980 annexed to the cultivated area	197.000	»

National, Arab and foreign capital will participate alongside with the investments allocated by the State in the following manner:

Year	Individuals	Land Reclamation by		State Organs.	Total in thousands of
		Co operatives	National + Joint		
1978	27	20	40	13	100
1979	12	59	62	20	153
1980	11	76	78	32	197
Total in thousands of	50	155	180	65	450
					Feddans

In addition the State also undertakes the reclamation of 25% of the areas allotted to the cooperatives and the joint companies, in return for allotting these areas to small farmers.

For this breakthrough in horizontal agricultural development based on sound, scientific national, and objective study within the framework of the great aims, it was inevitable that a radical change take place in the methods of land reclamation and restoration.

The state could not possibly undertake and finance it alone, and upon this basis, the national agricultural companies could perform their duties in agricultural expansion, and allow the participation of local and foreign capital to establish joint projects for intensive agricultural production, together with the participation of individual efforts, as well as encouraging cooperatives to reclaim those areas, difficult to annex to the cultivated areas by individual efforts alone.

The public sector companies, and the state organs, undertake the responsibility of reclamation and restorations of land, in the projects that require large structural installations.

Future Projects

The State plan comprises, the start of reclaiming some of the areas of the long range projects. Out of about 22 million feddans which have previously been

checked and studied, 4.25 million feddans have been chosen. These areas are spread throughout all regions of the republic, as follows :

Sinai and East of the Canal	735.000	feddans
East of the Delta	813.500	»
Central Delta	168.400	»
Northern Shores to the West	144.000	»
West of the Delta	231.000	»
Central Egypt	124.700	»
Upper Egypt	158.500	»
Kattare Depression & Siwa	220.800	»
New Valley	1425.000	»
On the shores of Lake Nasser	200.800	»

Important long Range Projects

1 — Southern Project of the New Valley

Studies have indicated the existence of approximately 3 million feddans suitable for cultivation of large collective areas, that can be irrigated together via digging, a canal for transporting the water from Lake Nasser, in addition to the subterranean water present in the region. It is aimed to reclaim an area of 45, thousand feddans in the short range project period.

2 — Project for the Southern Port Said Plain:

This lies west of the Suez Canal from Ismailia to Port Said, and the clay and saline clay areas amount

to approximately 350, thousand feddans, the remaining areas, being of sand terrain. This project is intended to be irrigated from the Ismailia canal, after its expansion. Draining will be affected by elevating the water to Lake Manzalla. These areas are comprised within this proposed areas where agriculture machinery will be employed, and their economic development will be integrated by introducing animal production, and agricultural industries.

An area of 40 thousand feddans will be reclaimed within the years 1976 — 1980.

Project of the West Nubaria:

The total area of the Project amounts to approximately 300, thousand feddans. Work was begun during the second five — year plan, and approximately 40, thousand feddans, have been reclaimed. The project is intended to be irrigated by the Nubaria canal. This project also falls within the big projects where agricultural mechanization is intended to be employed.

An area of 102 thousand feddans will be reclaimed within the 1976 — 1980, plan years.

— Sinai Projects:

The Policy of the Ministry in this region aims at starting to reclaim 30, thousand feddans in the Eastern Suez Canal region. This project is irrigated at present by a junction from the Suez Canal, beginning with 10 thousand feddans, within the 1976 — 1980 period.

Investments of the Agricultural plan in 1978

The total investments allowed by the plan for 1978 for the agricultural and irrigation sector, amounted to approximately L.E. 187.1 million, of which L.E. 15 million go to the private sector, i.e. with an average increase of 37.6% from the investments of the 1977 plan.

The project for 1978, has given great attention to the advancement of agricultural production in the old and the new areas. As regards vertical expansion investments worth L.E. 8 million have been directed to raise the level of plant production, the increase of agricultural productivity from grains, and herb crops and the discovery of new types, as well as reinforcing agricultural research centres, immunizing animal and plant wealth and developing the mechanization of cultivation operations. The plan also gave attention to removing the impediments to production, and raising the efficiency level of the workers, together with solving the problem of the salinity, and decay of the soil, where to this purpose approximately, L.E. 4 million were allotted for the amelioration and maintenance of weak soil areas.

The plan gave special attention to the increase of animal and chicken production, by allotting investments worth approximately L.E. 6 million, for projects that aim at realizing a production of meat of about 9 thousand tons, and a dairy production of approximately 13 thousand tons. It has also designated investments worth L.E. 6 million for advancing fish wealth.

As regards horizontal expansion, the plan aims at giving a forceful impetus to the completion of cul-

tivation operations of reclaimed areas, and has allotted to this end investments, totalling L.E. 20 million.

— The plan, also gave attention to the amelioration of open and tiled drainage systems, and has specified approximately L.E. 47 million, for the completion of the pumping drainage stations which are underway, as well as deepening, and expanding the public and auxiliary drainage, and to this end, approximately L.E. 2 million have been allotted, for controlling weeds in the water sewers and for raising the efficiency level of the drainage network. Approximately L.E. 12 million, have been allotted to complete the major irrigation and drainage sewers of the expanded farmed areas.

— The plan comprises investments worth approximately L.E. 10 million, for the completion of reclamation and reconstruction of an area of 60, thousand feddans previously reclaimed and intended to be supplied by important, vital installations, together with specifying approximately L.E. 9 million, for starting the reclamation of about 40, thousand new feddans.

— The plan aims at developing the crop composition in 1978, increasing exports, and realizing self-sufficiency of some crops, specifically herbaceous crops, and that is by expansion in fava, lentil, and sesame areas... together with introducing new crops within the cultivation cycle, as beet — sugar, oil — seeds, and the expansion of fava — bean areas, of vegetables and fruits and increasing productivity.

— The plan has also paid attention to developing the meat, chicken and egg production to meet local consumption needs.