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SUPPLY OF AGRICULTURAL MACHINES IN EGYPT
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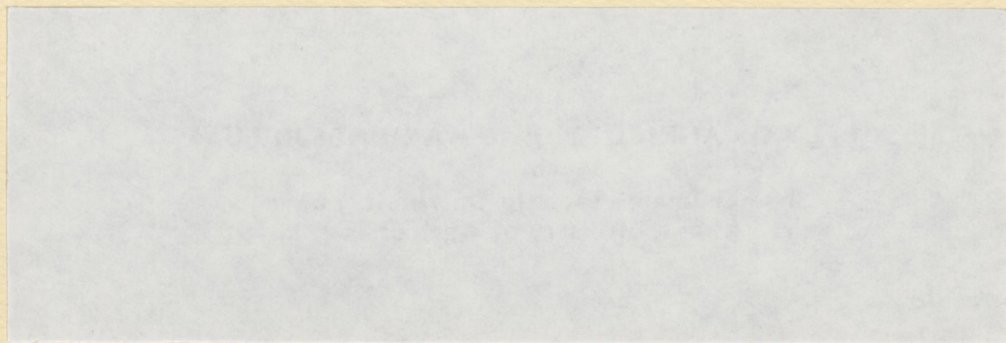
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SUPPLY OF AGRICULTURAL MACHINES IN EGYPT

by

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SUPPLY OF AGRICULTURAL MACHINES IN EGYPT

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Introduction

Mechanization of agricultural operations depends upon the availability of machines, implements and very cheap services. The most recent data indicate that the total population of agricultural machines includes 54539 tractors, 21799 fixed pumps, 59281 mobile pumps and 8184 threshers. All of them are distributed among the public, cooperative and private sectors. The main sources of agricultural machines are local manufacture, assembly and imports.

However, mechanization efficiency depends on the availability of repair and maintenance services.

To explore some issues related to supply of agricultural machines, the empirical study dealt with machine ownership on the village level in the old and new lands, repair and maintenance workshops at the different levels; agents which deal with machines and spare parts at both district and governorate levels, and plants manufacturing and assembling agricultural machines in the private and public sectors.

Supply of machines at the village level

In the old lands, the main sources for supplying machines are the private sector and the cooperative associations. Each of them has some specific features related to types of machines, kinds of problems and methods of dealing with farmers.

Private machine ownership: Because tractors represent large capital items, some means for grouping the resources of several individuals is usually necessary for tractor purchases. Very frequently this grouping takes place along family lines. From the survey conducted in Menia, Assyut, Sharkia and Gharbia, four main forms were noted:

1-owners of agricultural machines using their machines on their farms only. All the owners of tractors in this category hold 10

feddans or more. While the owners of pumps and threshers hold less than ten feddans or more. The reasons that prevent renting machines, specially pumps are the shortage of water and need to irrigate in the proper time. The employment used in managing machines is mostly hired labor. The owners usually buy machines in cash. They own very diversified types of tractors that differ in horse power, fuel, etc. All the tractors, in the private sector, were found usable. The problems of repair and maintenance tractors are simple breakdowns which the driver can solve them himself, medium breakdowns which need mechanic from the workshop and big breakdowns ; including overhauling, which need to be repaired in the workshop at the district or in the capital of the governorate.

With respect to pumps , there are two kinds fixed and mobile. Fixed pumps may be traditional or electric. The latter possessed by big farmers only. The single farmer may use more than one mobile pump. It has been proved that farmers in lower Egypt prefer small , light pumps with around 5 - 8 hp. as far farmers in upper Egypt they prefer big pumps , like diesel - Shubra- 11hp.-14hp, Deutz 11hp, 16hp. Some pumps are new , the others are 15-20 years old. All pumps are still in use .

The owners possess other machines, the most important of which are hoes, threshers and pesticides sprayers. Hoes are only owned by big farmers who cultivate citrus and fruits. The most popular model of these hoes is Japanese Mitsubishi 11hp whose price is estimated at 1600-2000 LE and its capacity amounts to 1- 1.5 feddan a day. Hoes with trailer are used for transporting fertilizers and crops to and fro warehouses. The type which is commonly used is made in China with one ton cargo. It is practical enough in case of citrus and fruit trees because of its low height. All threshers are locally made , they are used for threshing winter crops like wheat, barley and beans. Their main problem lies in the necessity of changing their cutters once a year. Big farmers have various types of pesticides sprayers which can be easily repaired in nearby workshops.

The problems confronting the first group are:

- Machines' prices are very high.
- Prices of spare parts are very high.
- Shortages of spare parts.
- The monopoly of spare parts practised by some agents to force the owners to perform the repairs in their workshops.
- The specifications of local manufactured spare parts are bad.

2-The second group are owners who use their machines and rent them to others. They represent most of the owners. Their holdings do not exceed more than ten feddans. They consider the machine as a source of income. The family labor forms most of the employment engaged in agriculture, the rest, in few cases, consists of hired labor. Several private groups of two to four persons had been formed with equal shares for tractor or pump purchase and mutual use. Most of the machines are bought in installements as for the first group the machines are purchased in cash. There are many types of tractors in this category, most of them are of 60-65 hp, as for pumps they are mobile ones and the most commonly used are Kerloskar and Ausha, the Russian and Indian types. The owners in this category do not possess threshers, sprayers or hoes, they prefer to hire these tools from the cooperative "gam'ya" or other owners.

3-The third category includes non-farmer owners who let their machines for the agricultural purposes. No observations were found in this category, the reason of that is simply all the machine owners hold land even of very small size.

4- The owners in the fourth class rent their machines mainly for non agricultural purposes. This phenomenon is widespread in El-Dalgamon -Gharbiya for example. There are 19 bricks factories, in the sample, in which tractors are used to transport raw materials needed for bricks with long term contracts. The owners of factories may have land holdings, hence they seize this opportunity to obtain tractors to use them in their factories and to benefit of any facilities or subsidies to the tractors.

The agricultural cooperatives, the second source of machines on the village level, offer machine services with low price than its real cost. They rent tractors for land preparation or other uses, mobile pumps, threshers and sprayers. The main problems of the cooperatives are:

- neither driver or mechanic had much technical experience, so repair cost and time wasted during tractor breakdown were usually great.
- The higher administration had to be contacted when any expenditure - large or small- had to be made.
- Tractors often used for transportation, thus delay the tractor service for agricultural operations.

-The system of serving fields causing extensive travel by the tractor, consuming more fuel and oil and exhausting the tractor.
-For the above mentioned reasons and others, the tractor is usually cash deficit.

At the cooperative association of El-Daigamon, there are two tractors of 50 hp purchased in 1964. They do not used for agricultural operations. They only used for transporting pesticides sprayers for 4LE for each unit. If we compare the revenue and the costs of 1981, we reach the followings:

The net revenue for the first tractor, in eight months, was 807 L.E. In the remainder four months the net loss was 227 L.E. Thus the net revenue in 1981 was 580 L.E.

As for the second tractor, the net revenue in eight months was 821 L.E and the net loss in the remainder four months was 673 L.E, hence the net revenue in 1981 was 148 L.E.

At the cooperative association of Shembara - Sharkia, there is one tractor of 65 hp (NASR). In 1981 the total revenue in six months was 480 L.E while the total cost was 515 L.E, the net revenue was -35 L.E (loss). The problems that faced that cooperative were: The driver went abroad, the tractor was out of work during November and December, the front tires were exhausted and the spare parts were not available.

It must be mentioned that there is no integrated system for operating, repair and maintenance on the village level in the old lands.

In the new lands the study surveyed El-Salhia project. The project is located west Ismaïlia, 40 km north the canal of Ismaïlia. The area of the project, in the first stage, is 23000 feddans. Sources of irrigation water are underground water and Ismaïlia canal. Methods of irrigation are sprinkling, dripping and pivot irrigation. The project is equipped by the necessary infrastructure.

Full mechanization of all agricultural operations is one of the bases of the project, therefore the project has a special unit, the engineering administration, which includes three departments; the first for agricultural machines and tractors, the second for central workshops which perform repairs, overhauling and manufacture spare parts, the third for maintenance

workshops which perform maintenance and simple repairs in the field.

Regarding skilled labor, drivers and mechanics, the Arab Contractors has a training institute from which the project can benefit.

The specialized administrations insure the integrated system for supply and use agricultural machines. The requirement department makes assessments of required tractors, implements and spare parts and purchases them directly from the producers especially Deutz company.

On the other hand, the project, through the Arab Company For Assembly And Manufacture Construction Implements, designs implements suitable to the area, soil, irrigation water and crops. The company manufactures most of the pivot system and provides the implements with control devices that determine speed and time. The locally manufactured pivot costs 25% less than the imported one.

The data indicate that the rates of electricity consumed by the pivots in summer are 0.015 kw / cubic meter of water in June and 0.019 kw / cubic meter of water in July. These rates are considered low compared by surface irrigation. Costs of ploughing are L.E2.4/feddan by disc ploughs and L.E9.4/feddan by moldboard ploughs. Cost of leveling is L.E4.55/feddan.

Repair and maintenance workshops

The workshops concentrate mainly in the big towns, even though there are new workshops on the village level. They are equipped with modest facilities for repair agricultural machines. This trend is considered an important tendency to do quick repairs in the village i.e in the field. Introducing workshops in the village has some social effects and economic effects as well. There are two kinds of workshops in the village, the first is repair workshops which deal with simple breakdowns. The customers of these workshops are the owners who have no experience and who do not have license for their tractors. The second are lathe workshops which forming specific spare parts.

With respect to workshops in the big towns, the survey included 27 workshops in private and public sectors distributed

among 5 governorates (Behera, Dakahlia, Sharkia, Gharbia, Menia). Workshops mostly are specialized in specific kinds of machines.

Workshops specialized in mobile pumps sell and/or repair different types of pumps. The most common types are Japanese , Egyptian, Indian, French and Russian.

According to ease of transportation, the Japanese types come first, then the Indians, and the Egyptians come the last. For that reason , the farmers prefer the Japanese pumps.

The Egyptian types are the German pumps-Deutz which are assembled by Diesel Shobra factory. The factory produces two kinds, the first is 11hp and its price is L.E1100. The second is 16 hp and its price is L.E1400. The two kinds spread in upper Egypt , especially in the big holdings. The farmers need them for lifting water. They are powerful than Indians and Japanese pumps which spread in lower Egypt.

The study indicates that in spite of the efficient work in the factory , the products have some defects owing to finishing operations, not to substantial faults in the type itself. This situation calls for necessity of production control.

Each type of machines has its problems in getting spare parts. The Indians pumps have the same system, accordingly the spare parts could be used for different types. It must be mentioned that the Indians pumps are English types originally.

The high prices of spare parts represent the most important problems facing the Japanese types.

With respect to the Egyptian pumps , Diesel Shobra factory manufactures all spare parts for 11hp, 16hp, 6hp and 5hp pumps. Accordingly, a decision has been taken prohibiting imports of motors less than 7hp, but the factory could not produce all the requirements. For that reason, the government allowed importation of motors less than 7hp with one condition, that is , the importer has to purchase the same number of pumps-Diesel Shobra - 11hp, 16hp.

The most important part which produced locally for pumps is the " pulling pump". The reason for that is not shortage imports but efficiency of local products. They are designed to overcome the problems with dirty water in canals. The pump is one part not two as the imported pump, with design permits water to pass without obstruction. Two workshops in Behera produce about 90% from the domestic requirements.

The other domestic products for pumps are pistons and jets. The factory is efficient but its production is small, hence the Import Rationale Committee stopped imports of pistons and jets as a protection policy for domestic production.

With respect to tractors, there are many workshops specialized in repair and maintenance tractors. The majority of workshops belong to the private sector, few belong to the public sector (Delta Motors, Ploughs and Engineering Company). Governmental workshops are not specialized in any type of machines.

Workshops in public sector repair tractors and they do not manufacture any spare parts.

Tractor owners prefer to deal with private workshops, as they think that work runs without constraints.

Agents for selling machines and spare parts

The study surveyed 40 agents for selling machines and spare parts. Some agents sell specific types of machines, the other are not specialized, they usually sell one type of tractors and different types of other machines. On the other hand there are agents represent certain domestic or foreign companies, while the other are independent, they do not represent any company.

Some agents sell machines and carry out repair and maintenance by different ways as follows:

- 1- Agents have cars and mechanics for quick services.
- 2- Agents cooperate with specialized workshops.
- 3- Agents perform maintenance especially for local pumps (5, 6hp), like Elyamany in Damanhur and Elmogy in Mansora.
- 4- A. Megahid agent has three experts from Czechoslovakia staying at Cairo for solving problems and observing production.
- 5- Agents have their own workshops, Delta Motors agent in Sharkia has workshops for repair and maintenance. It is the representative for NASCO, F. Ragab, and the General Company For Engineering works.

The main problems facing agents are:

- 1- Shortage of imported spare parts due to limitations, delays and the exchange rate.
- 2- The national banks abstain to finance machine imports.
- 3- The foreign banks finance machine imports with high interest rates, thus minimizes the profit determining by the law 119.

5-Some people resort to add any locally produced part to the imported machine , so they can sell it by any price . In that case it considered, according to the law 119, local product.

Local production and assembly

The big plants in Egypt have the capacity for manufacture some machines ,like tractors,pumps, threshers and winnowers, with higher percentage of locally made components. All types of commonly used farm implements such as chisel ploughs and trailers are made domestically, mainly by small shops producing a few units a year.Plants are little more than bigger workshops and they have no production line .The work is performed on a piece-meal basis by either single individuals or by small group of workers.

The major producers of commonly used farm implements are:
Chisel ploughs: Behera co.-Tanta motor co.-Fahim Ragab co. - El-Mansora co. and small workshops throught the country.

Drum threshers: Behera co. , Tanta Motor co. ,El-Mansora co. and small workshops.

Trailers:Behera co. , Tanta Motor co., El-Sheity co. , Sisman co., Sallam co., NASCO,NICAR.

Irrigation pumps:Helwan diesel cp.(military factory no.909), Shobra diesel co., Tanta Motor co.

Most manufacturers of agricultural implements do lack complete heat treatment facilities,iron and steel castings and forgings. Hence they depend upon other factories for supplying such services. There are many plants providing these services like Helwan iron foundries(M.F9),El-Maadi co.(M.F54), Helwan engineering industries(M.F99), El-Nasr forging co. and Delta steel co.

Plants in the public sector:

1-Behera company: The plant accounts 80 percent of total production of farm implements. The facilities in the plant include iron-casting foundry, steel-casting foundry, forge shop, welding, machining, wood- working shop,moulding-shop,assembly, painting and testing.

The plant produces chisel ploughs both trailed and tractor-mounted of 7 and 9 tines with tines produced at El-Nasr Forging company at Helwan or imported 'from Soviet Union'.It also produces ditchers,ridgers and mould-board ploughs using plough

shares imported from East Germany, heavy ploughs, sub-soilers and four tine chisel ploughs for deep ploughing in land preparation for cotton and sugar cane, land levellers in 3,6, 10 and 14 feet widths, tractor trailed with the hydraulic grade lifting mechanism, automatically operated but pressurized from the tractor hydraulic system, belt-driven drum threshers, and a few IRRI type thresher-winnowers with a built-in diesel engine, and 4-ton 4-wheel trailers.

The selling system in the company is as follows:

- The selling prices are stated to include a ten percent profit.
- A certain number of each implement is maintained in stock for immediate delivery and as products are sold, the stock is refilled.
- No dealers are employed and the implements are sold to end users at the plant for cash.
- The plant maintains no service organization.
- In case of a breakdown, the plant send a service technician to repair the implement.
- The service is free during the guarantee period of six months.
- After the guarantee period expires, the purchaser has to pay for all repair costs.

The main problems of the plant are:

- Most of the machines are nearly 10 years old and some are even older.
- Some lathes are activated by a belt from an overhead revolving shaft rather than by motors.
- The shop for making moulds is rather primitive and requires new equipment.

2-Helwan and Shobra Diesel Company:The two plants are under the same management and largely share technical expertise. In both plants diesel engines are machined and assembled employing local materials.

At Helwan plant, The diesel engines manufactured are of two types 11-120hp(1-6cylinders) and 30-150hp(2-6cylinders). Forgings, castings and crank cases are supplied from other factories, while fuel injection pumps and electrical equipment are imported.

At Shobra plant, Three Deutz-licensed type diesel engines are produced with about 6, 10 and 16hp. All components except the injection pump and electrical equipment are locally made. All machining, heat treatment and assembly are carried out within the plant. The engines are horizontal stroke, specifically designed

Plants in the private sector:

1-Tanta Motor company: The plant engaged in production and a assembly of various implements like chisel ploughs (7 and 9 tines), threshers(drum type-belt driven),trailers(2 and 4-wheel),maize mill and irrigation pumps.It also imports tractors(David Brown,Mitsubishi 1300 15hp) and power tillers (Mitsubishi 7hp and 13hp). The machine shop is rather premetive , containing about a dozen essential lathes and machines .

2-Sallam Plant:The plant engages in production of a variety of implements including chisel ploughs,drum threshers and trailers. All work is done on contract and no stock of finished items is kept. The shop is equiped with lathes, griders,electric and acetelene wejding and other essential equipment needed for production. The plant lacks good distribution channels. Trailers produced by the plant are sold through the General Engineering Company and Ploughs or through Saad El-Aguizy.

