PN-ABQ-692

Egypt Fertilizer Policy Impact Study

Final Report

Presented By

International Fertilizer Development Center
Muscle Shoals, Alabama, U.S.A.

For

The Government of the Arab Republic of Egypt
and USAID/Cairo

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PREFACE

This Fertilizer Policy Impact Study, sponsored by the Ministry of Agriculture and Land Reclamation (through the Principal Bank for Development and Agricultural Credit–PBDAC) and the United States Agency for International Development (USAID), was conducted by a technical team provided by the International Fertilizer Development Center (IFDC) under USAID contract number 263-0202-C-00-3043-00. The team consisted of three IFDC technical specialists, a cooperative business consultant, and four Egyptian consultants.

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Objectives and Methodology

The two major objectives of this study were: (1) to identify and recommend further policy changes required for the continued development of an open, competitive market for fertilizers and pesticides and (2) to make an assessment of the impact of the policy changes already enacted on the farm sector, the fertilizer production companies, the PBDAC, and the private sector.

An economic analysis, using secondary data, was conducted to compare the 6-year pre-reform period (1979/80 to 1984/85) with the 6-year reform period (1985/86 to 1990/91). This analysis was supplemented by an examination of the impact of the policy changes affecting fertilizer distribution on the private and cooperative sectors. An assessment of the operation of the current fertilizer and pesticide marketing system was made following field and production factory visits during January and February 1993. Finally, an assessment was made of the future development and further policy changes required to achieve an efficient open marketing system.

Acknowledgments

The study team wishes to acknowledge with gratitude the many persons who generously gave of their time and technical knowledge to assist with the research and preparation of this report. The team is particularly appreciative to Mr. Mahmoud Noor, Vice Chairman of the PBDAC, who provided the overall direction for the team's activities and to Mr. Mohamed Sabah, Head, Commercial and Production Sector of the PBDAC for the special assistance he provided.

Special appreciation must also be noted for officials of the Ministry of Agriculture and Land Reclamation, in particular Dr. Hassan Khedr, First Undersecretary for the Economic Affairs Sector, and Mr. Mahmoud Nazif, Undersecretary for Statistics, for their insight and provision of data; for officials of the Chemical Industries Corporation (CIC); and the fertilizer production companies.

The study team is also grateful for the assistance of the Chemonics APCP staff who generously provided their expertise, time and data. Special thanks go to Mr. Ron Krenz, Mr. Wilmot Averill, and Dr. Anwar Yousef for their counsel and their kind help in obtaining data for the report.

The helpful collaboration of the chairmen of the BDACs in the governorates visited, the private sector distributors and dealers, cooperative leaders, and the farmers of Egypt, whom we met during the field visits, is also highly appreciated.

This study was funded by the United States Agency for International Development (USAID) under USAID/Cairo contract number 263-0202-C-00-3043-00. Technical support and direction from the USAID/Cairo staff of the Office of Agriculture and Credit were greatly appreciated.

List of Acronyms and Abbreviations

AEU	Agricultural Engineers Union
ACP	Agricultural Production and Credit Project
APCP	Agricultural Production and Credit Program
AN	Ammonium nitrate
API	Agricultural price index
ARC	Agricultural Research Center of MALR
AS	Ammonium sulfate
BDAC	Governorate-Level Bank for Development and Agricultural Credit
Ca	Calcium
C&F	Cost & freight
CACU	Central Agricultural Cooperative Union
CAN	Calcium ammonium nitrate
CAPMS	Central Agency for Public Mobilization and Statistics
CIC	Chemical Industries Corporation, a Ministry of Industry holding company
CIF	Cost, insurance & freight
Cl	Chlorine
CN	Calcium nitrate
CPI	Consumer price index
CPIR	Consumer price index ratio
CSP	Concentrated superphosphate (37.5% P_2O_5)
DAP	Diammonium phosphate
DM	German currency unit (Deutsch Marks)
EAO	Egyptian Agricultural Organization
EEC	European Economic Community
EFDC	Egyptian Fertilizer Development Center
EMCIP	Egyptian Major Cereals Improvement Project
FAO	United Nations Food and Agriculture Organization
Fd/Fdn	Feddan (1 feddan = .41 hectare)
FOB	Free on board
FSU	Former Soviet Union
GDP	Gross domestic product
GIFAP	Group of National Associations of Manufacturers of Agrochemical Producers

GOE	Government of Egypt
ha	Hectare
IFDC	International Fertilizer Development Center
IMF	International Monetary Fund
IPI	International Potash Institute
KCl	Potassium chloride
Kg	Kilogram
K_2O	Potassium oxide
KNO_3	Potassium nitrate
KS	Potassium sulfate
L	Liter/Litre
LE	Egyptian currency unit (Pound)
MALR	Ministry of Agriculture and Land Reclamation
MAP	Monoammonium phosphate
Mg	Magnesium
mg	milligram
MOP	Muriate of potash
mt	Metric ton(s)
N	Nitrogen
Na	Sodium
NPKs	Blended or complex nitrogen, phosphate, potash fertilizers
NRC	National Research Center
P_2O_5	Phosphorus pentoxide
PBDAC	Principal Bank for Development and Agricultural Credit
SOP	Sulfate of potash
SSP	Single superphosphate
TSP	Triple superphosphate
UAN	Urea ammonium nitrate solution
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

1. INTRODUCTION

This study assesses the changes in the agricultural sector resulting from GOE policy reforms that have been progressively introduced since 1986. In particular, it examines the impact of the reform measures on the major parties involved in the supply and distribution of agricultural inputs: Egyptian farmers, the Principal Bank for Development and Agricultural Credit (PBDAC), the fertilizer production companies, and the private sector participants in inputs marketing. As a result of the research, the study concludes with a number of recommendations directed at maintaining the momentum of the reform program in the development of an open, competitive system of agricultural inputs distribution.

2. POLICIES PRIOR TO 1986

Prior to the reform period, heavy implicit taxes were imposed on agriculture through a pervasive system of government controls, which included the production, procurement, and distribution of fertilizer and other agricultural inputs (Section 2, pages 3-10). Beginning in 1976, the PBDAC was assigned a monopoly role for the procurement and distribution of fertilizer at controlled, subsidized prices. Although fertilizer use increased significantly over the next decade (Section 2, page 10), agricultural output failed to improve substantially, an important contributing element to the country's overall unsatisfactory rate of economic growth (Section 2, page 12).

3. POLICY REFORMS SINCE 1986

Recognizing that increases in agricultural output, including exports, were prerequisites for national economic growth, in the mid-1980s, the government introduced a broad-based program directed at the progressive deregulation of the domestic economy. This program included the market-based pricing of production, the reform of public sector enterprises, and privatization. In keeping with the intent of the reforms, beginning in 1988, fertilizer prices were successively increased and subsidies reduced (Section 3, page 15).

In mid-1991, all fertilizer subsidies were eliminated (except for subsidy on a limited amount of imported potash), the PBDAC distribution monopoly was terminated, and the cooperatives and private sector dealers were allowed direct access to fertilizer supplies at the factories. Ex-factory prices were set at full border-equivalent values, plus a 5% general sales tax (and a 2% commercial tax for the private sector). Subsidies on pesticides and interest rates for farm production loans were also systematically reduced or eliminated, and credit was changed from in-kind loans to cash loans (Section 3, page 16).

The study compares and analyzes change in the agricultural sector over two periods of time: the pre-reform period of 1979/80-1984/85; and the reform period of 1985/86-1990/91. The analyses include: crop and fertilizer prices, fertilizer use and costs, fertilizer product mix, pesticide use, production patterns, credit, farm income and foreign trade in agricultural products (Section 4, page 18).

4. FARM-LEVEL IMPLICATIONS OF THE POLICY ISSUES

The analyses of the impact of the policy changes on crop and inputs prices indicate clear improvements in production technology and profitability for key crops, except cotton, and a substantial decline in the real (deflated) prices for all fertilizer products and all nutrients, despite sharp increases due to subsidy elimination in 1990/91. The real overall nutrient price toward the end of the second analysis period (1985/86-1990/91) was over 41% lower than at the close of the pre-reform period and, on average, was 38% lower throughout the reform period than during the previous 6-year period. In addition, aggregate average fertilizer use was about 30.5% higher during the reform period (Section 4, page 20).

Although the elimination of the fertilizer subsidies had a negative impact on the usage rate of P_2O_5 and K_2O in 1989/90 and particularly during 1991/92, preliminary consumption estimates for 1992/93 indicate the fertilizer usage, on the whole, is back on track. Farmers are tending to substitute less costly N for P_2O_5 and K_2O. During the reform period, average aggregate fertilizer nutrient application rates ($N + P_2O_5 + K_2O$), based on both cultivated and crop areas, were higher by about 30% than during the pre-reform period (Section 4, page 20).

While the actual (nominal) costs of fertilizer use per feddan increased during the reform period, the real (deflated) costs decreased for all major crops throughout the entire 12-year period (1979-1991). Due to the combined effects of real price declines and improvements in production technologies, the real fertilizer costs per metric ton of crop output (except for maize and broad beans) declined during the reform period, as did the share of fertilizer costs in the total variable costs per feddan (Section 4, page 21).

During the reform period, the increasing availability of ammonium nitrate (AN) resulted in an increase in the share of this product in the nitrogen product mix. Following the full elimination of subsidies on nitrogen, the more favorable price of AN and its increased supply availability strongly influenced the growth in its use, and the relative declines in the usage of calcium nitrate (CN) and ammonium sulfate (AS). Following the subsidy elimination, the use of CSP also declined in relation to SSP use, despite a lower per unit nutrient price for CSP, indicating a deficiency in the marketing of CSP. The impact of the reforms, particularly the subsidy removals, on the use of potassium sulfate (KS) has been serious; consumption is now about half of the previous (already low) levels of usage. A strong technical and economic case exists for the importation of potassium chloride (KCl) to substantially reduce the farm-gate price of potash and to enable the termination of the current 60% subsidy (Section 4, page 22).

The crop production analyses indicate a major shift towards wheat. Its increased area, yields, and total production clearly demonstrate that farmers respond positively to the incentives created by the reforms. Although increases in the areas planted to maize grew only very slowly until 1990/91, there have been impressive production increases due to higher crop yields. Improved yields and reforms in marketing led to increased rice production, averaging 13%, during the reform period. The difficulties of changing cotton production policy and regulations have resulted in approximately a 2% decline in cotton planting relative to total crop area and an annual decline of 3.6% between 1979/80 and 1990/91. Current policy reforms, providing greater incentives, are directed at reversing this trend (Section 4, page 24).

Net farm income per feddan from the major crops was, on average, higher during the reform period in both nominal and real terms. The increase was greater for wheat, rice, maize and sugarcane than for either cotton, berseem, or broad beans (Section 4, page 28). However, real net income per feddan actually declined during the reform period until 1988/89, then increased during the next two years before declining again in 1990/91 and (based on preliminary data) in 1991/92. The increase in cotton net income per feddan up to 1990/91 was not sufficient to create crop area shifts which may have been further accentuated by the uncertainty of the reform process in cotton.

5. FOREIGN TRADE IMPACTS

A comparison of foreign trade levels between the pre-reform and reform periods shows that wheat and sugar imports increased substantially, in both quantities and values, while maize imports decreased. For exports, rice increased while cotton declined. In real terms, the value of exports and imports continued to decrease for all crops (Section 5, page 31).

6. FERTILIZER MARKETING REFORMS AND FERTILIZER SUPPLY

Progressive removal of indirect subsidies for fertilizer production has increased per unit production costs. Increased management autonomy given to the production companies, as a first step towards their eventual privatization, has led to ex-factory price increases based on full cost recovery, tempered only by urea and AN prices being set in reference to export realization benchmarks. Both urea and AN ex-factory prices, still, however, are slightly above border price equivalents, transferring costs and imposing tax on the farm sector. CN and AS ex-factory prices, determined by full cost recovery, are about 36% and 44%, respectively, above border equivalent prices. The relatively small share of total nitrogen represented by these two products (4% and 8%, respectively in 1991/92) means that both are in competition with urea and AN and they both have to be priced on this competitive basis. Phosphate product ex-factory prices, originally set on a full production cost basis in 1991, have been reduced near to market clearing levels with early indications of some recovery in demand as a result (Section 6, page 33).

A border price equivalent pricing rationale is presented together with a market clearing price basis for less preferred products (Section 6, page 46).

Import supplies and private sector participation in importing have been constrained by the imposition of a 30% tariff on nitrogen and phosphate fertilizers. Exchange rate reforms have eliminated the indirect subsidies on imports (Section 6, page 45).

After the first year of private sector liftings by distributors and wholesalers in 1991/92, the PBDAC withdrew from factory liftings and some factories imposed indirect constraints on private sector liftings, leading to a concentration of distribution and reduced competition. Volume discounts provided to distributors are encouraging this concentration. A lack of adequate variable seasonal discounts is not conducive to inventory holding, by distributors, wholesalers, or retailers, which is necessary to avoid spot shortages in peak demand periods (Section 6, page 38 and page 49).

7. MARKETING SYSTEM DEVELOPMENT

Following the reforms in 1991, the private sector reacted swiftly, and together with the cooperative sector (including the EAO), accounted for 22% and 20% of all factory liftings in 1991/92. During the first 6 months of 1992/93, with the disengagement of the PBDAC, the private sector share increased to 77% while the combined EAO and cooperative share remained at about 20%, although direct cooperative participation in liftings declined for various reasons (Section 7, page 53). Both national and regional distributors and brokers exist in the private sector; margins are slim; inventory turnover is almost instantaneous; and regional inventories are small or nonexistent. Distributor net margins are estimated at between 0.5% and 1.7% return to purchase cost depending on capital turnover. Without finance charges, net returns to capital employed vary between 25% and 100%, depending on the level of turnover. (Section 7, page 57).

All distribution is based on cash purchases (except from El Nasr Company) and all sales are made on a cash basis. The production factories sell on a delivered price basis perpetuating the freight equalization scheme formerly administered by the PBDAC.

The development of dealers (wholesaler/retailers) was more rapid in the Delta during 1991/92 than in Middle or Upper Egypt. During 1992, however, there was a later development of dealers (and a further expansion of distributors) into Middle and Upper Egypt (Section 7, page 55). A serious constraint to legal entry exists related to the combination of requirements for fertilizer licensing. As a result there are an estimated 5 to 10 unlicensed dealers to every licensed dealer (Section 7, page 56 and page 64). Overall marketing margins are estimated at about 10% and at about 5% excluding transport costs. These are slightly below marketing margins in Bangladesh for the private sector, and considerably below the previous PBDAC marketing margin.

The degree of competition at the wholesale and retail levels is considered to be adequate. This is reflected in the decreasing gap between cooperative and private sector prices, the narrow wholesale and retail margins in both sectors, and the high inventory turnover. To date, the distribution systems for fertilizers, pesticides, and seeds have grown along essentially separate lines (Section 7, page 62).

The development of a private sector marketing system has not been matched by development of a government controlled quality assurance system. This needs to be rectified (Section 7, page 68).

Overall, it is assessed that the privatization of fertilizer marketing is proceeding very well, but many recommendations are made for further improvements and to ensure a greater degree of participation and competition in factory liftings and distribution.

8. PESTICIDE MARKETING

Pesticide marketing, previously in the private sector for non-traditional crops, is expanding satisfactorily into the traditional crops as the public sector disengages. Although some concern has been expressed over cotton spraying by farmers and the private sector dealers, it is found that the private sector will have the ability and capacity to take over the government's role, but a clear program of government intent is required to signal to the private sector its need to plan for increased sales and application opportunities. Legislation on licensing and pesticide safety needs to be updated to the new circumstances (Section 8, page 70).

9. IMPACT ON PBDAC

The disengagement of the PBDAC from farm inputs distribution, including fertilizer, has had major impacts on the bank, including the creation of redundant personnel, loss of income, underutilization of storage facilities, changes in farm credit administration and control, and in the loss of information concerning farm input use by farmers. These impacts are reviewed in Section 9 (page 75) and Section 14 (page 131). Although further steps can, and must, be undertaken by the PBDAC to alleviate the negative impacts, the opportunities afforded the PBDAC to concentrate all of its resources on strengthening its position as a strong rural bank, serving the development interests of the country and its farmers, outweigh the current transitory problems. Consideration is given in the report to the future role of the PBDAC in fertilizer procurement and distribution (Section 14, page 134) and recommendations made for its complete disengagement by December 1993, except for the collation and analysis of fertilizer sector information required to assist in its banking activities.

10. IMPACT OF THE REFORMS ON THE COOPERATIVE SECTOR

Although the policy reforms have renewed the opportunity of the cooperatives to be involved in the supply and distribution of fertilizer (an area in which they were primary participants prior to 1976), for the first time they find themselves having to compete directly with private sector dealers. While the private sector moved quickly into all levels of the fertilizer trade, however, the cooperatives have moved much more slowly. As a result, the cooperatives lag far behind the volume of the private dealers (Section 10, page 84).

To be able to operate effectively in a competitive environment, the cooperatives will need to make elemental improvements in both their management capacities and their business operations (Section 10, page 91). Most importantly, the role and status of the cooperatives need to be clarified. Two basic issues should be addressed by government and cooperative leaders: (1) the issue of whether the cooperatives can fill a sufficiently important role in the agricultural sector to justify their continued costs and (2) the issue of continued government control and financial support versus full political, administrative, and financial autonomy (Section 10, page 95).

11. AGRONOMIC ISSUES RELATED TO AGRICULTURAL POLICY REFORMS

In the pre-reform period, and until 1991/92, fertilizer recommendations were an integral component of the controlled fertilizer allocation system administered by the PBDAC (Section 11, page 104). With subsidy removal and freedom of product choice, farmers reacted swiftly to market forces, substituting phosphate and potash fertilizers with nitrogen and increasing their use of lower unit cost nitrogen products. However, if market clearing prices are adopted for AS and CN, utilization of these will increase. In addition the need for balanced plant nutrition will soon become apparent. Nevertheless, improvements to fertilizer recommendations, making them more site specific, need to occur (Section 11, page 105) and the extension service should advise private sector dealers as well as farmers..

Allowing tariff free imports of fertilizer will assist in introducing new more cost effective fertilizer products, which, together with new locally produced fertilizers such as urea ammonium nitrate (UAN) solutions and NPKs, will increase farmer choice in product selection and efficient fertilizer use (Section 11, page 107).

Of all the agronomic issues related to fertilizer use in Egypt the one requiring the most urgent attention is the policy concerning the supply of potash. A strong technical and economic argument is presented (Section 11, page 110) for the importation and use of potassium chloride on a temporary basis until its use in Egypt and possible impact on soil salinity has been thoroughly tested. The reduced level of use of potash (from a previously already low level) is disturbing and action is required to increase its use in new land areas and for crops with high potash requirements.

Environmental problems concerning groundwater nitrate levels and pesticide safety are briefly discussed (Section 11, page 118).

12. FERTILIZER DEMAND PROJECTIONS AND THEIR IMPLICATIONS

Statistical estimates, derived from fertilizer nutrient consumption data for the period 1979/80 to 1990/91, were estimated using semi-log and double log functions (Section 12, page 121). These estimates take into account the technological (time) and real price effects on demand, but they are based on the assumption that the past trends influencing the growth of technology will continue in the future and, also, that past growth rates of expansion of cultivated area and crop areas are continued. Any significant changes in real prices will also impact on future demand. The lower (and upper) limits of the trend projections, in terms of annual compound growth rates, are N 4.09% (4.34%), P_2O_5 4.23% (5.78%), and K_2O 11.84% (13.07%). Full immediate removal of the subsidy on potassium sulfate would cause a significant increase in the real price of K_2O and reduce the growth rate projections. Replacement of subsidized potassium sulfate with unsubsidized potassium chloride would have an insignificant effect on the real price of K_2O.

Due to reduced demand and oversupply capacity of all fertilizer international prices are expected to decline in real terms for the rest of the decade. Domestic fertilizer prices based on border prices can therefore be expected to decline in real terms.

13. FUTURE TRENDS IN FERTILIZER USE

Peak demand period spot shortages of AN are forecast during May to July 1993, due to the absence of significant regional inventories and limited daily dispatch capabilities at the production sites. Farmers will be obliged to use either urea or imported AS to make up the shortfalls (Section 13, page 129).

The pricing and distribution recommendations, if adopted, will ensure that demand for CN, AS and CSP will recover to a certain extent, otherwise the fertilizer product mix will remain essentially unchanged, being influenced more by increased supply availability of domestic AN than any other factor (Section 13, page 127). New product introductions, from domestic production and imports, will gain niche markets (Section 13, page 128). Imported potassium chloride could replace, at a lower cost, potassium sulfate use on non-chloride sensitive crops (Section 13, page 128).

Table 1. Domestic Supply Demand Balance 1992/93 to 2000

Potential Supply		1993	1994	1995	1996	1997	1998	1999	2000
Nitrogen	Total	924	1,035	1,035	1,035	1,035	1,035	1,035	1,035
Phosphorus	Total	203	203	203	203	203	203	203	203
Potential Demand									
Nitrogen	Total	952	991	1,031	1,073	1,117	1,163	1,210	1,260
Phosphorus	Total	207	216	224	233	242	251	261	271
Potassium	Total	38	42	46	51	56	62	68	75
Export/(Import) Variance									
Nitrogen	Total	-27.55	44.00	4.00	-38.00	-82.00	-128.00	-175.00	-225.00
Phosphorus	Total	-4	-13	-21	-30	-39	-48	-58	-68
Potassium	Total	-38	-42	-46	-51	-56	-62	-68	-75

14. THE FUTURE SHAPE OF COMPETITIVE AGRI-INPUTS MARKETING

In Table 1 a comparison of current domestic supply capacity with the conservative level of projected demand for N and P_2O_5 indicates a continuing need for imports until such time as domestic demand justifies major new capacity investments (Section 14, page 131). At currently depressed world market prices new investments should be limited to existing plant modifications to improve operating efficiencies and/or expand existing capacities.

The development of the cooperative sector in fertilizer distribution could be expected to provide about a continuing 20% share of the total distribution (Section 14, page 132). Marketing system margins and prices are forecast to slowly increase over time as more value-added services are provided by distributors and dealers (Section 14, page 133). The development of a diversified dealer network, some low-cost, minimal service dealers, and some higher-cost, full service dealers is expected and should be encouraged (Section 14, page 133). There is a need for dealer training in fertilizer technology and business management.

Continued PBDAC participation in fertilizer procurement and distribution is not recommended (Section 14, page 134) and any future market interventions should be limited to advisory actions only (Section 14, page 136). However, the PBDAC has legitimate reasons for maintaining a current management information system on the fertilizer sector and is encouraged to do so (Section 14, page 135).

15. ISSUES AND RECOMMENDATIONS

The major issues and recommendations are presented in Section 15, pages 138 to 158. The major issues considered, where further improvements in operating procedures or additional policy changes are considered necessary, fall into the following categories:

Domestic Production	(page 138)
Ex-Factory Pricing	(page 149)
Import Regulations and Tariffs	(page 143)
Export Strategies	(page 145)
Freight Equalization	(page 146)
Fertilizer Licenses	(page 146)

The recommendations are based on the analyses presented in the report and on the principles of open competitive marketing. These principles include, the freedom of entry and exit, an appropriate degree of competition, equal terms and conditions for all participants, economic pricing of supplies based on appropriate border equivalent prices, resource allocation based on market forces, and such regulation as is required to ensure consumer protection and safeguard national interests.

Minor recommendations are also provided within the body of the report.

16. CONCLUSION

The bold initiatives in policy reform taken by the GOE since 1986 have created very positive responses in the agricultural and fertilizer sectors. The privatization of agri-inputs marketing, while still in a transitory phase, has progressed rapidly and the private sector has responded positively to the policy reforms. Some concerns are apparent with regard to the adoption of fertilizer ex-factory pricing policies, the concentration of distribution within the private sector, the abilities of the cooperative sector to compete with the private sector, and the barriers to entry created by the current licensing system. The recommendations provided address these concerns and will ensure the continued progressive development of an open market system for the benefit of Egypt's farmers.

1. INTRODUCTION

During the mid-1980s, after about three decades of substantially discriminatory policies against agriculture, Egypt initiated a serious policy reform program. Major policy changes since 1986 are discussed in Section 3. This study makes an assessment, albeit a preliminary one, of the changes in the agricultural sector induced by the policy changes, more specifically the impact of policy changes in the agri-inputs sector. The reform measures are being incrementally initiated. For example, for the cotton crop substantial changes were announced as this study was being initiated. Egypt is in the process of relaxing strong regulatory controls over broad spheres of economic activity.

The reform program has indeed been carefully structured and sequenced. This is indicative of the government's desire and earnestness in moving the agricultural pricing policy regime toward developing a competitive, market-based and outward-oriented agriculture. This new strategy is a welcome move.

A recently completed 18-country World Bank research project entitled "A Comparative Study of the Political Economy of Agricultural Pricing Policies" indicates that from 1965 to 1985 the price regime in Egypt discriminated substantially against agriculture. The five main crops included in the study were heavily and consistently taxed throughout the period, through direct and indirect price interventions. Rice and cotton, the two important export earning crops, were the most heavily taxed. Wheat and maize were also taxed but to a lesser extent than the export crops. Correspondingly, the public sector cotton industry and domestic consumers of rice and wheat received substantial subsidies during most of these years.

Subsidies on tradable inputs like fertilizer, which were intended to reduce the burden on and encourage the production of farm commodities, could not compensate significantly for the high level of discrimination against agriculture, evidenced by low producer prices and an overvalued exchange rate, because of the relatively smaller share of the tradable inputs (and a high share of non-traded inputs) in the total costs of production and because the prices of non-traded inputs like labor rose faster.

These price intervention policies adversely affected the country's foreign exchange earnings over the period studied (1965-85). Had there been no such price interventions on cotton, rice, wheat, maize, and sugarcane, the annual improvement in the foreign exchange position of the country would have been equivalent, on average, to 22.75% of the value of total exports (Dethier 1992, pp. 51, 52).

This study, therefore, is an attempt to assess the impact that policy reform measures are having on the major parties involved, that is, the farm sector, the PBDAC, fertilizer producing companies, and the private sector. Recommendations are made to keep the momentum of the reform program on track for the development of a competitive, market-based and outward-oriented agricultural sector in Egypt. This assessment is intended to contribute to a timely monitoring of the impact of the policy reforms.

2. POLICY ISSUES AND PROBLEMS FACING THE FARM SECTOR PRIOR TO 1986

2.1 INDIRECT (MACRO) INTERVENTION POLICIES

During the mid-1980s, Egyptian policy framework became increasing concerned about the problems of agricultural growth and export performance. That agriculture specific policies had directly suppressed producer prices and that the overall policy framework had indirectly further intensified this suppression was being increasingly realized. Such indirect intervention policies included exchange rate, trade, fiscal and monetary policies, and the overall industrial protection policies. These policies resulted in overvaluation of the nominal exchange rate defined as US$/LE. The use of overvalued exchange rate made wheat imports cheaper and domestic production of wheat less attractive. It imposed an export tax on exportables like cotton, rice, and other commodities.

Agricultural exports became insufficient to cover the costs of food imports. Import sufficiency ratios , that is sufficiency of agricultural exports to pay for food imports, declined from about 300% in 1973 to only 18% in 1990 (Salama, 1992). This stagnation of export performance contributed directly to the inadequate performance of the economy as a whole. At the same time, food self-sufficiency ratios declined due to the stagnation of domestic food production.

2.2 FARM PRODUCTION CONSTRAINTS

In addition to the macroeconomic policies, there were many government interventions constraining farmer decisionmaking and resource allocation and, in turn, affecting the supply of farm products. To meet the policy requirements of cheap food and clothing for consumers and industry, compulsory delivery quotas at fixed prices were imposed for selected crops. Cotton and sugarcane prices were set by the government and farmers were required to deliver their entire output to government agencies. Fixed quotas of rice, sesame, and groundnuts at set prices were required to be delivered at collection points; however, the remaining portion of the crop could be freely sold in the market. Prices were also fixed for some non-quota crops, and regulated for vegetables and fruit at both the wholesale and retail levels. Agricultural inputs were supplied at subsidized prices but rationed to allocate the limited supplies. The rotational sequence of crops and area allocations were also determined by the authorities. Additional regulations covered production practices such as the timing for planting, harvesting, and irrigating. Fertilizer rates and timings, application methods for pesticides, and specifications for the preparing and handling of crops to be marketed were also covered by regulations.

These direct forms of intervention were pervasive and did not leave much scope for farmers to make their own decisions. This system of governmental production control and resource allocation, together with indirect macro and industrial policy interventions, imposed heavy taxes and severely constrained the farm sector. This taxation of the farm sector, in the sense of a large gap between the border prices and the prices received by farmers, was indeed excessive (Dethier, 1987, 1992)

2.3 FARM INPUT POLICIES

In Egypt, the government has been heavily involved in the supply and management of agricultural inputs. Most inputs, imported or domestically produced, were sold at subsidized prices. Fertilizers, pesticides, improved seeds, fuel, machinery, and feed concentrates were directly subsidized. Irrigation costs (investments as well as operating costs), exemptions and non-revision of land and income taxes, agricultural research and extension constituted the indirect subsidies. Agricultural credit was also heavily subsidized.

As the control of cotton pests is critically important, the use of pesticides for cotton crops is about 80% of the total pesticide use in the country, and the remaining 20% is used for fruits, vegetables, and other crops. For cotton and sugarcane, the spraying of pesticides, and in some cases the spraying of fungicides, on rice was carried out under direct government control at subsidized costs.

These input subsidies were designed to soften the impact of the heavy taxation of agriculture. Authorities were convinced that subsidization of agricultural inputs and other public investment policies should adequately compensate the direct and indirect taxation of agriculture. Evidence, however, is clear that despite the subsidization policies, there remained a substantial tax on agriculture. In addition, the direct regulatory controls were serious handicaps for the farm entrepreneurs to exercise their allocative capabilities to make marginal adjustments in their farming operations. Despite the subsidies, even after accounting for public investments and other expenditures, there were high levels of resource transfers out of agriculture until 1981 (Dethier, 1987, 1992).

2.4 FERTILIZER SECTOR

2.4.1 **Production of Fertilizers**

The production, procurement, and distribution of fertilizers functioned under the control of GOE through two public-sector monopoly organizations—one for production and the other since 1976 (PBDAC) for procurement (including imports) and distribution. Almost all cultivated land in the country is irrigated and highly suited to a diverse set of crops making it possible for Egypt to have one of the most intensive farming systems in the world. The total cultivated land of about 6 million feddans, during the mid-1980s, was planted on an average 1.9 times per year. The systems of agricultural research has been efficient and the rate of technology adoption, in terms of modern varieties of wheat, rice, maize, vegetables and horticultural crops, has been high (Tables 15.1, 15.2, and 15.3). These factors lead to a rapid rate of expansion in the use of fertilizers. Over the period of 1961-1986, total nutrient use (N + P_2O_5 + K_2O) expanded almost four times from 252 thousand mt to 965.8 thousand mt (Bremer-Fox et al., April 1987).

Egypt has a long history of producing nitrogen and phosphate fertilizers. The structure of the industry in terms of the product-mix produced in the mid-1980s is shown in Table 4.4.1. The products were sold only to the PBDAC at prices fixed by the government sufficient to recover cost of production. For some years, prices paid by PBDAC to the factories were lower than the production costs, but the factories were reimbursed for the difference by the government. Until 1973, the domestic fertilizer industry was protected by taxing imports. After that time, they were subsidized (Deither, 1987, 1992).

Over time, the fertilizer industry continued to expand, but as fertilizer consumption increased, domestic production had to be supplemented by imports. As there are no potash deposits in Egypt, all of the potash requirements were imported. During the year 1984-1985 about 54 thousand mt of nitrogen, 35 thousand mt of P_2O_5, and 35 thousand mt of potash were imported; while 543 thousand mt of nitrogen and 133 thousand mt of P_2O_5 were produced domestically. Thus about 9% of nitrogen requirements, 20.8% of P_2O_5, and all of potash needs were imported.

National issues relating to fertilizer production policies included product-mix, quality questions, the relationship of the ex-factory prices (costs of production) to border equivalent prices, and questions of factory level management.

The type of fertilizer product-mix being produced during the early and mid-1980s in Egypt was the result of the historical development of the industry and we need not go into the causes of those developments. The only point of importance, in this context, is that the product-mix was not cost efficient for meeting the nitrogen and phosphate requirements of Egyptian agriculture in the sense that the cost of nutrients could have been substantially lower if a higher nutrient content product-mix had been used. As the need for sulfur on an agronomic basis had been identified in some parts of the country, the use of AS and SSP was encouraged. Under competitive, market-based arrangements for the supply of these products, their market share in all likelihood would have been different. This question has important efficiency considerations involved.[1]

There have been product quality, bag quality, and bagging complaints.[2] There has, most of the time, been a divergence between the border-equivalent prices and the factory-gate prices.

It is problematic to talk about factory level managerial and response questions during the pre-reform period. As factories sold all their products at fixed prices only to the PBDAC, the factories had no sales or marketing responsibilities. Managers were mainly responsible for operating the factories at full or near capacity levels. As their employment and investment policies were also determined by the government, the minimization of costs also becomes a problematic criterion for their operational and managerial responses.[3]

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1. These products after 1991 reforms in the marketing sector showed a marked drop in sales.

2. These problems are already much less and improving.

3. Subsequently comments would be made about the response of the factories in terms of their sales and pricing policies after the 1991 policy reform to allow the factories to sell their products directly to the private sector buyers and have a role in pricing their products.

2.4.2 Procurement, Distribution, and Marketing

Responsibility for the procurement of fertilizers from domestic producers at fixed prices and for imports rested solely with the PBDAC. As a state monopoly, PBDAC was also solely responsible for the distribution of fertilizers to the farm sector at prices fixed by the government and for the administration of the fertilizer subsidies. This highly complex distribution system for fertilizers operated until January 1988 when the reduction of the subsidies to the farm sector was initiated.[4] The system formed an integral part of the government's control of production, import, distribution, and use of fertilizers. The major characteristics of the system, subsequent policy changes and impacts are summarized in Table 1. Characteristics of the old system included:

1. Governorate and national level requirements were calculated based on the official fertilizer rates and prescribed village cropping patterns and rotational sequencing requirements.

2. Estimates of domestic fertilizer supplies were calculated based on the production plans of the manufacturing companies and the estimated total import requirements were developed.

3. Depending upon availability of foreign exchange resources, a final determination was made of the amount of fertilizer that could be imported.

4. Domestic supplies were sold by the factories to PBDAC at fixed, government controlled prices. Delivery costs to the governorate level warehouses or district shounas were met by the PBDAC which contracted with transport unions for transport, insurance, and product losses in transit. Unloading at the warehouses and shounas was the responsibility of PBDAC.

5. PBDAC, the only buyer of fertilizer from the manufacturing companies, was obliged to accept all of the production and had little or no control over product or packaging quality.

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4. Subsequent policy changes when subsidy was eliminated are described in Section 3.

Table 2. Fertilizer Policy Reforms - Egypt

BEFORE	AFTER	IMPACT
Demand forecasting based on official rates and prescribed cropping patterns.	No centralized demand forecasts. Farmer choice on cropping areas and fertilizer rates.	Dealers and distributors responsible for demand forecasts. Factory problems determining domestic demand.
Domestic supply, import need, and export availability centralized.	Freedom to export and import for all parties except potassium sulfate	No direct control over factory exports and import requirements.
Foreign exchange availability controlled at concessionary rates.	Foreign exchange available at market rates.	Increased nominal import costs. No implicit subsidy to farm sector.
Domestic supplies at administered prices to PBDAC monopoly.	Factories free to set prices and no distribution monopoly.	Cost plus pricing by factories except for urea and AN. Tax transfers to farm sector. Competitive distribution.
Import supply by PBDAC tender.	Private sector imports.	Lower potential import costs.
No intergovernorate movement of fertilizer after initial delivery.	Freedom of fertilizer movement.	Increased competition.
Retail prices administered.	No price controls.	Retail prices set by market forces.
Pan-territorial pricing by PBDAC.	Regional freight equalization by factories.	Continued non-competitive freight. Continued price distortion.
Subsidized retail prices uniform per kilogram N and P_2O_5.	Unsubsidized market prices and price differentials between products.	Lower use of Calcium Nitrate and Ammonium Sulfate. Lower use of phosphates.
Highly subsidized potassium sulfate.	Subsidy reduced to 60%. Price increased from LE57 to LE385.	Sales reduced by 50%.
In-kind subsidized credit.	Cash credit only, non-subsidized except for cotton, sugar and oilseeds.	Reduced formal credit use by farmers.
Farmers not complying with crop or credit controls required to buy unsubsidized fertilizer.	Farmers free to buy all needs at market prices.	Competitive pricing and economic fertilizer use.
Farmers could only buy from local mandoubiah or cooperative and accept what products were available.	Freedom to buy from any seller.	Increased competition and product quality.
Fertilizer supply quotas per feddan almost same throughout country for each crop.	Freedom to use any rate or product.	Increased urea and AN sales, reduced phosphate and potash sales.

6. Import requirements were procured by PBDAC through an arrangement of international tenders. Some AS imports were made from the U.S.S.R. under counter-trade arrangements. AS imports were made bulk, bagged at the port, and distributed to warehouses or shounas under PBDAC arrangements and control. AN was imported in bags.

7. Once the deliveries to governorate-level warehouses or shounas were received, intergovernorate movements of fertilizer were restricted.

8. Within the governorates, transfers of fertilizer from the warehouses and shounas to mandoubiahs were the responsibility of the BDACs using smaller trucks operated by the cooperative trucking companies.

9. Retail sales to farmers were made from the mandoubiahs at fixed subsidized prices (based on rationed, crop-by-crop quotas). In addition, there were very limited sales at nonsubsidized prices. The unsubsidized retail price was computed basically to include the unit subsidy.

10. Retail subsidized prices were set pan-territorially and were uniform throughout the country for each fertilizer product. This involved the equalization of transport costs by the PBDAC.

11. Until 1987-1988, the subsidized prices per kilogram of nitrogen were basically equalized irrespective of the product source. Similarly P_2O_5 prices were also equalized irrespective of the source.

12. Imports of fertilizer were priced to PBDAC at lower exchange rates lowering PBDAC's import costs and providing an implicit subsidy to the farm sector.

13. Sales of fertilizers were made on a highly subsidized system of credit in-kind.

14. Farmers who did not accept the rotation, those who did not deliver their crop quotas, and those who did not pay back the loans on time were required to buy their fertilizer at unsubsidized prices.

15. Farmers were required to buy the fertilizer only from the local mandoubiahs and accept whatever types were available.

16. Fertilizer supply quotas per feddan for a particular crop were almost the same all over the country.

Two factors are critical to enable farmers to make an optimal use of fertilizers: free access to products of their choice and competitive prices. These two factors are critical to the efficiency of a fertilizer marketing system. From this perspective, it seems fair to say that the fertilizer distribution system in Egypt was not appropriately designed. The whole agricultural system was under rigorous controls including the fertilizer distribution system. It was not designed to procure and distribute fertilizer supplies according to market demand. The system, in fact, may have done this quite well, but the combined effects of pan-territorial pricing, uniform nutrient pricing, subsidies, rationing and various controls and production interventions were not fully understood. Yet these policies affected the performance of agriculture and the economy because misallocative and incentives effects generated by such a system are of critical importance in growth performance. For example, pan-territorial pricing subsidizes remote and inaccessible areas relative to more favorably located ones through transport subsidies. This can result in uneconomic patterns of production. Similarly, subsidies on fertilizer accompanied by quotas and low interest loans result in the development of a black market in fertilizers and undermines the efficiency of agricultural production. The equalizing of nutrient unit prices, irrespective of the product source, to facilitate regional allocations of fertilizers leads to an uneconomic pattern of fertilizer consumption and prevents the farmers from using the products of their choice at the optimal application rates.

2.4.3 Fertilizer Use

Egypt is a major consumer of fertilizers, especially nitrogen. During the first part of the 1980s, the proportion of N, P_2O_5 and K_2O was 80.9%, 17.3% and 1.8%, respectively, with the proportion of P_2O_5 and K_2O growing relatively faster. For the 6-year period 1979/80 to 1984/85, the average use rates of N, P_2O_5, and K_2O per feddan of net cultivated areas were 106.31 kg, 22.88 kg, and 2.34 kg, respectively. These rates per feddan of crop area were 56.13 kg, 12.10 kg, and 1.24 kg, respectively. Thus the total N, P_2O_5 and K_2O use was 131.42 kg per feddan (315.24 kg/ha) of cultivated area, and 69.47 kg per feddan (166.63 kg/ha) of gross crop area (Table 4.3.2).

Over time, there has been a secular growth in fertilizer use in Egypt. Growth rates calculated for the periods 1970-91, 1975-91, and 1980-91 indicate that the use of potash has been growing faster than that of P_2O_5, and the use of P_2O_5 has also been growing faster than N (Table 4.3.1). But potash, for which there is no domestic source and is totally imported as KS, has a relatively small share in total fertilizer nutrient use. This may be, in part, due to its high import cost which limits the use only to a few crops like potatoes, sugar, fruits, and vegetables. Nitrogen and phosphatic fertilizers are used more widely. During 1984-85, the total consumption was: 640,931 mt of nitrogen, 164,841 mt of P_2O_5, and 24,243 mt of K_2O.

Regional patterns of fertilizer use prevailing during the mid-1980s (1983/84 to 1987/88) in terms of N, P_2O_5 and K_2O are shown in Tables 15.11 and 15.12. It appears that in Upper Egypt there is a higher share of K_2O in total nutrient use than in Middle and Lower Egypt. On the other hand, the share of P_2O_5 in total nutrient use is the lowest in Upper Egypt and highest in Lower Egypt. The share of N use is about 4 percentage points lower in Lower Egypt than Middle Egypt and three percentage points lower than Upper Egypt. It is difficult to explain, however, whether these differences in regional usages were due only to crop and soil requirements or to fertilizer supply and quota restrictions.

Rapid improvements took place in the agricultural technology base of Egyptian agriculture during the 1970s and 1980s. These developments for wheat, rice, and maize are captured in Tables 15.1, 15.2 and 15.3, which show the replacement of crop areas under old crop varieties by new high-yielding varieties not only that consume higher levels of fertilizer per unit of land but use it more efficiently so that nutrient use per ton of crop output is reduced. As a result of these technology improvements, fertilizer application rates per feddan for most crops increased at a rapid rate. This change in the application rates of fertilizer is reflected in Table 15.9 in the form of increases in the recommended application rates of N for various crops during the period 1975-85 due to improvements in crop response.[5]

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5. Subsequent development in agricultural technology improvements after 1984-85 and the impact on fertilizer use are discussed in Section 4.

As was pointed out in the previous section, however, excessive regulations caused misallocation in input use on different crops in different regions. Accordingly, farmers benefited differentially from input subsidies and other policies. Benefits (and costs) of these non-market policies differ by location, product, and farm size, etc., leading to uneconomic patterns of production activities.

2.5 RATIONALE FOR POLICY CHANGE

The 1980s were a generally difficult time for most developing countries (recession of the early 1980s and the debt crisis). Egyptian foreign exchange sources began to decline after 1981 and in the mid-1980s, debt service became the largest challenge. It was realized that higher rates of growth could only be achieved after significant reforms were carried out in almost every aspect of economic policy. The failure of agricultural output (and agricultural exports) to grow had been one of the main factors contributing to unsatisfactory economic growth. Thus an increase in agricultural output and productivity was considered a prerequisite for growth. It was clear that policy reforms to reduce discrimination against agriculture would be needed if overall economic growth and growth of agricultural production were going to accelerate. The need for reform became both a political and economic imperative. It is important to catch the significance of this as a turning point for the country's agricultural pricing policies and a commitment to a more liberal agricultural pricing policy regime for the future. This change in outlook was facilitated by the World Bank's 18-country study (including Egypt) which clearly demonstrated a high average rate of taxation of producers (and subsidization of consumers) caused by indirect interventions (exchange rate and trade policies), benefiting the public sector cotton industries, the livestock and poultry industries, and consumers of wheat, rice and maize.

It had been well established that these intervention policies had a large impact on the farm sector, and that in addition to output effects due to direct price interventions, exchange rate overvaluation and trade policies also depressed crop output, and that a favorable price environment could have induced a faster rate of development which, in turn, would have increased output.

In the past, industrialization to raise per capita incomes was accorded a central place. This had been a dominant policy since the mid-1950s. Agriculture was taxed to raise surplus resources for industry because it was believed that the taxing of agriculture could be accomplished without large economic costs as farmers (and farm output) were unaffected by economic incentives. By mid-1980s, this policy had undergone a complete change.

3. POLICY REFORM SINCE 1986

As mentioned in Section 2.5, despite a large increase in foreign exchange earnings from exports of oil, worker remittances, revenues from the Suez Canal, and tourism during the mid-1980s, Egypt remained in serious economic difficulties due to long-standing structural problems. Domestic consumption and imports continued to grow rapidly with the result that external debt, debt services, and balance of payments problems multiplied. The World Bank study (Dethier, 1987, 1992) had shown that direct and indirect agricultural pricing policies had heavily taxed agriculture and caused a slow down of agricultural and economic growth. The policy of taxing agriculture to promote industrial growth and provide cheap food was no longer sustainable. The GOE, therefore, decided to reform economic policies, including those affecting agriculture.

The main objective of the reform program is to create a market-based outward-oriented economy. To achieve this, the government decided to initiate a broad-based deregulation of economic activities, including market-based pricing of production, public enterprise reform, and privatization. A brief description of the policy changes affecting agriculture since 1986 is provided in the following sections.

A. SECTOR SPECIFIC POLICIES

The system of governmental production controls started to relax under the policy reform program in 1986 and has since been largely dismantled in gradual but carefully measured increments.

3.1 CROP PRICING

Starting with vegetables and fruits, price controls at the wholesale and retail levels were eliminated by 1986. In 1987, price controls were eliminated from all crops except cotton, sugarcane, and rice, leaving the prices of the two most important export crops still under government control. In the case of rice, the elimination of price controls was implemented in 1991. The price of rationed rice was also increased with the result that the demand for rice is now met only by the free market. Cotton prices for the 1992 crop were targeted to be 66% of the border world market price and in 1993 cotton prices are liberalized. The price of wheat for domestic producers is heavily affected by public sector import and subsidy policies on flour and bread. However, increases in the retail prices of flour and bread are occurring.

3.2 CROP PRODUCTION, AREA ALLOCATION, AND COMPULSORY PROCUREMENT POLICIES

Most of the direct controls on production, crop handling, delivery quotas, crop area allocations, and rotational crop sequencing were removed in 1987, except for cotton, sugarcane, and rice. In 1991, most of the controls were removed from rice production, although irrigation water allocations still restrict rice production to the traditional areas in the Delta.

3.3 CROP MARKETING AND EXPORT POLICIES

Compulsory delivery quotas for crops other than cotton and sugarcane were eliminated in 1987 and 1991 (rice). Direct controls on exports, storage, domestic trade including intergovernorate movements, and milling of rice were liberalized in 1991. Rice exports are allowed by the private sector, which is also permitted to retain export earnings at the market exchange rate. Also, the producers procurement price for the domestic market was increased.

The marketing of wheat was liberalized in 1987. There has also been some increase in the milling capacity which increases demand for domestic wheat. The demand for domestic wheat, however, is heavily influenced by wheat and flour import and pricing policies. During 1991, wheat, flour, and bread prices were increased, resulting in increased demand for domestic wheat. The policy of the pan-territorial pricing of wheat flour and bread has not yet been changed, distorting the pattern of consumer demand and leading to uneconomic substitution effects (in consumption) on substitute commodities, which, in turn, results in uneconomic patterns of production. Similarly, domestic production and markets for oil seeds are influenced by subsidized pricing and public imports of vegetable oils.

3.4 FERTILIZER PRICING, SUBSIDY, AND MARKETING POLICIES

Fertilizers were distributed in Egypt solely by PBDAC which exercised a public sector monopoly. Sales at the retail level were made at fixed subsidized prices and the quantities were rationed with quotas fixed for each crop.

Since January 1988, the retail prices have been successively increased to reduce the subsidy levels. Since 1991, the fertilizer subsidy was totally removed (except for potash). At the same time, the private sector, Egyptian Agricultural Organization (public sector), and the cooperatives were allowed direct access to the factories to purchase (at fixed prices) and market fertilizers at prices determined by the market.

At the same time, subsidies were removed from PBDAC retail sales. Factories are now required to sell at nonsubsidized prices (full cost or border-equivalent prices) plus 5% sales and 2% commercial taxes. Fertilizer imports by the private sector have been allowed, but a 30% import duty has been imposed on nitrogenous and phosphate imports. This will inhibit competitive products from international markets from entering Egypt to improve the product-mix. Potassium sulfate remains the sole exception and is still imported and sold at subsidized prices by PBDAC.

3.5 OTHER AGRICULTURAL INPUTS

Except for cotton spraying, the pesticides market in Egypt is private and fairly competitive; only quality and safety controls are applicable. Subsidies on cotton pest controls have been decreasing since 1990. Electricity and petroleum, however, are provided at subsidized rates but prices have been increasing. Farm machinery sales continue to be subsidized. Except for new lands, irrigation water is supplied free of charge (which results in uneconomic use), but the subsidies on seeds have been decreasing since 1989. The privatization of seed marketing is expected to be accomplished in 3-4 years. In 1991, PBDAC discontinued the distribution of subsidized feeds and removed feed subsidies.

3.6 FARM CREDIT AND COMMERCIAL CREDIT

In 1991-92, when PBDAC curtailed retail operations of fertilizer, the system of in-kind fertilizer loans was changed to cash credit for the farmers. In 1989/90, interest rate subsidies for production loans were limited to strategic crops (cotton, sugarcane, sugar beets, rice, and soybeans) with loan limits. All other production loans are now expected to be made at commercial market interest rates. Loans to private sector dealers are made at market interest rates.

Low interest rate loans were provided by PBDAC for farm machinery, which along with the rising wage rates for labor in the rural areas, induced faster rates of agricultural mechanization.

B. MACROECONOMIC AND INDUSTRIAL PROTECTION POLICIES

By the mid-1980s, it was becoming apparent that industrial protection and macroeconomic policies imposed heavy indirect taxes on agriculture and that industrial protection policies taxed agriculture more than did real overvaluation of the exchange rates. Industrial protection policies reduced relative incentives for the entire agricultural sector and the overvaluation of the real exchange rate taxed all tradable agricultural products (Krueger et al., 1992).[6]

Thus, in addition to dismantling the direct agricultural pricing and trade (agricultural export and import taxes) policies, the GOE carried out several reform measures during the late 1980s and early 1990s to improve the macroeconomic and exchange rate policies. For example, raising of the interest rates to market rates and applying unified market interest rate policy to various types of economic enterprises, and in 1991 (after some halfhearted attempts on devaluation) allowing the foreign exchange rate to float freely. In addition, several fiscal measures to reduce public expenditures and reduce subsidies to public sector enterprises and food were also adopted. However, in our judgment, a substantial burden of indirect taxation still remains on agriculture due to industrial protection policies in support of inefficient public-sector processing industries for agricultural inputs and outputs to the extent that these policies have not been fully reformed. On an average for the period 1960 to 1984 such tax due to industrial protection in Egypt is reported to have been 27.5% (Krueger et al, 1992).

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6. The 18-country World Bank study (Krueger et al., 1992) shows that policies that depress agriculture's terms of trade below international levels are associated with slower economic growth, that GDP growth rose as the indirect taxation of agriculture fell, that greater exchange rate overvaluation was related to lower GDP growth, and that the stronger the level of industrial protection, the lower the GDP growth. The actual effect is contrary to the belief that economic growth could be accelerated by shifting resources from agriculture to industry.

4. FARM-LEVEL IMPLICATIONS OF THE POLICY REFORMS

One of the central issues of this study is how the reform measures are affecting the farm sector. As the reform measures have been accentuated incrementally, the impact of the reforms has also been slow to materialize, which makes it difficult to assess. The measurement of qualitative and quantitative impacts on the farm sector, therefore, must be carried out by comparing the pre- and post-reform periods in terms of important selected variables. The analytical scheme compares changes in 6-year averages of the two periods 1979/80-1984/85 and 1985/86-1990/91. Comparisons are also made between averages of 1979/80-1980/81 and 1989/90-1990/91. Some observations with the help of more recent current data, to the extent such data are available, are also offered.

4.1 CROP PRICES

During the reform period, the farm prices of crops (except seed cotton and sugarcane) were decontrolled over time and are now determined by market forces. Prices of seed cotton and sugarcane are still controlled but were raised. Tables 4.1.1 and 4.2.2 present the actual and deflated farm-level prices (deflated by consumer price index ratio (CPIR), 1979/1980 = 100) of 6 selected crops for the period 1979/80-1990/91. The tables also present average prices for the 1979/80-1980/81, 1979/80-1984/85, 1985/86-1990/91, and 1989/90-1990/91 periods. These averages are calculated to analyze changes in price levels between the pre-reform and reform period in order to derive some qualified inferences about the influence of the reform policies.

Farm-level prices are impacted by numerous factors; such as, (1) improvements in farm production technology, (2) increased exports (imports), other things remaining the same, would increase (decrease) farm prices, as would (3) changes (increases or decreases) in control (support) prices. This makes it difficult to isolate and determine the impact of only the reform measures. Nevertheless, some allocative implications of the reform impact may be discerned.

The policy changes appear to have had a relatively clear impact on wheat and cotton prices. As a result of an increase in the support price of cotton, its real price has started to increase. The raising of wheat flour and bread prices and the decontrol of their procurement prices and quotas have resulted in relatively larger increase in wheat prices (see Section 4.6). There has also been a rapid improvement in the production technologies of wheat, rice, and maize, resulting in supply shifts (Tables 15.1, 15.2, and 15.3) and increased profitability for these crops, despite some decline in their real prices.

4.2 FERTILIZER PRICES

Tables 4.2.1 and 4.2.2 show the nominal and deflated (by agricultural price index (API), 1979/80 = 100) prices of fertilizer products used in Egypt during the period 1979/80 to 1990/91. Corresponding weighted average nutrient prices are shown in Tables 4.2.3 and 4.2.4.

These data show a substantial decline in real (deflated) fertilizer prices of all products and all nutrients from the pre-reform period of 1979/80 to 1984/85, although the increase in the 1990/91 price over that of 1989/90, due to subsidy elimination, was sharp. But since this increase was much smaller for N (14.1%) compared to P_2O_5 (53.6%) and K_2O (409.1%) and since N forms about 80% of the total nutrient use in Egypt, the overall increase in real nutrient price (N + P_2O_5 + K_2O) from 1989/90 to 1990/91 was about 23% (these percentages are calculated from 1989/90 and 1990/91 figures in Table 4.2.4). It should be noted that, as a result of the subsidy elimination, the nominal price increase for urea was relatively small and its real price actually fell by 6.2% from LE 57.58 in 1989/90 to LE 54.02 in 1990/91 (in 1979/80 prices.)

Before the start of private sector marketing, nominal fertilizer prices until 1990/91 were kept fixed over long periods of time at subsidized levels with few upward revisions. And since the product prices were fixed at uniform rates for all products per kilogram of nutrient, the real product prices continued to decline over time for all products secularly. As a result, real nutrient prices also fell for all nutrients. The real overall nutrient (N + P_2O_5 + K_2O) price during 1989/90-1990/91 period was 41.3% lower than for the 1979/80-1980/81 period, and about 38% lower, on the average, during the 6-year period of 1985/86-1990/91 as compared to the 6-year period of 1979/80-1984/85, despite a sharp increase in P_2O_5 and K_2O prices due to subsidy elimination in 1990/91.

Fertilizer nutrient to crop price ratios for major crops, presented in Table 4.1.5 to Table 4.1.8, show substantial declines, ranging from 20% to 50%, between the average of the 6-year pre-reform period and the average of the 6-year reform period. During the reform period the nutrient to crop price ratios declined in all years except 1990/91, when the ratio values generally increased to the levels prevailing in 1984/85. Preliminary data for 1991/92 indicate increases in ratios of both N and P_2O_5 prices to crop prices.

4.3 FERTILIZER USE AND COSTS

The policy reforms which removed direct controls from the farm sector and changed output and input prices are expected to influence fertilizer consumption in the aggregate as well as the use rates and costs of fertilizer for various crops. Table 4.3.1 presents data on the aggregate consumption of fertilizer nutrients in Egypt for the period 1979/80 to 1990/91.

These data show that the aggregate use of total fertilizer nutrients (N + P_2O_5 + K_2O) in Egypt, on an average, during the 6-year period of 1985/86 to 1990/91 (reform period) was 30.49% higher than the average for the corresponding pre-reform period (1979/80 to 1984/85). From 1979/80-1980/81, 1989/90-1990/91 the aggregate use increased by 59.28%. Consumption of all the three nutrients increased from 1989/90 to 1990/91 but proportionately more of P_2O_5 and K_2O than nitrogen. During 1991/92 the aggregate nutrient consumption declined by 16.1% due to subsidy elimination, but the decline was relatively more for P_2O_5 (33.1%) and K_2O (24.1%) than urea (12.1%) because subsidy per metric ton for P_2O_5 and K_2O was much larger than it was for urea. Its elimination impacted more heavily on P_2O_5 and K_2O than urea. However, preliminary consumption estimates of 1992/93 based on the first 6-month actual factory sales, PBDAC stocks deflations, and on the fact that the first 6-month sales in the past were on an average, 46% of the annual sales indicate the consumption of fertilizer nutrients in the aggregate is on trend. Farmers now use relatively more N than P_2O_5 and K_2O because after subsidy elimination P_2O_5 and K_2O are relatively higher priced. Farmers are, it seems, substituting cheaper N for more costly P_2O_5 and K_2O.

4.3.1 **Fertilizer Nutrient Use Rates**

Table 4.3.2 indicates use rates, in kilograms per feddan of the cultivated and total crop areas, for N, P_2O_5, K_2O and (N + P_2O_5 + K_2O) for the years 1979/80 to 1990/91 and makes some comparisons between the pre-reform and reform period use rates. Use of all these nutrients continued to increase throughout the period, and during the reform period of 1985/86 to 1990/91, it was 164.97 kg of ($N + P_2O_5 + K_2O$) per feddan of cultivated area and 89.24 kg per feddan of crop area. These use rates during the reform period on averaged 25.52% and 28.45% higher than in the pre-reform period for the cultivated and crop areas, respectively. In 1989/90-1990/91, the use was 48.0% higher on the basis of cultivated area and 51.83% higher on crop area basis than it was during 1979/80-1980/81. The increase was proportionally higher for P_2O_5 and K_2O than N.

During 1991/92, after the subsidy elimination, the overall ($N + P_2O_5 + K_2O$) use rate declined over the 1990/91 use rate by about 15% on the cultivated area basis and 17.5% on the crop area basis. The relative decline was substantially larger for P_2O_5 and K_2O than N because the increase in N price (due to subsidy elimination) was much smaller. Again, our estimates show that aggregate ($N + P_2O_5 + K_2O$) use rates for 1992/93 are likely to be on trend, but the use rate for N increasing relatively more than P_2O_5 and K_2O, the phosphate product-mix and potassium sulfate being relatively higher cost than N.

4.3.2 Fertilizer Use Costs

Tables 4.3.3, 4.3.4, 4.3.5 and 4.3.6 present data on fertilizer use costs for important crops for the period 1979/80 to 1990/91. Table 4.3.3 presents actual (nominal) costs per feddan; tables 4.3.4 and 4.3.5 present costs per feddan and per metric ton of output by API (1979/80 = 100). Table 4.3.6 presents the shares of fertilizer costs in total variable production costs per feddan. Fertilizer use increases the productivity of land and other inputs and improvements in technology increase the productivity of fertilizer. So, as fertilizer use rates increase, with constant prices, fertilizer costs per feddan may increase, but with improvements in production technology, fertilizer nutrient use per metric ton of crop output (real costs/metric ton) is expected to decrease. The data presented in these tables throw some light in this changing picture.

The actual (nominal) costs of fertilizer use per feddan (Table 4.3.3) increased but real (deflated) costs (Table 4.3.4) decreased throughout the 1979/80 to 1990/91 period for all major crops included in the tables. During the reform period, the real costs (Table 4.3.4) were lower than the pre-reform period, on average, for wheat (-22.73%), rice (-28.98%), cotton (-38.64%), maize (-14.50%), sugarcane (-26.62%), broad beans (-6.27%), and berseem (-29.93%), but in 1990/91 there was a sharp upturn in the case of all crops studied because of price increase due to subsidy elimination.

Due to the combined effect of real price declines (Table 4.2.2) and improvements in production technologies, fertilizer use and crop yield continued to increase for all crops studied and, in turn, real (deflated) costs of fertilizer use declined substantially despite some upturn during 1990/91. On average, during the reform period, real (deflated) costs of fertilizer per metric ton of crop output were lower than those of the pre-reform period by 42.47% for wheat, 36.64% for rice, 24.63% for cotton, 32.75% for maize, 35.74% for sugarcane and 31.28% for broad beans. Despite some increases in 1990/91, costs during the 1989/90-1990/91 period were substantially lower than those of 1979/80-1980/81.

In Table 4.3.6, shares of fertilizer costs in total variable production costs per feddan are examined. During the reform period, on average, the shares were lower for wheat, rice, cotton, sugarcane, and berseem, but were higher for maize and broad beans. An increase in the fertilizer cost share for maize is due to the increased use of high fertilizer consuming maize hybrids since 1988. Because of the yield increase due to these hybrids, however, fertilizer use and real fertilizer costs per metric ton of maize actually declined (Table 4.3.5)

4.4 FERTILIZER PRODUCT-MIX

The mix of fertilizers available in the market and their prices (in terms of nutrient prices) largely determine farmers' choice of products. In the past, nutrient prices for N were uniform from all nitrogenous products and also for P_2O_5 from phosphate sources. For K_2O, there has been only one source, potassium sulfate. In addition, N, P_2O_5, K_2O prices were pan-territorially uniform and products supplied to different governorates were determined by the PBDAC. Thus, the farmers' knowledge of crop response to various products as sources of nutrient supply and prices played no role in their choice of a product. Data on product-mix as percentages since 1979/80 are presented in Table 4.4.1. The only relevant comment is that as a result of increased AN capacity since about 1988, and the declining production of CN, the unit price of N substantially came down, which became apparent after the elimination of subsidy in 1990/91. Since then, the shares of CN and AS in the product-mix have decreased substantially and, because of tied sales of AN to urea and export policies, the share of urea also declined. Thus, even though the unit price of N from the overall product mix declined, it was not as much as it could have if AN sales from the factories had been competitively priced relative to urea and not linked to it. In addition, ex-factory pricing of urea and AN now imposes a small tax on the farm sector since prices at the factory gate, after subsidy elimination, are higher than the border-price equivalent calculated from the FOB export prices (see Section 6).

The product-mix for the supply of P_2O_5 from domestic sources of supply is not cost efficient. It needs no calculation to say that high nutrient fertilizers like DAP, TSP, etc., are cheaper sources of P_2O_5 supply. The import of these fertilizers, and subsequently their domestic production, should be encouraged in order to provide Egyptian agriculture the cheapest and most efficient supply of P_2O_5. The production and sale of SSP and CSP should continue since they are being produced in old plants which are already paid up. The companies should be able to price these products lower than present prices in competition with imported products and to clear their stocks while operating at full capacity. Since these are low nutrient content fertilizers, the prices for them would have to be low to clear their stocks. It should be noted that since these factories are operating on a sunk cost basis, there would be no subsidy involved as long as the price is sufficient to recover the operating costs. This point is worth re-emphasizing since the use of P_2O_5 declined sharply in 1991/92.

For the supply of K_2O, potassium sulfate is the only imported source. There are no domestic potash supplies. However, potassium sulfate is a relatively low nutrient content and high cost source of K_2O compared to potassium chloride. Potassium sulfate may be more desirable for some crop and soil conditions, but for other crops and soil conditions potassium chloride may be equally desirable or more so on the basis of cost efficiency. In the world market, the use of potassium chloride is much more than potassium sulfate. Its import, therefore, should be allowed by the private sector to maintain a supply of K_2O for the Egyptian agriculture at reasonable costs.

4.5 PESTICIDE USE

The marketing of pesticides in Egypt is a private sector activity and numerous companies are competitively involved. Except for cotton and sugarcane spraying, the operations are carried out by farmers themselves, but even for cotton, a portion of the crop is reported to be treated by the farmers themselves. There are indications that because of competition and improvements in the quality and efficacy of pesticides, the costs of pesticide applications have, over time, been declining. The data on insecticide costs are first presented in Table 4.5.1 in actual (nominal) terms, LE/feddan of total cultivated area and total crop area, for the period 1979/80 to 1990/91, and then in deflated (or real) terms in Table 4.5.2. The data do not include MALR pesticide costs and represent only those costs of pesticides paid directly by farmers. These data show that, over all, on the basis of total cultivated area, the real costs in terms of 1979/80 prices declined from about LE 10/feddan in 1979/80-1980/81 to LE 3.80/feddan in 1990/91. In terms of total crop area, a similar decline occurred from LE 5.34/feddan to LE 2.06/feddan.

Data by crop for major crops on a per feddan basis are examined in Tables 4.5.3 and 4.5.4, and on a per metric ton basis in Table 4.5.5. Data on the share of pesticides in the total variable costs of production per feddan for various crops are presented in Table 4.5.6. Complete series for these micro data are available only for cotton and broad beans, but there is reasonable information for wheat, rice, and maize crops as well. These data clearly show, whether looked at on a per feddan basis or per metric ton of crop output basis, that the real costs (in terms of 1979/80 prices), except for broad beans, continuously declined for each of the crops examined.

In the case of cotton, the cost share of pesticides in the total variable costs of production per feddan also declined from 6% in 1979/80-1980/81 to less than 2% in 1990/91. For other crops, the pattern of cost change is uneven.

4.6 PRODUCTION PATTERN CHANGES

Policy measures affecting input and output prices affect the relative attractiveness of producing different farm commodities. They also affect the rates of improvements in production technology which, in turn, affect the relative returns from producing different commodities. Past policies which imposed heavier taxes on exportable crops like cotton and rice, and import substituting wheat and maize crops, shifted crop area to vegetables, horticultural crops, and berseem. Policy reforms since the mid-1980s are directed at eliminating these distortions and at creating a structure of incentives in agriculture in line with the international competitiveness of various farm commodities and reductions in the overall burden on agriculture to increase its contribution to economic growth. The policy reforms are directed at changing and improving resource allocation and patterns of production. This section analyzes changes and shifts in the crop pattern since the start of the policy reforms in mid-1980 by comparing the two 6-year periods after and before the start of the reforms for several important crops.

The changes are analyzed in area harvested, production, and yield. The measures of change used for the analysis are growth rates for the period 1979/80 to 1990/91; percentage changes, on average, between the pre-reform 6-year period (1979/80-1984/85) and the reform period (1985/86-1990/91), and between 1979/80-1980/81 and 1989/90-1990/91 (Table 4.6.1). Changes in the shares of individual crop areas as a total of all crop area harvested in the country are shown in Tables 4.6.2 and 4.6.3. Additional data and analysis by crop are presented in Annex Tables 4.6.1 to 4.6.8. The main conclusions for the major crops are discussed in the following sections.

4.6.1 Wheat

After a decline in the share of wheat area vis-à-vis the total crop area, there has been a major shift toward this crop. From the pre-reform period 1979/80-1984/85, on average, the area under wheat increased by 24.72%. From 1980/81 to 1990/91, the area increase was 53.04% and production increased at an annual rate of 8.65%. The reform measures, removing production and price controls and increasing the prices of flour and wheat bread, increased the relative attractiveness of wheat accelerating the adoption of production technology and improved yields at an annual rate of 4.82% from 1979/80 to 1990/91. On average, yields during 1985/86-1990/91 were about 35% higher than the pre-reform 6-year period, and in 1990/91 it was 56% higher than it had been in 1979/80. The share of the wheat area as a percentage of total crop area increased from 12.08% in 1979/80 to 18.74% in 1990/91, an increase of about 5.5% annually. This is quite a large shift which clearly demonstrates that the farmers, indeed, responded to the incentives created by the reforms.

4.6.2 Maize

There was a small increase of 0.5% in the area under maize cultivation during the period of 1979/80 to 1990/91, but a sharp increase of 9.7% in 1990/91 over 1989/90, leading to an increase in the share of maize area from 17.01% to 18.34%.

There has been an impressive growth in maize output at the rate of 4.11% per annum basically due to a yield rate growth. Yields during 1984/85-1990/91 period were, on average, higher by about 27% than 1979/80-1984/85 period, resulting in an overall yield growth rate of 3.6% annually from 1979/80 to 1990/91. Improvements in production technology, changes in policy on imports of meat (maize is primarily used for feeding livestock), and recent problems of the poultry production units have created incentives for maize production.

4.6.3 Rice

Average yearly production of rice during the reform period was 12.85% higher than in the pre-reform period, primarily because of rapid production increases since 1988/89, due basically to yield increases. The area under rice cultivation has remained largely unchanged, whereas yield was 12.28% higher in the reform period. From 1979/80 to 1990/91 production increased at an annual rate of 2.23% which was almost entirely 96.15% due to yield increases of 2.14% annually. The spurt in rice production seems to be the direct result of the relaxation of direct controls on rice production and exports and permission to use free market foreign exchange rate for rice exports–changes that increased the relative attractiveness of rice production.

4.6.4 Cotton

Cotton has historically been an important crop in Egypt. With a comparative advantage in the world markets, it has been a significant contributor to export earnings and to the government budget. Unfortunately, because of its attractiveness as an export earner and contributor to the government budget, and because of industrial protection policies for the textile industry, this crop became one of the most highly taxed. Because of the severe production controls, protection policies, the desire to provide cheap clothing to the consumers, and high export taxes, the relative attractiveness of growing cotton and investing in its production declined substantially. The share of cotton area in the total crop area of Egypt continuously declined from 11.33% in 1979/80 to a low of 7.22% in 1990/91. On average, during the 6-year period 1984/85-1990/91, the area under cotton declined by 9.76% from the 6-year average for 1979/80-1984/85. And the decline from 1979/80 to 1990/91 was almost 24%, with an annual rate of decline of 2.07%. Similarly cotton yields declined, on average, between the two 6-year periods by 17.4%, and from 1979/80 to 1990/91 by 23.6% at an annual rate of decline of 3.6%. Accordingly, production declined from 1979/80 to 1990/91 by 41.55% at an annual rate of decline of 5.07%. About 40% of this reduction was due to area decline and 60% due to yield decline.

Because of the complexity and difficulties of changing the policies affecting cotton, the reform measures have been delayed. As discussed earlier, cotton prices have been increased to some extent and other reform measures are planned. In 1993 liberalization of cotton production controls and prices is being implemented. Except for varietal controls, cotton production will be fully liberalized at the farm level and controls on procurement by cotton gins will also be liberalized. Incentives to produce cotton, however, are still heavily impacted by industrial protection and export policies.

4.6.5 Sugarcane

Like cotton, sugarcane production continues to be more directly controlled than most other crops. Due to the policy of protection of the milling industry, few changes in sugarcane production policies have taken place, although at the consumer level, some price increases for sugar have been made.

As a result of government programs, there have been production increases of about 3% per year since 1979/80, about 67% of which is due to yield increases and 33% to increase in the area.

4.6.6 Other Crops

Due to increases in the demand for barley, the relative attractiveness of this crop has resulted in an increase in the area under production

Areas under onion and onion production have declined in spite of yield improvements, perhaps because of less favorable demand conditions. Export opportunities should be explored for this crop.

In Upper Egypt sorghum and wheat are substitutes in consumption. Due to pan-territorial pricing of flour and wheat bread and their subsidized pricing, incentives to grow sorghum in Upper Egypt have eroded and the production area for this crop has been rapidly decreasing.

Production, yields, and areas of crops like tomatoes, potatoes, beans, lentils, sesame, and groundnuts have been improving throughout the 12-year period studied. These crops have not been under direct production controls and their demand levels and pricing have been market-determined. Farmers were able to make better resource allocation decisions for these crops than for those crops under direct controls.

4.7 AGRICULTURAL CREDIT

Data on the extent of loans to the agricultural sector from PBDAC for seeds, fertilizer, pest control and services in-kind and cash are presented in Tables 4.7.1, 4.7.2 and 4.7.3 for the period 1981/82-1990/91. In-kind loans were made for seeds, fertilizer, and pesticides, and cash loans were made to help farmers arrange services of labor and pest control. On the whole, in-kind and cash loans were of approximately the same total magnitude.

Over time, fertilizer loans as a percent of the total value of fertilizers sold (using retail level subsidized prices) continued to increase, from 57.1% in 1981/82 to 81.38% in 1990/91, although real prices of fertilizer were declining except in 1988/89 and 1990/91. Also, the value of total loans per feddan of cultivated and crop area continued to increase quite rapidly in actual money terms but not as fast in real terms (Table 4.7.1 and 4.7.2). All agricultural loans were at highly subsidized interest rates until 1991.

4.8 FARM INCOME

Net and total revenues per feddan for major crops are shown in Tables 4.8.1, 4.8.2, and 4.8.3, 4.8.4 respectively. Data on returns in Tables 4.8.2 and 4.8.4 are deflated (real) by rural consumer price index (CPI) (1979/80 = 100).

Table 4.8.2 shows that the average net income per feddan, for the reform period 1985/86-1990/91, was higher than during the pre-reform period for all crops studied. However, for broad beans and berseem, income increases relative to other crops were much smaller and growth rates for the period 1979/80-1990/91 were negative. For cotton also, the increase and growth rate of net income per feddan (relative to wheat, rice, maize, and sugarcane) were substantially smaller. It should also be mentioned that berseem, cotton, and sugarcane crops occupy crop land much longer than wheat, rice and maize crops; and thus they would have even lower relative net returns per feddan over a given time period. These data, therefore, predict a shift in the cropping patterns toward wheat, rice, and maize and away from cotton, berseem, and broad beans as shown in Tables 4.6.2 and 4.6.3. If the significance of cotton as an export earning crop has to be rehabilitated, further policy reforms will be necessary.

4.9 FERTILIZER SUBSIDY REMOVAL

The process of fertilizer subsidy removal started in 1988 and was completed in June 1991 except for potassium sulfate. Analysis so far has focused on the impacts of overall policy reform, not the impact of fertilizer subsidy elimination and privatization of fertilizer trade on fertilizer sales per se. Some of the impacts are assessed by comparing data averages for the 3-year period preceding the start of the process of subsidy elimination, that is 1985/86 to 1987/88 with the 3-year period 1988/89 to 1990/91, the period during which fertilizer prices were successively increased and finally subsidy was eliminated at the end of June 1991. Some observations are also added for the period immediately following subsidy elimination to the extent that data are available.

During the 3-year period 1988/89 to 1990/91 the real price of fertilizer nutrients (N,P_2O_5, K_2O) increased by 17.14% relative to the 3-year period 1985/86 to 1987/88 (Table 4.2.4) because of successive increases in the prices of various fertilizer products, N by 9.33%, P_2O_5 by 55.64% and K_2O by 28.14%. Changes in fertilizer use were; an increase of 5.05% in N, a decrease of 4.07% in P_2O_5 and 8.23% in K_2O and an overall increase of about 3% for N + P_2O_5 + K_2O (Table 4.3.1). At the same time the share of fertilizer cost per feddan in total variable costs had increased for all crops examined and real costs (LE/FD) had increased for all crops except berseem. However, because the real net returns for the major crops of wheat, rice, maize, sugarcane and even cotton were high up to the end of crop year 1989/90 the overall fertilizer use did not decline: rather it increased as a 3-year average.

The increase in real prices of fertilizer nutrients, resulting from subsidy reductions, was clear in 1990/91 (Table 4.2.4), followed by a corresponding decline in real net returns per feddan for major crops in 1990/91. As a lagged effect of these changes and a complete elimination of subsidy at the end of June 1991, fertilizer use in 1991/92 decreased from a high of 1,055,698 MT of nutrients in 1990/91 to 841,922 MT of nutrients in 1991/92. N declined from 841,177 MT to 738,950 MT (12.2%), P_2O_5 from 186,806 MT to 124,930 MT (33.1%) and K_2O from 27,715 MT to 21,042 MT (24.1%). The overall decline in the use of total nutrients was 16.17%. However, this decline appears to have been temporary. The privatized marketing sector and the farm sector were adjusting to the new pricing structure. By 1992/93, the aggregate sales of N, P_2O_5, and K_2O was already higher than the highest use in of 1990/91 (Table 4.3.1). The sale of N had increased from 841,177 MT in 1990/91 to 943,185 MT in 1992/93, by about 12%, compensating for decline in use of P_2O_5 and K_2O.

4.10 1991/92 CROP YEAR ANALYSIS

After the report was completed preliminary data on crop areas harvested , production, yields, prices and revenues were made available for the year from USAID/Cairo (Table 4.10.1). Tables 4.10.2, 4.10.3, and 4.10.4 were constructed to compare these preliminary data for 1991/92 with corresponding data for 1990/91. The comparisons indicate that:

1. Nutrient to crop price ratios in 1991/92 were higher than 1990/91.
2. Nutrient use in total as well as per unit of crop area declined.
3. Crop yields, except broad beans, increased.
4. Total crop output increased, except for broad beans and maize.
5. Harvested crop areas of wheat, cotton and maize declined but rice, broad beans and sugarcane increased.
6. Net revenue per feddan decreased, except for cotton.
7. Shares of crop areas of wheat, berseem, cotton and maize, in total crop area, declined and those of broad beans, rice, tomatoes and potatoes increased.

Increases of cotton and rice yields and total output occurred despite a substantial increase in the nutrient to crop price ratios for these crops. It appears that farmers in response to the price and policy reform measures were adjusting their cropping patterns and allocation of inputs' use. As further improvements in cotton reform policies are implemented and farmgate prices become truly border equivalent prices, cotton and rice are likely to continue to become substantial export earning crops.

5. POLICY REFORM IMPACT ON AGRICULTURAL FOREIGN TRADE

By the 1980s, a serious economic crisis became aggravated in Egypt. This crisis arose from the structural deficiencies in terms of internal and external financial imbalance such as deteriorating terms of trade, increasing balance of payment deficits, increasing budget deficits, and deflation of external services. So, the government put in place the structural adjustment program in order to improve the balance of payments. The main policy instruments used in the adjustment program have included exchange rate adjustment, control of money supply and credit, trade liberalization, and deregulation of prices of goods and inputs. This section focuses on measuring the impact of policy reform on agricultural trade policy through comparison of changes in 6-year averages of two period 1980-1985 and 1986-1991 for the quantity and value of exports and imports of major crops, namely, cotton, rice, wheat, maize, and sugar.

Data on the quantity and value of exports and imports for the previous crops from Central Agency for Public Mobilization and Statistics (CAPMS) are presented in Tables 5.1 and 5.2 in nominal and deflated terms, by using API. The tables also present average quantities and values for the 1980-1981, 1980-1985, 1990-1991 and 1986-1991 periods, and the percentage change in the reform period relative to the pre-reform period.

The data show that wheat and sugar imports increased substantially in both quantities and values, while maize imports decreased due to increasing domestic production. For exports, the data show that rice exports increased while cotton exports declined as a result of decreasing domestic production due to falling productivity. In real terms, the value of exports and imports continued to decrease for all crops.

Decline in real total value of cotton exports is due to a decline in production and quantity exported even though there was a small positive growth in the real price (real value/quantity). For rice, however, a decline in real total export value was reversed in 1990/91 because of a larger export quantity. In 1990/91 the total export value of rice was 220% more than in 1988/89; LE 17,393,000 compared to LE 5,436,000.

Imports of wheat increased by 29% during 1990/91 to 4,286,166 MT from 3,322,340 MT in 1988/89. The decline in real value is because of the decline in real price (which, in part, may be due to concessional sales). Decline in the real value of maize imports was due to a decline in real price and some decline in quantity imported in 1991.

Falling real world food prices (wheat, maize, and rice) is a reflection of excess food supplies in the world markets which already seems to have slowed down the world demand for fertilizer as reflected by excess supplies and falling international prices during 1993.

6. FERTILIZER MARKETING REFORMS 1989-1993 AND FERTILIZER SUPPLY

6. INTRODUCTION

An integral part of the continuing national economic and agricultural sector policy reforms, started in 1985/86, have been the reforms directly affecting the supply, distribution, and marketing of fertilizer, pesticides, and other agricultural inputs. Progressive fertilizer sector policy reform implementation since 1989, still continuing at the time of this study, is creating an open, competitive marketing system in the private sector, responsive to market forces, the needs of farmers, and entrepreneurial efficiency. This section of the study provides a chronological listing of the reforms affecting fertilizer marketing and describes the evolution of the fertilizer supply system over the past 4 years. Evolution of the marketing system and the impact of the reforms on involved parties are analyzed in subsequent sections; and recommendations, required to address certain constraints to the development of an open competitive market, subsequently follow.

6.1 POLICY REFORMS

The following policy reforms, summarized in Table 3, directly affecting the fertilizer sector were enacted during the period 1989-1993.

1. Direct subsidy payments to the fertilizer production companies ceased in January 1989. All fertilizer subsidies were then channeled through the PBDAC as direct payments covering the difference between administered retail prices less distribution, marketing, margin, and procurement costs.

2. Direct fertilizer subsidies were subsequently progressively removed or, in the case of potassium sulfate, substantially reduced by July 1991 (Table 6.1.1)

3. A 5% general sales tax, in addition to a 2% commercial tax, was applied to ex-factory prices of fertilizers under Decree 180 in July 1991.

4. The PBDAC monopoly on fertilizer distribution was rescinded in 1989 and the PBDAC initiated a pilot program in 14 districts for cooperatives to undertake fertilizer distribution responsibilities.

Table 3. Fertilizer Marketing Reforms – Egypt

BEFORE	AFTER 1988	IMPACT
Direct production subsidies to factories.	No direct production subsidies after January 1989	Nominal ex-factory prices increased by 143% to 295%. Average nominal retail prices increased by 66.5%
Indirect energy subsidies production companies	Progressive removal of energy subsidies by 1993	Production costs increased by 84% for N and 50% for P_2O_5 between 1988/89 and 1991/92
Direct fertilizer subsidies paid to PBDAC	All subsidies removed by July 1991 except Potassium Sulfate	Average nominal retail prices increased by 49% in 1991/92
No sales taxes were applicable on fertilizers	A 5% general sales tax and 2% commercial tax applied July 1991	Nominal average retail prices increased by a further 7%
Ex-factory prices administered	Ex-factory pricing autonomy	Cost plus pricing or border equivalent pricing for urea and AN
PBDAC distribution monopoly	EAO distribution in 1989	Direct participation by coops in fertilizer retailing
	Private sector distribution July 1991	Factory lifting contracts started PBDAC lifted 58.5% EAO and Coops lifted 19.6% Private sector lifted 21.8%
	PBDAC withdrew from factory liftings in July 1992	PBDAC sold 2.7% to December 1992 EAO and Cooperatives sold 19.9% Private sector sold 77.4% Number of distributors declined 1,000 private licensed dealers Some spot shortages reported
Preferential exchange rates for imports	Full market exchange rates by July 1991	Increased cost of imports
PBDAC monopoly on imports	Imports liberalized in July 1991	Limited private sector imports
5% import tariff on fertilizers	30% import tariff on N and P_2O_5 fertilizer from July 1991	Protection provided to domestic factories and limitations imposed on private sector imports
Official fertilizer allocations	Freedom of choice for farmers from July 1991	Consumption fell in 1991/92 N by 12.2%, P_2O_5 by 33.17% and K_2O by 24.1%; 16.2% overall In 1992/93 overall use increased by 28% based on first 6 months Nitrogen product mix shifted away from AS and CN.
Subsidized credit in kind	Unsubsidized cash credit	Reduced credit use
Public Sector factories	Factory management autonomy as first step to privatization	Reduction in phosphate prices in 1992 in response to market forces Non-competitive pricing of AS and CN Future liberalization of transport

5. The Egyptian Agricultural Organization (EAO), a parastatal vegetable seed production, procurement, and distribution agency of the MALR, was requested to distribute fertilizer from domestic factories to cooperatives in 1989.

6. The PBDAC pilot program for cooperatives was expanded in 1990/91 to cover 41 districts, predominantly in Lower Egypt.

7. Permission was given late in FY 1990/91 for small quantities of urea to be lifted from the Abu Qir factory by a limited number of private sector companies for distribution to vegetable producers.

8. The ban on sales of fertilizer from domestic factories to the private sector was rescinded by decree in 1991, together with the restriction on intergovernorate movement of fertilizer by any organization other than the PBDAC or EAO.

9. Private and cooperative sector participation in factory liftings was allowed from July 1991.

10. Production factories were provided the autonomy to set ex-factory prices for fertilizers at a level commensurate with profitable operation in July 1991 and USAID requested that ex-factory prices be set within 10% of border equivalent prices.

11. Indirect, implicit subsidies for fertilizer producers were progressively removed from 1989/90 by increasing the costs for natural gas, electricity, and fuel oil towards market rates by 1992/93.

12. The preferential exchange rate for fertilizer imports, (US $1.00:LE 0.7 prior to 1988), was progressively increased in 1989 and 1990 and set at the full market rate in July 1991.

13. The importation of fertilizers by the private sector was allowed from July 1991, at which time a 30% import tariff was introduced for all nitrogenous and phosphatic fertilizers.

14. Official fertilizer allocations, based on MALR crop fertilizer recommendations, were no longer used after 1990/91.

15. The PBDAC subsidized crop production credit was limited to five strategic crops in 1990/91 and subsidy limited to the 1989/90 level. All other crop production credit was provided at market interest rates.

16. Crop production credit for fertilizers, formerly provided in-kind, was provided in cash from July 1991 and at unsubsidized, commercial interest rates, except for five strategic crops – cotton, rice, sugarcane, sugar beet, and maize.

17. Subsidized crop production credit interest for all strategic crops, except sugar, ceased in July 1992. Commercial interest rates then applied.

18. In July 1992, the PBDAC essentially stopped factory liftings, taking only 41,700 tons of AN between July and December, 1992.

19. A 1992 decree issued by MALR banned the use of urea on cotton for the 1992 crop season.

20. New Boards of Directors for the fertilizer production companies, involving external private sector parties, were announced in July 1992.

21. Four fertilizer production companies were transferred from Chemical Industries Corporation (CIC) to other holding companies of the Ministry of Industry in February 1993.

22. Abu Qir Fertilizers and Chemicals was formerly offered for privatization in March 1993.

6.2 DEVELOPMENT OF DOMESTIC FERTILIZER SUPPLY

Egypt's long established fertilizer production companies are all in the public domain and until very recently were under the overall coordination of the CIC, a Ministry of Industry holding company. A summarized list of production units, capacities, and recent production performance for the six companies is presented in Table 6.2.1. Following conversion of the three calcium ammonium nitrate (CAN) production units to ammonium nitrate (AN) during the early 1980s, the most significant recent change in domestic nitrogen capacity was the commissioning of the Abu Qir AN plant in 1991 (730,000 mt/annum) and the January 1993 commissioning of El Nasr (Suez) ammonia plant (132,000 mt/annum). An additional AN plant, with a capacity of 330,000 mt/annum, is currently under construction and due to be commissioned later in 1993 at the El Nasr Suez site.

Essentially, domestic urea and AN production (except from the high cost Kima and Helwan plants) is economic by international standards in spite of high employment levels and past accumulated debts. The Kima AN plant, with nitrogen production based on energy inefficient electrolytic conversion, is not cost effective. Its conversion to make use of natural gas feedstock or imported ammonia, combined with improved energy efficiency and increased capacity are possible long-term remedies that are urgently needed.

The domestic nitrogen industry's average production of N between 1982/83 and 1990/91 was 671,000 mt/annum and accounted for 88% of average domestic consumption. The total supply was augmented by imports of ammonium sulfate (AS) and AN (Table 6.2.2). With the commissioning of the fifth AN plant in 1993, annual domestic N supply will increase to 1,035,000 mt/annum, slightly exceeding estimated total N demand.

The domestic phosphate industry, three single superphosphate (SSP) plants, one concentrated superphosphate (CSP) plant, and one small (100 mt/day) pilot, slurry granulation, triple superphosphate (TSP) plant, when CSP production commenced averaged 187,737 mt P_2O_5/annum production between 1985/86 and 1990/91, 2.7% above the average annual domestic consumption. Prior to 1985/86, total supplies of P_2O_5 were supplemented with imported TSP. The phosphate industry has been disadvantaged by poor quality supplies of phosphate rock. Significant investments have been made by Abu Zaabal in phosphate rock beneficiation to improve final product quality. In spite of this, both SSP and CSP are below standard at 15% and 37.5% P_2O_5 respectively, compared to 18% and 46% P_2O_5, respectively, for international specifications. Small trial production runs of TSP have been produced to international standards. In addition to their low nutrient analysis, neither SSP nor CSP fertilizer is granulated.

6.2.1 Impact of Policy Reform on Factory Liftings

Until 1989/90 the production companies were able to maximize production without regard as to whether the production could be sold; the PBDAC accepted all production or it was exported. Fluctuations between demand and supply were absorbed by the large inventory held by the PBDAC. The minor quantities of factory liftings by the EAO and the cooperatives between 1989/90 and 1990/91 did not affect this situation, although El Nasr exported 60,000 and 55,000 mt urea, respectively, in these years. Changes occurred suddenly in July 1991. Private sector companies, apex cooperatives, and later governorate and district cooperatives, with cash collected from farmers or with bank guarantees, were able to purchase fertilizer from the factories and the PBDAC restricted its liftings to meet USAID tranche agreements.

The factories, now faced with a non-guaranteed schedule of monthly liftings and in most cases having a limited amount of product storage, needed to react quickly to prevent cutbacks in production. Although the reactions varied from factory to factory, in general the following actions were taken:

(a) Ex-factory prices were set for all lifting parties.
(b) Lifting contracts were negotiated with both the public and private sectors, stipulating monthly lifting tonnages.
(c) Liftings of some products were tied in fixed ratios to other products (e.g. 2 tons of AN to each ton of urea at Abu Qir, CN and AS tied to AN and urea sales at El Nasr).
(d) Initially, lifting contracts were tied to deliveries in specified governorates; a requirement that was abandoned within a few months.
(e) All sales were for cash.
(f) Discounts of 2% were provided for adherence by lifters to the contracted quarterly tonnages. In the case of El Nasr, penalty clauses of LE 5.00/mt for non-lifting were incorporated into the contracts, although it is unknown whether such penalties were ever enforced.
(g) Contract prices for liftings included commercial and general sales taxes for the private sector but only general sales tax for the public sector and cooperatives.

(h) In some cases, cooperatives demanded and received a 5% commission discount. This commission had traditionally been available to cooperatives throughout the PBDAC monopoly period.

(i) All sales were made on a delivered price basis perpetuating the previously PBDAC-administered transport price equalization system.

Abu Qir signed the largest number of contracts (Table 6.2.3) with the private sector and Kima was the most reliant on the public sector (EAO) for liftings. Due to falling domestic demand, and possibly to a combination of continued PBDAC imports of AN and AS with inconsistent lifting performance of cooperatives and some smaller private sector parties, excess supplies of urea, ammonium nitrate, and phosphatic fertilizers forced the companies to increase exports to clear stocks during 1991/92 (Table 6.2.2). There were several instances of cooperatives selling to non-members, gaining benefits from their commercial tax exemption and, in some cases, the special commission discount. Many of the small private sector lifters only distributed fertilizer within close vicinities of the factories located in the Delta.

From the experience gained in 1991/92, production companies took several actions for 1992/93:

(a) Minimum contract tonnages were generally increased.

(b) The number of private sector lifting contractors was reduced.

(c) Tied sales were either eliminated or the ratio of urea to AN reduced to 1:1.

(d) Sliding scale volume discounts of up to 5% were introduced.

(e) Seasonal discounts of 2% were introduced for the September-December period.

(f) Cooperatives were generally refused any special commission discount.

(g) Encouragement was given by Abu Qir for smaller wholesalers to form informal buying groups (unions) which contracted as single parties. Six of these unions, each comprised of between four and six wholesalers, were formed.

(h) The El Nasr Company introduced terms for credit sales ranging from 15 to 60 days, depending on product and, as an alternative to seasonal discounts, varied the length of credit terms depending on season.

(i) The PBDAC took no action to obtain factory lifting contracts in June-July 1992 and, later, was only able to secure a contract for 41,700 mt AN from El Nasr.

As a result of these changes, there was a considerable concentration of liftings in the hands of only a few private sector companies or unions (Table 6.2.4), but the further development of private sector distribution networks and increased demand for nitrogen, particularly AN, resulted in urea and AN liftings being maintained at production clearing levels for most of the July-December period of 1992. Liftings by the cooperatives again often failed to meet their contractual obligations. Decreased demand for CN, SSP, and particularly CSP (Table 6.2.2), led to a buildup of factory stocks for both products. It is believed that this situation is being exacerbated by the concentration of distribution in too few hands for product from both Abu Zaabal and El Nasr, and the use of volume discounts, which provide unfair advantages to a small number of higher volume distributors. A detailed analysis of factory liftings is provided in Section 7.

6.2.2 Policy Reform Impacts on Production Costs and Ex-Factory Prices

Three policy reforms since 1988 have directly impacted on production costs and ex-factory pricing, namely:

1. Removal of direct subsidy payments to factories in December 1988.
2. Increased energy costs towards market prices since 1989.
3. Autonomy in setting ex-factory prices from July 1991.

The impact of these reforms on production costs, ex-factory prices, and margins is presented in Table 4.2.5 and summarized below in Table 4.

When direct production subsidies were removed in late 1988 administered ex-factory prices were increased by between 142% and 301%. In spite of these increases El Nasr for Coke production costs for AS and AN exceeded the new ex-factory prices and product margins were negative. This situation also applied to AS and CN production at El Nasr's Suez factory. In addition, all of the phosphate production costs exceeded the administered ex-factory prices. No changes were made to the ex-factory nitrogen product prices in 1989/90, except for Kima AN which was increased, and losses increased for AS and CN production and for AN production at El Nasr for Coke. However, phosphate product ex-factory prices were increased in 1989/90 by between 32% and 50% which provided positive margins except for Abu Zaabal SSP.

Table 4. Changes in Production Costs and Ex-Factory Prices

Company	Product	Ex-Factory Price Change 1988/89	Production Cost Change 1988/89 to 91/92	Ex-Factory Price Change 1991/92	Ex-Factory Price Change 1992/93	Estimated 1992/93 Production Cost as % of Border Price
Abu Qir	Urea	41.77%	85.08%	9.09%	7.14%	83.75%
El Nasr	Urea	45.92%	48.57%	5.26%	10.25%	65.00%
Abu Qir	AN	NA	NA	NA	3.95%	103.85%
El Nasr	AN	122.94%	76.69%	68.59%	31.18%	75.69%
Kima	AN	191.98%	126.83%	5.00%	13.55%	133.40%
El Nasr for Coke	AN	279.37%	34.38%	0.00%	0.00%	138.50%
El Nasr	AS	301.23%	41.79%	27.16%	7.12%	119.70%
El Nasr for Coke	AS	251.85%	34.98%	30.34%	6.20%	167.12%
El Nasr	CN	223.12%	91.78%	39.75%	5.53%	194.70%
Abu Zaabal	SSP	213.91%	41.27%	-4.37%	4.00%	105.00%
Kaf'r El Zaiyat	SSP	185.63%	54.24%	0.00%	-0.95%	107.36%
Abu Zaabal	CSP	234.30%	25.76%	-5.00%	-7.89%	124.50%

Between 1989/90 and 1992/93 there were substantial increases in the cost of natural gas (+170%), electricity (+40%), and fuel oil (+63%). With other cost increases, on average, total production costs increased from 1989/90 to 1991/92 by 84% for nitrogen products and 50% for phosphate products. The largest cost increases were for Kima AN production (+127%) and for CN (+92%) and for Abu Qir urea production (+85%).

In 1990/91 both Abu Qir and El Nasr were allowed to sell small quantities of unsubsidized urea and the ex-factory prices were set at LE 385/mt and LE 380/mt respectively, an increase of 83%. After July 1991, when factories were given autonomy to set ex-factory prices, Abu Qir and El Nasr used export realizations of urea and AN as bench marks for domestic prices. Urea prices increased by 9% and 5% respectively from Abu Qir and El Nasr above the previous year's unsubsidized prices. The AN price set by Abu Qir of LE 380/mt, based on export realizations, enabled El Nasr to increase its ex-factory price by almost 70% and then by another 30% in July 1992. With lower capital charges than Abu Qir for both urea and AN the increased ex-factory prices enabled El Nasr to obtain substantial margins on both products.

With the more cost-efficient Abu Qir and El Nasr AN plants setting market prices, the higher cost (Kima and El Nasr for Coke) AN plants have been unable to raise ex-factory prices, resulting in substantial losses on full unit production costs (Table 6.2.5).

Ex-factory price for the El Nasr direct acidulation AS plant was raised 27% in July 1991 to cover the increased full unit production costs and a further 7% in July 1992. This is imposing an indirect tax on the farm sector. The by-product El Nasr for Coke plant, unable to raise its ex-factory price to match the El Nasr price due to lower product quality, is losing money on a full unit production cost basis, although the unit losses have been reduced since 1989/90 (Table 6.2.5).

CN ex-factory prices were increased by 40% in July 1991 and a further 5.5% in July 1992. CN production was maintained at approximately full capacity until 1992/93 (Table 6.2.2) despite an increase in full unit production cost of 92% from 1989/90 to 1991/92, and only a 67% increase in the ex-factory price (Table 6.2.5). Consumption of CN, declining slightly each year since 1987/88, fell by 23% in 1991/92 and a further 33% in the first 6 months of 1992/93 (annualized). Domestic deliveries in 1992, July to December, fell by 54% (annualized) and the production rate has now been curtailed to 25% of capacity. In spite of this situation, the ex-factory price has not been reduced as margins have remained negative.

On a full cost basis urea and AN production by Abu Qir and El Nasr are profitable at current ex-factory prices but AN production by Kima and El Nasr are very unprofitable, as is production of both AS and CN. The estimated production costs for 1992/93 (with an assumed 5% increase in total unit production costs over the previous year) are compared to border equivalent prices in Table 4 by expressing them as a percentage of the border equivalent prices. AN production costs at Kima and El Nasr for Coke are 33% and 38% higher than the border prices. While no detailed cost data are available it would appear that both these plants could be operated on a sunk cost basis. A similar situation exists with the El Nasr AS plant but the El Nasr for Coke AS production cost is 67% higher than the border price and it is unlikely that this could be operated on a sunk cost basis. CN production costs are almost double the border equivalent price and there is no way that this plant can be operated on a sunk cost basis. It may be possible to economically convert this to AN production.

The SSP and CSP situation changed in 1989/90 when substantial increases were made in ex-factory prices of between 32% and 50%, varying between product and source. Increased costs of power and fuel in 1990/91 (reducing implicit subsidy), plus other cost increases, led to phosphate production costs increasing by between 7% and 25%, and ex-factory prices by between 1% and 25%. CSP production fell 20% during the year, increasing unit production costs. In 1991/92, in spite of freedom to set ex-factory prices at a profitable cost plus level, SSP and CSP ex-factory prices were reduced because of the falling domestic use. More importantly, domestic deliveries of P_2O_5 fell by 21% (Table 6.2.2). This move towards market clearing prices was insufficient; stocks accumulated and CSP full production costs exceeded revenues, while SSP margins over full production costs were substantially reduced. Minor quantities of SSP and TSP were exported. During the first 6 months of 1992/93, the supply situation deteriorated; SSP production declined 37% on an annualized basis, and the phosphoric acid plant has been temporarily closed after production of 48,000 mt CSP and 6,000 mt TSP (for export) and domestic deliveries of only 4,079 mt CSP.

No production costs are available for 1992/93, but as shown in Table 6.2.5, with an assumed 5% increase in total unit production costs over the previous year, all phosphate product ex-factory prices are below full unit production costs. An encouraging sign, however, is that domestic deliveries and total consumption of SSP during the first 6 months of FY 1992/93 had increased (on an annualized basis) by 18% and 30% respectively, indicating that current ex-factory prices are approaching market clearing rates and this will reduce unit production costs. As SSP production costs are estimated to be only slightly in excess of border prices, increased capacity utilization should enable production to be profitable on a full cost basis. CSP production costs are estimated to be 24% above border price and a sunk cost operation is possible.

6.2.3 Other Domestic Supply Changes

One of the most significant changes that has occurred in domestic production, indirectly as a result of policy reform inducing interfactory competition, has been a vast improvement in bag quality. Prior to the reforms poor quality bags, poor heat sealing, and resultant product losses were a major problem. Attractive, color coded bags of superior quality polyethylene have greatly assisted in reducing losses and allow for ready product identification by dealers and farmers.

The competitive market situation has also created price differentiation between similar products (Abu Qir's AN is attracting a premium in the market) and increased efforts to improve product quality and service. El Nasr is due to add a conditioning agent to its AN production; Abu Zaabal is trial marketing 25-kg bags of granular CSP; the Egyptian Fertilizer Development Center (EFDC) is investigating the production and agronomic effectiveness of new products such as urea ammonium nitrate solution (UAN) and compound NPK fertilizers. All production companies have plans for improving process efficiency. The conversion of the Kima plant to natural gas, or alternatively to enable the use of imported ammonia feed-stock, is being considered.

Some excursions into market development and market promotion have also occurred. El Nasr has run promotional television advertisements; Kafr El Zaiyat has produced and distributed point of sale posters for retailers; and Abu Zaabal has conducted field demonstrations on responses to phosphorus.

While these companies remain in the public domain, even though being given autonomy and responsibility for profitable operation, their major role remains to produce at full capacity at the lowest possible unit cost. Forays into market development can provide opportunities for additional costs to be incurred which are ultimately passed on to the farm sector. While product promotion will be a legitimate role of the production companies once they are privatized, for the present, this role should be left to the private sector distributors and wholesalers.

6.3 IMPORT SUPPLY

The contradictory policies of imposing a 30% tariff on nitrogen and phosphate fertilizers and, at the same time, allowing private sector imports is a constraint to the participation of the private sector in import supply. Since the policy changes in July 1991, only small quantities of AS and calcium ammonium nitrate (CAN) have been imported by the private sector. Several small parcels of AS (a reported total of 20,000 mt) have been imported. Importations of small quantities are usually inefficient and costly but no cost data have been located. One international fertilizer company imported a trial shipment of 6,000 mt of CAN in 1991/92. Private sector imports of soluble NPKs for drip irrigation (previously imported by PBDAC but distributed by the private sector) have continued at an approximate rate of 4,000 mt/annum. These products retail for between LE 3,000 and LE 4,000/mt. In addition, one private sector company, developing a market for blended NPK fertilizers, has imported granular TSP, AN, and other high-quality ingredients suitable for blending. These quantities have not been very large and the resultant NPK blends, which retail for between LE 600 and LE 800/mt, have yet to establish a substantial market niche. Import licenses cost 0.01% of import C&F value.

The PBDAC continued to import AS and AN through 1991/92, totaling almost 154,000 mt N, while N exports during the year amounted to almost 183,000 mt (Table 6.2.2). The PBDAC then ceased importing N fertilizers until it called international tenders for 100,000 mt AN and 279,000 mt AS in the first quarter of 1993, causing uncertainty as to its intentions among both domestic producers and private sector distributors. At the time of this writing, the PBDAC is reportedly moving ahead with the AS importation to satisfy perceived needs of rice and vegetable producers and, possibly, to force down the ex-factory prices of domestically produced AS.

The PBDAC continues to import potassium sulfate (KS) and distribute it through its own distribution network. It is currently sourced from Germany and it was reported that German aid funds of 30 million DM were available for this activity. Uncertainty over the ability to ship from Black Sea ports, due to internal distribution and port congestion problems in Russia, was also a factor in the decision to secure supplies from Germany. The current cost of KS is US $230.00 C&F/mt. Potash imports are subject to a 5% tariff and the landed cost bagged ex-Alexandria is LE 922.00/mt (Table 6.3.1). With a distribution and marketing cost of almost LE 80.00/mt and a retail price of LE 380.00/mt, there is a direct subsidy of LE 620.00/mt or 62%. In spite of this continued level of subsidy, the price increase of 560% since 1988 has caused consumption to fall from 80,000 mt/annum to 20,000 mt for the first 6 months of 1992/93.

The off-loading and bagging system at Alexandria port and its cost (Table 6.3.1) remain essentially unchanged from the PBDAC monopoly period. There is no element of competitive service and both the PBDAC and private sector must use whatever services are made available.

6.4 EX-FACTORY PRICING

6.4.1 A Rationale for Ex-Factory Pricing

Policy for ex-factory pricing is in the public domain. Thus, delegation of responsibility for factory-gate pricing of fertilizers, thus should be guided by explicit criteria derived from the agricultural pricing policy objectives. In Egypt since 1986 these objectives have advanced rapidly toward eliminating discrimination against agriculture. Such a situation would exist if farmers confronted and responded to relative prices prevailing internationally. Most agricultural outputs and inputs are traded in the world markets; domestic resource allocation, therefore, must be such that a maximum international value with open export and import trade is obtained. Domestic prices of agricultural commodities and tradable inputs, therefore, should be comparable to prices for which they can be bought and sold in the international market. Such a situation is consistent with minimization of tax (implicit and explicit) on agriculture and maximization of its contribution to growth of the economy. Factory-gate pricing of fertilizer, therefore, should be guided by a border-equivalent pricing principle. Discussion of ex-factory pricing can be facilitated by focusing on nitrogenous and phosphatic products.

6.4.2 Nitrogen Product Pricing

The Abu Qir company produces urea and AN and is suitably located for export as well as for supplying the domestic market. The production plants are modern and have economies of scale. Both products are of an excellent quality and have an attractive export as well as domestic demand (selling at a premium in the domestic market). The company has a small history of exporting both products during the recent past. It is our understanding that both these products are attractive for the European countries. The questions to be answered are: How much of each product to export? When to export? What prices to charge the domestic market?

Since the company has already been exporting urea and AN, the FOB export prices for these products are available. The border equivalent prices are then simply derived by making adjustments for the difference in costs of bags used for domestic and export markets and for the costs of making FOB sales. The remainder should be the ex-factory gate prices for these two products at this location; to be lowered during low demand months and to be raised during peak demand months, such that the average, weighted by the monthly sales, does not diverge from the price as derived above.

Exports of these two products from this factory should take place if the domestic market, at fixed prices derived as above, does not lift the entire factory production.

The principle of varying the monthly price around the weighted average is important. It enables the company to avoid holding inventories if there is no export demand. Monthly prices should be announced well in advance as a signal to the domestic distributors to plan their buying.

Sales should be made only for cash. Factories have no economic reason to supply credit to the distributors and credit facilities can be favored toward or against individual distributors.

Urea and AN from the El Nasr Talkha plants are of a lower quality. This company therefore has to price these products in competition with Abu Qir, but must produce at full capacity and should not accumulate stocks. Exports should be made when the domestic market fails to clear production at border equivalent prices (adjusted for quality). The other AN plants must sell their production in competition with the main producers at the market determined prices. The Kima plant is at a decided disadvantage in this regard. Not only are the production costs high, but the freight equalization system practiced in Egypt places AN produced at Abu Qir and Talkha into Upper Egypt at a freight cost of LE 22.00/mt. If actual freight costs were used, the transport cost to Upper Egypt would be between LE 30 and LE 40/mt. This would increase the Kima plant's border price equivalent and allow more profitable operation of this plant.

The AS and CN plants are old. They have long since been paid for. At the full cost pricing currently in force, the CN plant is unable to sell its full capacity production. The small AS plants are clearing their full capacity production but mainly because there have been no AS imports in the past year. It is in the interest of Egypt that these companies continue to operate at full capacity and price the products so that they do not accommodate stocks and incur inventory costs, so long as they recover their operating costs. These products will not sell at full cost pricing.

Table 6.4.1 illustrates calculations made of border equivalent prices for the nitrogen products using Egypt's international market prices in the past year. Comparing the export realizations for urea or the expected import cost for AS with international market prices in 1992 (Table 6.4.2), it is seen that Egypt's international urea price is approximately equal to the Middle East urea price but is above the East European urea price. East European urea is, however, generally of a lower quality than Egyptian urea. No international market prices are quoted for AN in Table 6.4.2 as most international trade in this product is conducted in Western Europe, the market where export sales of Egyptian AN are made.

The current ex-factory prices for urea and AN are in line with the estimated border price equivalents, but they do contain a small percentage increment over these indicating a degree of taxation to the agricultural sector. AS and CN domestic prices are 35% and 43% above border equivalent price estimates. These domestic prices need to be reduced to border price equivalent levels, which may approximate market clearing prices and the full production capacity utilized.

6.4.3 Phosphatic Product Pricing

The border price equivalents for CSP and SSP are also presented in Table 6.4.1. As neither of these products are traded internationally the estimates are based on imported, granular TSP, with adjustments made for nutrient content (P_2O_5), and granulation. The import price quoted, US$ 180.00/mt CIF, was an actual cost incurred for a small shipment imported by a private sector importer for Tunisian sourced product in 1992. As such, it probably represents a slightly higher cost than could be obtained for larger shipments (compare, for example, with the North African TSP FOB prices in 1992, Table 6.4.2).

As described earlier, the domestic prices for phosphatic fertilizers have been reduced. The CSP price is now below the estimated border price equivalent, but based on the sales volume for the 6 months to December 1992, it is still above a market clearing level. However, as its price per kilogram P_2O_5 is below that of SSP, it is believed that restricted availability, due to a small number of distributors lifting, is a factor in the very low volume of sales recorded. The reduced domestic SSP price is incurring a small (2.7%) premium above its estimated border equivalent price. The price should be reduced further to a market clearing level, provided this is greater than operating costs. Domestic phosphatic fertilizer production is an import substitution industry, and domestic price levels above import border equivalent costs act as a tax on agriculture.

6.5 OPEN MARKET COMPETITION AND FACTORY CONTRACTS

A limited number of distributors and market channels for the distribution of fertilizer is not conducive to providing adequate coverage of, and competition in, the market. Single distributors being responsible for almost 50% of individual plant production limit the accessibility of dealers and farmers to those products. One distributor, serving only 30 dealers, is responsible for the distribution of almost 20% of the CN while another is responsible for a further 25% of the aggregate liftings. It is considered that this concentration is acting as a deterrent to the full distribution and market potential of some products, in addition to reducing competition.

Although the response of the production companies to the larger number of dealers, many with indifferent lifting performance, in 1991/92 was to select the better performing dealers and distributors for 1992/93, by increasing minimum contract volumes or providing large individual contract volumes, such actions are not in the best interests of developing a competitive market. It is therefore recommended that maximum contract volumes should be applied for a period of 2 years to encourage the entry and development of more national and regional distributors.

6.6 PRIVATIZATION OF PRODUCTION COMPANIES

The rationale for ex-factory pricing for the public sector production companies would also apply if these companies were privatized. Maximizing capacity utilization to reduce unit production costs is standard operating procedure for private sector fertilizer companies. If, and when, domestic market demand or international demand at full production cost pricing is insufficient to clear all production, then private companies temporarily use variable cost pricing until either international market prices increase or domestic demand at full cost prices is sufficient to clear production. This is a situation that has occurred persistently during the past decade in the fertilizer industries of Western Europe and North America.

In privatizing existing public sector fertilizer companies, asset valuation (on either a replacement or a sunk cost basis) cannot be realistically used. The valuation of an existing fertilizer company is dependent on the discounted cash flows that can be expected by potential investors, with expected market clearing prices. These cash flows can be influenced by both additional efficiency investments and the removal of public sector restrictions, such as mandatory employment levels. In view of the current moves towards privatization of the production companies in Egypt, it is recommended that an investigation or study should be commenced to provide the GOE with guidelines for the valuation of these companies.

7. POLICY REFORM AND MARKETING SYSTEM DEVELOPMENT, 1989-1993

7. INTRODUCTION

Following the initial changes to the PBDAC distribution monopoly in 1989, the EAO, a parastatal vegetable seed production, procurement, and distribution agency of the MALR, conservatively initiated its fertilizer factory liftings with 50,000 tons urea from the Abu Qir factory. The EAO operated as a distributor-broker for both Agrarian Reform and Multi-Purpose Cooperatives retaining for itself a margin of 2% (equivalent to its commercial tax exemption). In 1990/91, the EAO expanded its factory liftings to the Talkha and Kima production companies with contracts for lifting 50,000 tons each of urea and AN from both Abu Qir and Talkha, plus 50,000 tons AN from Kima. The actual quantities distributed by the EAO are not known. Five private sector companies were given special permission to lift approximately 50,000 tons urea from Abu Qir in 1991.

After July 1991, when all direct subsidies for domestically produced fertilizers were removed, private sector participation in fertilizer distribution commenced in earnest, although the PBDAC remained as the main distributor. In July 1992, the PBDAC, having created a private sector company (El Gharbiya Company), did not initially participate in factory lifting contracts, although it later lifted 41,700 tons AN from Talkha. The following description and assessment of the distribution developments focus, therefore, on the 2 years 1991/92 and 1992/93.

7.1 DEFINITIONS

Any organization signing a lifting contract has been commonly called a factory agent, although the term is applied primarily to private sector companies. This is misleading. None of these organizations act as agents for the production companies. Throughout this report the following definitions are used.

Distributor – An organization primarily engaged in lifting fertilizer from the factories and distributing it to wholesalers and/or retailers. Some participation in actual retail sales to farmers may occur through owned retail outlets.

Broker – A distributor acting as a facilitating agency between wholesalers and the factories but not participating in retail sales or the development of distribution networks.

Commission Agent – A regional or local agent for a distributor or broker collecting and compiling wholesaler or retailer orders in return for a small commission fee.

Wholesaler – A buyer from a distributor or broker of a complete range of fertilizers into inventory for assembly and sale to retailers. Wholesalers may also participate in retail activities (wholesaler/retailers), which is the usual case in Egypt.

Retailer – A buyer from a wholesaler selling direct to farmers, usually from a small store with some limited storage facilities.

Participatory Retailer – A part-time retailer entering into the market system only during peak demand periods or when other profit opportunities arise, usually with no store or storage facilities.

Dealer – A collective term for wholesaler/retailers and retailers.

Market Channel – A separate distribution system between supply source and end-user (e.g. the PBDAC, the EAO to cooperatives to members, distributor to cooperatives to members, distributor to dealers to farmers)

In Egypt, a system has developed over the past 2 years in which there are few clear demarcations between the marketing system participants, particularly between the wholesale and retail functions. Also, both wholesalers and distributors participate in factory liftings, with or without contracts.

In September 1992 a limited survey of farmers, distributors, and dealers was conducted by the MALR as part of the Agricultural Production and Credit Program (APCP). Information was collected in reference to fertilizers for the summer crop season 1992 (January to June). A selection of the relevant unpublished survey data is used in this study to illustrate and confirm findings.

7.2 DEVELOPMENT OF DISTRIBUTORS

The development of private sector distributor numbers between 1989 and 1993, described in Section 6, is supplemented here by more detailed information on all factory liftings in 1991/92 and 1992/93. In 1991/92 the PBDAC contracted for 1.139 million tons, 47% of the aggregate factory contracts of 2.449 million tons (Table 7.2.1), the EAO 7%, and the cooperatives 19%; a total of 73% for the public and cooperative sectors. There were distinct differences between factories and products in the role of the private sector liftings (urea and AN dominated private sector liftings). The actual liftings, as opposed to contracted volumes, were different (Table 7.2.2) with the PBDAC lifting 58.5% of total all factory deliveries (2.625 million tons), the EAO 7%, the cooperatives 12.6%, and the private sector 21.8%. It appears that the reported indifferent performance of the cooperatives in lifting contracted volumes was compensated for by increased liftings of the PBDAC and the private sector, although in Upper Egypt the private sector was slow to get established and the EAO and the PBDAC played the major role in distribution during 1991/92.

Details of 1992/93 lifting contracts are provided in Tables 7.2.3, 7.2.4 and 7.2.5. The reduced numbers of private sector distributors, referred to in Section 6, is quite apparent. In particular, 46.6% and 39.6%, respectively, of all Talkha urea and AN contracted were to one private sector company and 43.5% of all Abu Zaabal SSP to another private sector company. The concentration of liftings with four private sector distributors (Table 6.2.4) in 1992/93, while not a major problem on a total product basis, is not conducive to competition at the individual product or factory level.

During the 6 months to December 1992, the private sector had 76% of urea liftings, 45.3% of AN liftings, 43.5% of SSP liftings, and over 90% of AS and CN liftings. However, during this same period the PBDAC was selling out of its inventory rather than making new purchases, and the private sector share of the total market sales was 77.4%, with the EAO at 15.3%, the cooperatives 4.6%, and the PBDAC at 2.7% (Table 7.2.2). It is anticipated that the private sector will account for about 80% of total distribution for the full year.

Some confirmation of the above market share estimates is provided by the survey results of farmers' purchases for the 1992 summer crop (Table 7.2.6).

Several types of distributors have developed in the private sector: national distributors, regional distributors, brokers, and unions. At least two of the national distributors have established four regional sales offices each. One of these companies, previously engaged in some non-subsidized fertilizer business prior to the reforms, now employs 30 salesmen in addition to four regional sales managers to assist dealers in developing sales plans and delivery programs. Other activities include some market research and market development, and the renting of some PBDAC warehouses for regional inventories. In total, this company supplies approximately 300 dealers, with a higher concentration in the Delta than in either Middle or Upper Egypt. With total sales for 1992/93 expected at 400,000 tons, 25% of the sales are made to cooperatives. Mixed truck loads of fertilizers are an attractive service provided to the cooperatives by this distributor. Another national distributor was previously a pesticide distributor and retailer. This situation is unusual; for the most part pesticide and fertilizer distributors and dealers have developed separately.

Other national distributors are essentially brokers operating out of Cairo, one serves up to 200 licensed dealers and additional unlicensed dealers. Only one national distributor, El Gharbiya, has a contract with Kima. The El Gharbiya Company, established by the PBDAC, has had a short but checkered history. Originally proposed by the PBDAC as a means of transferring staff to the private sector and to act as a competitive channel in the distribution network, this company was established in its current form in July 1992. It had been a PBDAC fully-owned company prior to this, but since 1992 the PBDAC has retained only 22% of the share capital with 40% owned by staff, 10% by the PBDAC Social Fund, and the remainder by various private sector parties. With a staff of only 5 persons, the El Gharbiya Company has not provided many staff transfers for the PBDAC.

In July 1992, the company had a reported total lifting contract of 935,000 tons. The production companies considered it to be a private sector replacement for the PBDAC. However, the new management of the company reportedly attempted to use not only the PBDAC storage facilities but also the BDAC employees in the governorates. This was not an acceptable situation and the company's distribution plans collapsed. Its lifting contracts were mainly reassigned. In the 6 months to December 1992, the company has distributed almost 200,000 tons fertilizer, almost all of which has been urea and AN. The company is operating with commission agents in 17 governorates who collect and coordinate sales from dealers. It has longer term plans to develop its own network of dealers as multi-input (fertilizer, pesticide, and seed) farmer service centers. It is also involved in the importation and distribution of yellow corn.

Regional distributors exist in two forms, private sector companies and unions. The unions, as described in Section 6, were encouraged by the Abu Qir company to be formed as buying groups of wholesalers. Opposition to these unions was recently mounted by other distributors on the basis that they were not legal entities. It is believed that, in the future, the unions may have to establish themselves as legal entities or the participating wholesalers will have to contract with the factories individually. The number and regional affiliations of these unions are reported in Tables 7.2.3 and 7.2.4.

The cooperatives have acted in various ways as distributors. The central cooperative societies, both Agrarian Reform and Multi-Purpose, have contracted with factories either directly or through the EAO. Indifferent lifting performance by the national-level organizations has led some of the central cooperative societies at governorate level to also contract with the factories. This has particularly been the case in Lower Egypt and Upper Egypt (Tables 7.2.3 and 7.2.4), with the Central Gharbiya Society for Credit being particularly active. In addition, cooperatives have purchased requirements from private sector distributors or their members have purchased all, or additional, fertilizer requirements from private sector dealers.

All distributors buy from factories on cash terms except from the El Nasr Company. All sales are made for cash. Details of distributor margins, pricing, and operating costs are discussed in Section 7.4.

7.3 DEVELOPMENT OF DEALERS

In June 1992, there were 646 licensed fertilizer dealers (Table 7.3.1). By December 1992, the number had increased by 38.1% to 892 with a high proportion of the new licenses being issued in Upper Egypt. This later development of private sector dealers in Upper Egypt is considered to be related to the absence of national distributors in Upper Egypt until late 1992 and their absence from factory lifting contracts with the Kima factory.

Using the last available (1990/91) fertilizer sales statistics by governorate, estimates are made of average annual sales per licensed dealer by governorate (Table 7.3.2). Excluding Cairo, El Arish, and New Valley data, these range from a low of 858 tons in Giza to a high of 9,643 tons in Beheira, with an average of 2,318 tons and only small differences between averages for the regions. It should be noted that in the Fayoum governorate there were only 12 licensed dealers with estimated average annual sales of almost 5,700 tons. Over 100 license applications have reportedly been made in Fayoum, but a strict enforcement of building code requirements for storage facilities has apparently restricted the number of successful license applications.

The number of unlicensed dealers has been variously estimated at between 5 and 10 times the number of licensed dealers. These unlicensed dealers are believed to be mainly small retailers or participatory dealers. Using a conservative estimate of 5 unlicensed dealers to each licensed dealer, estimates are presented (Table 7.3.3) of the total number of dealers by region. The estimated total of over 6,000 private sector outlets for fertilizer available to farmers is considered to be a sufficient number in total to ensure an adequate level of competition at the dealer level. There may, however, be some local areas with insufficient outlets, the Fayoum governorate in particular. A diagram is provided (Figure 7.1) to indicate the total structure of the current distribution system.

The limited survey of 92 dealers indicated that during the 1992 summer crop season over 50% of the dealers in Upper Egypt were buying direct from factories or through the EAO. This reflected the lack of national distributors in Upper Egypt at that time (Table 7.3.4). The quantities of fertilizer purchased by these surveyed dealers, by source, are recorded in Table 7.3.5. Obviously, this situation has changed with the reduction in factory lifting agents in 1992/93.

Responses of dealers to questions concerning their source of purchases (Tables 7.3.6, 7.3.7, and 7.3.8) indicate a high level of satisfaction in purchasing from factories (90% wishing to continue), a lower level with EAO (80%), and a very low level of satisfaction with distributors in Upper Egypt (41%), due mainly to high prices.

7.4 DISTRIBUTOR PRICING, MARGINS, AND OPERATING COSTS

As reported in Section 6 and above, except for sales from El Nasr, all factory sales are made on a cash basis. In 1991/92, distributors collected money from dealers, wholesalers collected money from farmers or retailers, and cooperatives collected money from members for fertilizer purchases from the factories. In 1992/93, although cash sales still apply (except for El-Nasr), most distributors operate with the factories using bank guarantees supplied by the PBDAC. Several distributors complained that private banks were not interested in providing such guarantees for fertilizer distribution.

Reliance on the PBDAC for bank guarantees imposes an additional cost for distributors. The Central Bank imposed a restriction on the PBDAC that requires it to secure deposits equal to the full value of the bank guarantees. It is believed that this restriction was imposed to prevent the PBDAC from competing with the commercial banks. The PBDAC has also restricted guarantees for individual companies to LE 20 million as a means of preventing market domination by additional distributors. The bank guarantees required by the distributors are equal to the value of their monthly contracts with the factories and operate as revolving lines of credit security. If, as reported, the commercial banks are not interested in this business, there seems to be little reason why the Central Bank should not allow the PBDAC to provide bank guarantees at normal commercial deposit levels of 10% to 30% of the monthly contract volumes.

Distributors reported that the average discounts provided by the factories are 2% of the ex-factory prices, plus some additional volume discounts and some seasonal discounts. The El Nasr Company reportedly provides its major private sector distributor with a volume discount of up to 5%. This gives this particular distributor an unfair competitive advantage over others. The largest distributor of SSP from Abu Zaabal is currently receiving a discount of LE 10/mt or approximately 5% of the ex-factory price with similar advantageous results.

Distributors claimed that their net profit margins were approximately 0.5% and estimates made of their operating costs and net profit margins using average discounts of 2.5% (Table 7.4.1) indicate the veracity of these claims. The return on investment (ROI) for distributors is dependent on the rate of capital turnover. Calculations made show that ROI increases from about 25% when turnover is once per month to about 100% with a turnover of four times per month. Compared to other recently privatized systems, such as that in Bangladesh, the total distributor margin (that is the difference between the net ex-factory price, excluding freight, and the selling price to wholesalers) is similar. In Egypt the distributor margin is equivalent to 5.7% of the net ex-factory price compared to 4.5% in Bangladesh based on weighted averages for all products. Differences in freight costs account for some of the variation. The total marketing margin - the differences between net ex-factory prices and retail prices - is approximately 10% in Egypt and 13.3% in Bangladesh. Excluding freight costs the margins are 5.2% in Egypt and 8.6% in Bangladesh. Distributor margins are higher in Egypt and retailer margins lower than in Bangladesh.

Seasonal discounts were provided by Abu Qir in September-November 1992 at a rate of 2% to encourage distributors and dealers to increase monthly liftings and hold inventory. The discounts were generally passed on to dealers and sometimes to farmers, but they had little impact on stock building. One distributor, in an attempt to maintain monthly liftings, is offering wholesalers through January-March 1993, a delayed rebate discount in which, for each truckload delivered during these months, wholesalers will earn LE 7.00/mt discount for an equal number of truckloads delivered in the peak period (May-July). This scheme attempts to prevent wholesalers from seeking an increased market share by immediately passing on the cost savings.

A problem persists, however, in that the level of seasonal discounts currently provided is insufficient to cover the cost of holding inventory. The interest cost alone for holding 1 ton of urea for 1 month is LE 8.00 to LE 9.00, depending on location. This is equivalent to a 2% discount on the ex-factory price of LE 450.00/mt. A minimum discount of 2.5% is required for each month of inventory holding by either the distributors or wholesalers to cover costs and provide an incentive for holding inventory. To meet monthly lifting schedules, factories need to encourage distributors and wholesalers to hold inventory for up to 3 months at certain times of the year. A combination of an appropriate level of seasonal discounts (payable on future equivalent tonnages lifted in peak season) would solve both the factory's lifting schedule problems and the current lack of marketplace inventory. In peak demand periods, ex-factory prices should be increased so that the weighted average ex-factory price is equal to the target price level set by the factories. Early publication of a monthly ex-factory pricing schedule is required for successful implementation.

The various time credit terms offered by El Nasr, which are extended in slack demand periods in lieu of seasonal discounts, are not appropriate for a public sector fertilizer company. Such conditions, negotiated with individual distributors, may provide some of them with unfair advantages because the extent of credit provided is dependent on the level of bank guarantees provided.

7.5 DEALER PRICING, MARGINS, AND OPERATING COSTS

In general terms, the study found that private sector wholesalers (in all areas), bought fertilizers at the same delivered ex-factory price, including taxes, that the distributors paid to the factories; the distributor margins being obtained in the form of discounts paid in arrears to them by the factories. Depending on the distributor involved, there is some variation within regions due to the distributors passing on volume and seasonal discounts to the wholesalers. The average wholesaler margin in January-February 1993 appeared to be LE 5.00/mt, irrespective of product. Although the retail margins varied between LE 5.00/mt and LE 10.00/mt, depending on the degree of competition in a given area, and the transport cost from the wholesalers to the retailers, but the predominant retail margin for wholesaler/retailers appeared to be LE 5.00/mt. With most wholesalers also having retail sales, their total average margins vary between LE 5.00 and LE 10.00/mt. Estimated buildup of retail prices for urea and AN is presented in Tables 7.5.1 and 7.5.2 and a summary of prices quoted during the study field trips by location is provided in Table 7.5.3.

With the increase in both ex-factory prices of urea and AN since July 1992 and the increased competition since then, there appears to have been a tightening of wholesale and retail margins compared to the earlier survey results. Table 7.5.4 presents the survey results of distributor prices and margins between January and June 1992 for urea, AN, and SSP and shows total margins as high as 6.4% return on sales. It should be noted that these high margins include the distributor, wholesale, and retail margins. In Table 7.5.5, regional prices and margins are presented for wholesaler/retailers. The consistently higher margins in Upper Egypt reinforce the assumption that the development of increased levels of competition and product availability have reduced dealer margins. Further survey results (Table 7.5.6) of retail prices paid by farmers in the same period reveal average private sector source price premiums above public sector prices of about 4%, but ranging up to 16% for SSP in Middle Egypt. An interpretation of these results is that the high premiums in Middle Egypt are a reflection of the low level of competition in Fayoum governorate and the lack of competition in Upper Egypt. Early data indications from a subsequent survey of the 1992 winter crop period indicate that private sector prices were approximately equal to public sector (essentially cooperative) prices, again reinforcing the argument that increases in competition over the past year has had the effect of reducing margins and retail prices.

Using the information available on ex-factory prices and retail prices, estimates are made of the average retail prices for fertilizers in 1992/93. These are presented, together with past price levels, in Table 7.5.7. The weighted average nominal price per kilogram N increased 43% in 1991/92 and a further 8% in 1992/93; for phosphate fertilizers, the increases were 42% and 0%, respectively.

The limited sample of dealers surveyed in 1992 provided estimates of operating costs (Table 7.5.8). These are confused by local transport costs and possibly also by some factory delivery costs for some dealers lifting from factories in the Delta and Upper Egypt. Without the transport costs, the average of all other costs was LE 2.67/mt. However, financing costs reported were either nonexistent or extremely low, indicating an underestimation of operating costs.

7.6 DEALER CONSTRAINTS TO FERTILIZER MARKETING

Survey data revealed that storage was not a major constraint for dealers (Table 7.6.1). At the time of the survey the PBDAC was considered the main competitor and other private dealers ranked second, while cooperatives were a distant third (Table 7.6.2). Now, with the PBDAC no longer participating in the market, other private sector dealers represent the main competition.

As major problems in selling fertilizer (Table 7.6.3), dealers in all regions listed the lack of financing as the most important constraint (23% of all dealers), except for inability to deal directly with factories in Middle Egypt (40% of dealers in Middle Egypt). This latter problem would have been expected during 1991/92 in Middle Egypt, given that national distributors were in the very early stages of setting up distribution networks. Competition from cooperatives in both Upper and Lower

Egypt was also listed as a problem by 11% of all dealers surveyed. This response was counter to the competition ranking responses, which ranked cooperatives a distant third, behind the PBDAC and other private dealers.

Private capital was the most common source of funds (79% of respondents) and the PBDAC the second source (10% of respondents), although over 50% of applications for PBDAC loans had been refused (Table 7.6.4).

In response to requests for further government action to assist fertilizer business operations, the two most frequent requests were for the facilitating of private sector imports (21% of all dealers) and for decreasing insurance deposits (19%) (Table 7.6.5). It is interesting to note (Table 7.6.5), that in Middle Egypt, the enforcement of dealer licensing requirements was not considered important. This appears to be a further reinforcement of the views expressed with regard to licensing in the Fayoum governorate.

During field visits undertaken for this study during January and February 1993, most of the previous survey findings were confirmed. Some exceptions to this statement, however, include a lack of interest by dealers in importing, possibly reflecting the improved distribution and supply situation as compared to the previous year – and the reduced price premiums of the private sector, compared to the public sector. A qualitative assessment of the emerging marketing system is now presented.

7.7 QUALITATIVE ASSESSMENT OF THE DEVELOPING MARKET SYSTEM

The ability of the private sector to rapidly emerge and dominate fertilizer marketing in Egypt, once the controls on its participation were lifted, is not surprising. The private sector had, prior to the reforms, played a significant role in redistributing fertilizer in an illegal, unofficial, secondary market. Once fertilizer subsidies were removed and fertilizer was freely available, the illegal market completely disappeared. The early disengagement of the PBDAC from factory liftings undoubtedly accelerated and consolidated the private sector's role in 1992.

Only two major market channels have developed – that of the private sector and that of the cooperative sector. The role of the EAO, as a public sector channel, is very much aligned with the cooperative sector, although it participates in some distribution to the private sector. The PBDAC role is now limited to the distribution of potassium sulfate, which is a limited role that is almost certainly constraining the use of this product because farmers have to approach the PBDAC mandoubiahs specifically for it.

The private sector is characterized by the role of the wholesaler/retailers. Many of these were previously engaged in some form of input wholesaling or retailing–either small machinery, pesticides, or vegetable seeds or in the illegal trade in fertilizers. However, most of these are still fertilizer dealers only; although, in the future, it is expected that multi-product dealers will become far more common, due to the low margins available on fertilizers.

Typically, these dealers have warehouses available and separate small retail stores with associated limited storage, located in market town or village commercial areas. With several wholesalers in major centers, there exists a high degree of competition. Usually, they have about five retailers at the village level to whom they sell and deliver fertilizers. The larger wholesalers, usually located in the market towns, may service up to 20 or more retailers in several districts. The retailers are usually located in the villages, operating small stores with limited storage. The participatory retailers appear to sell out of pickup trucks directly to farmers, providing a farm delivery service during peak demand periods for those farmers with land distant from the villages. Most of these small participatory dealers are unlicensed.

The most striking characteristics of the system are the lack of large inventories and the rapid turnover of stocks. This situation is a natural result of the low margins and high interest cost for stock holding. As a result, spot shortages have occurred in the market at peak demand periods.

Deliveries to wholesalers, arranged by distributors or by the wholesalers themselves, are made from the factories in 35-ton trucks. Direct delivery to retailers is therefore limited due to access and storage limitations. Usually, deliveries from wholesalers to retailers are made in 5- to 10-ton trucks or smaller pickup trucks.

The transport and storage restrictions apply also to the village cooperatives. District cooperatives usually have adequate storage facilities and large transport access but many of the district cooperative storages were leased to the PBDAC and only a limited number have been returned to the cooperatives. This may have affected the speed at which the cooperatives have participated in fertilizer marketing in the past 2 years.

All fertilizer transactions in the marketing system are for cash and most dealers have a price list displayed. Product availability is the only service provided to farmers. Most dealers, when questioned about providing advice on fertilizer use to farmers, stated that farmers knew what they wanted and how to use fertilizers. No point of sale technical or advertising materials are available.

7.8 QUALITATIVE ASSESSMENT OF FERTILIZER AVAILABILITY

The private sector fertilizer distribution system is working well. Farmers have more than adequate access to fertilizer supplies from private dealers. During 1992, however, it is obvious that there were frequent spot shortages during peak demand periods and prices increased by up to LE 4.00/50-kg bag (LE 80.00/mt). In part, this was due to the lack of development of national distributors, particularly in Upper and Middle Egypt. However, the decision by Abu Qir to export AN during a peak demand period also compounded the problem, as did the lack of adequate seasonal discounts to allow inventory building.

The concentration of distribution in the hands of a few distributors is also limiting supply availability to dealers. These transitional problems can be overcome and recommendations are made for achieving this. A very satisfactory aspect of the system is the degree of competition among dealers, except in the Fayoum governorate. The fertilizer business is open to any potential participant and no restrictions on trading areas apply. However, a major barrier to legal entry is fertilizer trade licensing. This constraint is dealt with in detail in Section 7.10.

7.9 TRANSPORT COSTS AND COMPETITION

The current practices of freight equalization, as discussed earlier, are restricting competition between transport operators and causing resource misallocation. The use of rail for transport has also declined since the advent of private sector participation. Rail transportation offers considerable cost savings over actual road freight costs to Upper and Middle Egypt, but this advantage is considerably reduced by the road freight equalization system. The railway offers a service to fertilizer distributors of approximately 1,000-ton trains, with 3 station deliveries. Such quantity restrictions (necessary for efficient rail operations) do not offer the flexibility of delivery that road transport provides to either distributors or wholesalers. The small margins available to both of these parties also decrease the attractiveness of rail deliveries because inventory holding costs are increased. Introduction of more suitable off-season discounts, as recommended, will encourage increased use of rail transport, with the benefit of reducing the amount of heavy road traffic to Middle and Upper Egypt.

7.10 REGULATORY CONTROL OF INPUT MARKETING

7.10.1 Dealer Licensing

Commercial distributors and dealers in fertilizer, agricultural chemicals, and seed are legally required to have a license to conduct business. The original policy was established in Law 53 in 1966. Ministerial Decrees 590, issued in 1984, and 215, issued in 1985, for fertilizers and pesticides, respectively, defined the policies. A more recent decree, issued in 1989, requires that a member of the Agricultural Engineers Union must be the executing manager of an agri-inputs business. When a dealer wishes to handle fertilizers, pesticides, and seeds, three separate applications must be submitted to three different committees of the MALR, namely:

Fertilizer Committee	-	Soil, Water Research Institute
Pesticide Committee	-	Central Laboratory for Pesticides
Seed Committee	-	Central Administration for Seed

These three committees reside within the MALR in Cairo.

7.10.1.1 Fertilizer Licensing

A fertilizer license has three components: a business registration and taxation number, a technical personnel requirement, and a storage inspection and approval requirement. Applications are submitted at the governorate level with a LE 20.00 application fee. Local inspections and checks are then made–a process that typically takes about 1 month. The Ministry of Housing and Construction regulations for fertilizer storage buildings have to be met. These regulations include, in part, requirements that the storage building be 50 meters from the nearest residential housing and have solid walls and roof, power and water supply, and equipment for fire control. The storage area(s) license is specific to a business.

These regulations are a serious barrier to entry into the fertilizer business. Frequent reports were received, during field visits, of even licensed dealers being prosecuted for storing fertilizer in unauthorized areas. Sometimes, these areas were the PBDAC storage areas, which had been used for storing fertilizer for many years but were not registered for use by the specific business. The regulations only cover warehouses and not open storage areas, which are quite suitable for fertilizer storage in the Egyptian climate. Some instances were seen of licensed fertilizer warehouses operated by the private sector, which probably did not meet the legal requirements.

Fertilizer storage safety requirements were easily administered when the PBDAC had full control and ownership of all fertilizer products. Under the policy changes already enacted, ownership of fertilizer changes several times in the distribution system. In addition, the increased supply of ammonium nitrate is a significant change. With the exception of ammonium nitrate, which is an oxidizing agent, and anhydrous ammonia (which is limited to the production sites), none of the fertilizer materials transported and stored in Egypt present any potential hazards to the community. Ammonium nitrate transporters and storers must be aware of the safety precautions for the transport and storage of this product. This is a topic not specifically dealt with in the current regulations. Contamination of ammonium nitrate with organic matter or fuel oils represents significant potential dangers in addition to general fire hazards. While this may not be a problem with product secured in bags, spillages represent a potential source of contamination. This situation should be addressed by the regulatory authorities.

A common complaint is that the elapsed time for a license application to be approved has been up to 6 months, although some improvements have taken place recently. The licensing approval process could be expedited by combining the three licensing committees of the MALR or by providing full approval procedures at the governorate level and only registration at the national level. Finally, the licensing requirement for an agricultural engineer to be employed is a significant barrier to legal entry for small retailers. Indeed, the whole combination of business registration, storage requirements, and qualified personnel is very difficult for small retailers to achieve and is unnecessary. As a result, there are an estimated 5 to 10 unlicensed dealers for every licensed dealer. This is perpetuating a degree of illegality in fertilizer trading that is not desirable.

The PBDAC, in February 1993, requested the MALR to consider three changes to the fertilizer licensing requirements. These are: (1) that the need for an agricultural engineer be rescinded, (2) that any licensed dealer's storage facilities are automatically extended to include any PBDAC storage area, and (3) that the licensing process should be streamlined, possibly by providing approval at the governorate level only. It is believed that, in principle, these requests have been approved and that a committee has been appointed to examine the situation and make specific recommendations.

It is recommended here that changes to dealer licensing should be more comprehensive than the initial PBDAC requests. It is recommended that:

1. The requirements for obtaining a license to deal in fertilizer should be limited to business registration and conditions for storage registration. In addition, there should be a separation of business registration and storage registration.

2. Fertilizer licensing should be limited to distributors, wholesalers, and those businesses engaging in both wholesaling and retailing.

3. Fertilizer retailers selling only to farmers, and handling less than 400 tons of fertilizer per year, should not be required to obtain a dealer's license but should have a business registration for tax purposes.

4. The licensing of storage areas for fertilizer should be separate from the fertilizer business license and limited to storages with a capacity of more than 10 tons.

5. The minimum storage building/storage space specifications and other conditions for fertilizer should be reviewed and revised by the Ministry of Housing and Construction to separate conditions for enclosed warehouses and open storage areas.

6. Qualifying warehouses and open storage areas should then be registered and be available for use by any licensed or unlicensed fertilizer business for the storage of fertilizer.

7. The current requirement for the executing manager of a licensed fertilizer business to be a member of the Agricultural Engineers Union is unnecessary and should be deleted from the fertilizer licensing conditions.

8. Fertilizer business licenses and fertilizer storage licenses should be approved at the governorate level and only registered at the national level.

9. The three MALR licensing committees should be combined.

10. The ammonium nitrate production companies should collaborate in producing and distributing standardized safety precautions for the transport and storage of ammonium nitrate.

11. Registered fertilizer storage areas should be required to display the safety regulations for the storage of ammonium nitrate.

7.10.2 **Product Registration**

The MALR has the responsibility for registration of all agri-input products. Again, there are three committees that deal with these registrations. In theory, the private sector can register any product. Registration for use and recommendations by the MALR for use by farmers are closely linked.

Fertilizers have to be registered and, also, new products have to be field tested. It appears that in 1988, when the government allowed the registration of soluble fertilizers for drip irrigation systems and foliar applications, that such field evaluations were ignored. Several hundred compounds were registered and a great deal of confusion among farmers prevailed. Farmers were faced with so many new products and no knowledge on their proper use that the development of demand for these types of products was severely curtailed.

The EFDC is actively developing and testing new soluble fertilizer products. These need to be registered and the field testing programs approved for registration purposes. It is also recommended that the MALR initiate new field trials to evaluate the use of potassium chloride to support the introduction of this product (see Sections 11 and 13 for supporting argument). The development of comprehensive fertilizer legislation covering registration and quality assurance is also recommended to protect users (farmers) from any malpractice within the private sector.

7.10.3 **Quality Assurance**

Prior to the policy reforms, the quality assurance of agricultural products was the responsibility of the manufacturers, and since the majority of the distribution and credit-in-kind sales to farmers was in the public domain, there was little need for any additional regulations concerning quality or weights of products. Under this system, farmers did not always obtain products of the highest quality nor were they assured of standard weights. With a privatized distribution system, there is now a need for tighter quality control and weight guarantees. The manufacturers can no longer be completely responsible for quality assurance because ownership of products now passes through many hands in the distribution network. The responsibility, therefore, passes to the government. Only two reported instances of private sector malpractices involving fertilizers (adulteration and underweight bags) came to the attention of this study. It should be noted that in open, competitive market systems obvious malpractice by the private sector is self defeating because farmers are free to take their business elsewhere.

Although a system of quality control will not ensure that quality products of a specific weight will always be delivered to farmers, a quality control system can assure farmers of a line of recourse or action for the prosecution of malpractices.

It is recommended, therefore, that the MALR prepare comprehensive fertilizer registration and quality control legislation covering guaranteed analysis, weights and measures, bag labeling requirements, and authority to enter premises to take samples and check bag weights. The legislation should also define malpractices (such as adulteration and underweight bags) and the authority to prosecute offenders. Additionally, the legislation should cover the level and extent of fines, license revocation, and compensation to customers for malpractices. This legislation should be applicable to all parties in the fertilizer sector from the production companies through to retailers. To enforce such legislation, the MALR needs to maintain quality control laboratories capable of analyzing fertilizers and other agricultural inputs in a timely manner and train field inspectors in sampling techniques.

8. PESTICIDE MARKETING

8.1 INTRODUCTION

Pesticides include insecticides, herbicides, fungicides, and other groups of use-specific chemicals. Insecticides are the most important of the pesticides used in Egypt, and insecticides for use on cotton account for 70% of total pesticide use. The MALR classifies pesticide use into two major categories: traditional and nontraditional crop use. A better interpretation of this classification might be strategic and nonstrategic crop use. Prior to the reforms, private sector companies were allowed to import and sell pesticides for the nontraditional crops at unsubsidized prices. The main use for these pesticides was in fruit and vegetable crops and certain other crops, including field beans. Chemicals used for nontraditional crops were sold through some 10 or 12 distributors, each one having a dealer network and technical support from the international chemical companies.

For the traditional or strategic crops (cotton, rice, sugarcane, maize), the MALR issued tenders for certain pesticides, which the PBDAC and the MALR would procure from domestic formulators or from imports. The PBDAC financed these purchases and stored the chemicals for the MALR, making them available when and where needed. The PBDAC received a commission for this service.

When required, the pesticides were applied by the MALR to the traditional crop blocks and farmers were charged set fees for this application service. Both the chemicals and the application services were subsidized. Chemical companies bid on government tenders and maintained technical staff in Egypt to assist in the proper application and use of the pesticides, although no sales or marketing staff were employed.

8.2 DEVELOPMENT OF PRIVATE SECTOR PESTICIDE MARKETING

As the policy reforms incrementally eliminated the traditional crops from controls and the applicable subsidies during the late 1980s, the private sector pesticide distributors and dealers took over the government's role in the supply and application of pesticides, and farmers increasingly began to apply pesticides to their own crops. Egypt has five pesticide formulators – four in the private sector and one in the public sector (Kafr El Zaiyat Fertilizers and Chemicals Company). This allows for the competitive options of either importing the finished products or the active pesticide ingredients for domestic formulation. Several complaints regarding poor quality of domestic private sector formulations were received during field visits, but no verification of these complaints was made; however, this is an area for increased government regulation on quality assurance (see Section 7.10).

8.3 PRODUCT INTRODUCTION AND REGISTRATION

The MALR is responsible for the registration of new agricultural chemicals, and the new products are registered with the Department of Plant Pest Control. Manufacturers supply the registration department with all of the chemical, toxicological, and efficacy data for the product, together with all the analytical procedures that can be put into practice in Egypt for analyzing the product. The registration data and values from developed countries are readily accepted. Egypt is primarily interested in the evaluation of pesticides from the standpoint of toxic effects to humans and the environment. The registration processes take about 3 years to complete, a realistic time period by international standards. Once products are registered, it is relatively easy to obtain permission to import materials from the Petition Committee for Registered Pesticide Imports in the MALR. There are over 300 pesticides registered with the MALR. The registration of products does not appear to be a constraint to private sector development of the pesticide business.

8.4 PRODUCT APPLICATION

Farmers have been applying chemicals to nontraditional crops for many years. As the traditional crops were released from the government controls, the farmers have taken over, using chemicals supplied by private sector chemical dealers.

By far the greatest use of pesticides, particularly insecticides, has been on cotton. Because the production and marketing of cotton have now been deregulated, there is concern in MALR, and among some of the pesticide companies, about who will inspect the cotton crops and apply the necessary chemicals. It is currently planned that, for the 1993 crop season, the government will apply chemicals to blocks of at least 20 feddans. Any lesser areas will need to be treated by the farmers themselves. Private applicators need to be encouraged, as rapidly as possible, to bridge this gap. Integrated pest management needs to be developed quickly, with more work on proper scouting and application techniques being done by the extension service, dealers, and private consultants.

In 1992, the government (as part of its subsidy reduction program for cotton production) scaled back subsidized pesticide applications to just a cotton boll weevil spraying program. The program included three components: (a) the subsidized program for the control of boll weevil, (b) additional, optional spraying by the government at the request of, and to the cost of, the farmer, and (c) the farmers' own pest control program. In addition, the government program has two sub-components–the manual picking of the boll weevil worm eggs and a chemical program. It is our understanding that private applicators were contracted in 1992. Field surveys of farmers conducted after the 1991 and 1992 seasons by the MALR produced several conclusions: (a) in 1992, three sprayings for pest control were made by the government program (if needed) and 71% of the farms requested additional spraying by the government, covering 64% of the cotton; (b) in addition to the GOE subsidized program and the GOE optional pest control programs, over half of the cotton area had farmer control programs; (c) farmer expenditure for pest control in 1992 averaged feddan LE 51.58/feddan for optional GOE spraying, LE 1.35 for the manual control program, and LE 24.00 for farmers' chemical program, a total expenditure of LE 77.23/feddan; in addition, (d) farmers are charged LE 20/feddan for the regular GOE program, for an average total cost for all cotton of LE 97.23/feddan.

Cost of the voluntary programs varies widely, probably as a result of different levels of infestation. In further opinions, nearly half of the farmers indicated they could handle their own chemical application programs. The other half indicated a lack of chemical application equipment or knowledge.

It is recommended that the government should remove itself from the application of the chemicals as rapidly as possible to allow private applicators and private chemical dealers to develop their businesses. The GOE will probably need to continue to provide scouting services for critical pests such as the boll weevil to avoid problems of control in this transition stage. There are no indications at this time that farmers are unable to handle their own control programs. The chemical companies, extension service, and the dealers should receive extensive training to ensure that the farmers have the information needed for good pest control. The government also needs to remove itself from the purchase of pesticides as rapidly as possible. Maintaining stocks of pesticides only delays the direct involvement of the private sector in building their own stock levels to handle the market needs. The dealers and distributors visited in this study indicated that if given sufficient lead time, the private sector can handle the cotton pest control programs.

With sugarcane, one of the last crops to be deregulated, the Sugarcane Growers Cooperative could easily take over the responsibility for the application of pesticides. This cooperative is already requesting fertilizer from the fertilizer companies for their members in 1993/94.

8.5 PESTICIDE SAFETY

A major national concern is the safe handling of pesticides. As the government has reduced its control over the scouting for pests and the purchase and application of chemicals, there have been more pesticides handled and applied by farmers. This decontrol has occurred rather rapidly. There needs to be a joint effort, launched by both the extension service and the agricultural chemical companies, to continue to teach farmers, and now dealers, about the hazards of chemicals and how they should be handled. The new Dealer Development Program, which the PBDAC is planning for some 1,500 agri-input dealers, includes a safe pesticide handling training module. The chemical companies are in the process of trying to form an Egyptian branch of the Group of National Associations of Manufacturers of Agrochemical Producers (GIFAP). In discussion with some of the planners for this organization, it was indicated that pesticide safety training for the farmers and dealers could be one of the organization's responsibilities. The incorporation of safety and technical training into the licensing requirements of pesticide applicators is also recommended and the MALR should take further steps to support pesticide safety training for the private sector.

8.6 PESTICIDE DEALER AND APPLICATOR LICENSING

As a result of the policy changes impacting the marketing and use of pesticides, the following recommendations are made for the licensing requirements of pesticide dealers and distributors, and separating the requirements for dealers from those of applicators.

1. A pesticide license should be required for all businesses selling pesticides.

2. A pesticide sales license should not require the executing manager to be a member of the Agricultural Engineers Union, but should require that the executing manager be able to read and understand the specifications, recommendations, and safety instructions on pesticide labels.

3. As with the fertilizer license recommendations, there should also be a separation of the sales license from the registration of storage areas for pesticides. The current conditions for the safe storage of pesticides should be strictly enforced and consideration given to ensuring that any storage area for pesticides be capable of being secured and locked.

4. A separate pesticide operator's license should be required for the registration of pesticide applicators. Membership of the Agricultural Engineers Union should be a requirement of this license.

5. Consideration should be given to the development of technical and safety training programs for pesticide applicators by the MALR. Completion of this training should be incorporated into the licensing requirements for applicators.

9. IMPACT OF REFORMS ON PBDAC INPUTS DISTRIBUTION

9.1 INTRODUCTION

The disengagement of the PBDAC from farm inputs distribution, including fertilizer, has had major impacts on the bank. These have been felt most seriously in the areas of redundant personnel, loss of income, underutilization of storage facilities, changes in farm credit administration and control, and in the loss of information concerning farm input use by farmers (an essential tool for credit management to the farm sector). However, the opportunities afforded the PBDAC to concentrate all of its resources on strengthening its position as a strong rural bank, serving the development interests of the country and its farmers, outweigh the current transitory problems. These major issues are discussed not with the purpose of highlighting the problems but with the intent of providing some guidelines, which the PBDAC may use to transform itself into a more profitable and vigorous organization. The management of the PBDAC has already embarked on many programs to address the major concerns created by the policy reforms. Recommendations are provided to assist in these programs.

9.2 PERSONNEL

Approximately 16,000 people were engaged in the PBDAC input distribution activities prior to 1991. This number includes the staff in the BDACs, who, for the most part, are still employed, although some have been redirected in their activities. The PBDAC has initiated a voluntary early retirement program, retraining programs, and a freeze on further employment. These programs should progressively reduce the number of redundant employees and are to be commended. The concerns of the PBDAC management over wholesale dismissals are understandable in the light of the alternative employment opportunities available. However, from our discussions with a limited number of the PBDAC staff, it appears that many of the staff are simply waiting for the management to extend the voluntary retirement packages to a wider sphere of personnel. In the meanwhile, there is obviously a serious low morale situation among those employees who have little or no work to engage in. An early resolution to the problems is required.

One of the schemes being considered is the voluntary operation of the mandoubiahs by mandoubs, either on a profit-sharing basis as employees of the bank or as independent, private-sector retailers leasing the mandoubiahs. These proposals should be implemented in a voluntary, selective, and systematic manner, paying due regard to the capabilities of the mandoub volunteers, the business prospects in the selected locations, and under conditions of business training (and technical) support for a defined period. No special terms or conditions should be imposed that would leave the selected mandoubs at either an advantage or disadvantage compared to the private sector.

These proposals have created various responses as to how many of the mandoubs would be interested and capable of succeeding in such ventures. Various estimates range from 400 up to 1,000 of the 3,800 mandoubs. These estimates appear unrealistically high. Many of the PBDAC mandoubiahs are not situated in the center of business activity in the villages and rural towns; a distinct disadvantage compared to the already established private sector dealers. Farmers have now had almost 2 years to adapt to the presence of the private sector. Further delays by the PBDAC in launching the proposals will erode the chances of the mandoubs, no matter how well known to farmers, from re-establishing a clientele. Finally, the mandoubs are used to working in the public sector and many will not be capable of surviving in a competitive environment. A target figure of 100 mandoubs would appear more realistic and given the element of time a practical level for the PBDAC to aim for.

9.3 PHYSICAL ASSET UTILIZATION

9.3.1 **PBDAC's Decreasing Storage Requirements**

Because the PBDAC is disengaging from the supply and distribution of fertilizer and other agricultural inputs, the need for storage space has rapidly declined. In the past, the extensive storage facilities were used for all of the commodities the PBDAC handled on behalf of the agricultural sector, both inputs and outputs. The supplies destined for farm use included fertilizer, pesticides, machinery, seeds, and livestock feed. To the extent that the PBDAC engaged in the marketing of crops (primarily white corn, wheat, and sesame), these were temporarily stored in PBDAC warehouses. In addition, the stores were used to stock commodities imported by the PBDAC, such as yellow corn and sorghum.

The upcoming tranche (Tranche VI) of the Agricultural Policy Reform Program of the USAID-financed Agricultural Production and Credit Project (APC Project) includes a requirement for the development of a program to "sell, rent or dispose of PBDAC storage warehouses, except those justified for banking purposes" (Tranche V Report, p. 123).

9.3.2 The Extent and Capacity of PBDAC Storage Facilities

The PBDAC and the governorate-level BDACs both own and rent storage facilities, the far greater share being owned or controlled by the BDACs. Of the total amount of space owned by the banks, only 14% is owned directly by the PBDAC. Similarly, 98% of the rented storage space is controlled by the BDACs (see Table 9.3.1).

The types of facilities include enclosed warehouses and stores and open-sided sheds and shounas. The governorate of Sharqiya has the largest amount of storage space (11 warehouses, 23 stores, 24 sheds, and 56 shounas), both owned and rented, with a total area of over 470,000 m^2. Each of the BDACs of Beheira, Daqahliya, Beni Suef and Menoufiya control over 350,000 m^2 (see Table 9.3.2 and Figure 9.3.2).

A PBDAC report, compiled in January 1993 based on survey data from 15 BDACs, indicates that only 19% of the total amount of storage space was in use, and 77.5% remained available to be rented out (Table 9.3.3). Even after a series of efforts to rent out the available space, however, only about 3.5% is now rented to the private sector. The January 1993 report lacks data for several BDACs and for storage facilities under the direct control of the PBDAC and therefore the total storage reported in Table 9.3.3 is not comparable to that reported in Table 9.3.2 for 1992.

One problem with the lack of success in renting out storage facilities may be the rental rates recommended by the PBDAC to the governorate-level banks. In 1992, these rates were reported to be:

Open storage (under tarpaulin)	LE 1.0-1.5/m²
Sheds (open sides)	LE 1.5-2.0/m²
Closed warehouses	LE 2.5-3.0/m²

If a sample survey of potential renters indicates that price is a primary consideration, the rates should be lowered to a level that attracts as many occupants as possible. Changes to the fertilizer licensing requirements that have been recommended (separating storage registration from dealer licensing) will also lead to increased utilization of storages. A significant problem reported by dealers is that the PBDAC staff at warehouses close the facilities at 2:00 p.m. or 3:00 p.m. thus curtailing their use by dealers. The PBDAC must provide free access to storage facilities at all times if the leasing program is to be successful.

9.4 BANKING ACTIVITIES

From 1976 until July 1991, the PBDAC had full responsibility for the implementation of government policy for both credit and the distribution and supply of agricultural inputs. The long-term program of economic policy reform, introduced by the government in 1986, included a program for the progressive disengagement of the public sector from the distribution of agricultural inputs. This policy led to significant changes in the role of PBDAC and eventually led to the ending of its monopoly position in the distribution and marketing of fertilizer.

The PBDAC is now in the midst of a transition in which it is facing the challenges of becoming a fully autonomous bank responsible (1) for its own financing, loans, profits and losses and (2) for expanding its lending to farmers, cooperatives and the rapidly expanding private sector.

The progress of PBDAC toward financial autonomy is covered in a January 1992 amendment to the 1990 GOE-USAID Memorandum of Understanding (MOU) on the Agricultural Policy Reform Program of the Agricultural Production and Credit (APC) Project. This amendment, included in the MOU as "Benchmark #9," requires the PBDAC to improve its overall financial condition and achieve a higher level of self-reliance through:

1. Increasing deposits.
2. Maintaining the ratio of interbank borrowing to the volume of lending.[7]
3. Increasing PBDAC equity (capital plus reserves).

PBDAC operates through a network of governorate, district, and local banks. The network consists of:

17 Governorate Banks (BDACS)[8]
155 District (Markazes) Branches
801 Village Banks

The village banks have authority to approve loans up to LE 20,000 for any type of agricultural credit. For amounts above that level, the approval of the district branch must be obtained. The district-level bank can approve loans up to LE 100,000, and the Governorate BDAC has the power to authorize loans up to LE 500,000. Loans above 500,000 must be approved by the the PBDAC Board of Governors and authorized by the PBDAC Chairman. Each month, the chairmen of the BDACs meet with the senior officials of the PBDAC to evaluate lending activities, review major loan requests from the BDACs, and discuss credit issues, including projections of credit requirements for the next crop season.

As of the end of FY 1990/91, in-kind loans were terminated. All PBDAC loans are now in cash. In addition to the short-term loans for production and the medium- and long-term loans for equipment, the PBDAC has initiated a new category of loans for private dealers in agricultural inputs. Loans in this new area are considered commercial loans. Commercial loans, which require the goods being purchased serve as collateral, are made at 65% of the wholesale value of the goods. The PBDAC interest rate on commercial loans, set at 23% in 1992, was reduced to 21% in January 1993 and a further reduction is planned for April 1993.

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7. The exception being, "unless interbank borrowing is the most efficient financing resource."

8. In Alexandria, Cairo, Port-Said, and Suez, instead of operating through governorate-level BDACs, the PBDAC directly administers its banking operations.

9.4.1 Growth of Agricultural Loans (1981-1991)

The total value of in-kind and cash loans for all agricultural inputs (seeds, fertilizer, pesticides) for FY 1981/82 amounted to LE 271,601,380. In-kind fertilizer loans for that year came to LE 107,408,800 or just under 40% of the total value. By FY 1986/87, the total value of input loans had increased by 52% to LE 517,843,510, and fertilizer loans continued to account for 40% of the total (see Tables 4.7.2 and 4.7.3). By the end of FY 1990/91, input credit had reached a total of more than LE 1.5 billion and fertilizer loans had increased to LE 540 million, but declined slightly as a percentage of total loans to just over 35%. Overall, the value of agricultural loans increased by nearly 567% during the 10-year period, with fertilizer loans increasing by 502%. Total PBDAC lending for FY 1990/91 came to LE 4,364,300,000.

Given the growth patterns for credit utilization, it can be expected that, despite the increased costs of inputs due to the discontinuation of subsidies and higher interest rates, demands for agricultural credit will continue to grow. Two additional factors should contribute to an increased demand for credit: the fact that farmers have indicated plans to plant more cotton during the upcoming season and the fact that the PBDAC will begin to make more loans to the private sector. This projected growth has raised concerns that any shortages of credit would result in decreased fertilizer usage which would, in turn, result in decreases in production. Credit availability, however, does not seem to be a problem as the total lending by Egyptian banks has not reached the shut-off levels required by the International Monetary Fund (IMF).

In May 1991, based on an agreement with the IMF, the Central Bank established a total credit ceiling for the country and credit ceilings for each bank. These ceilings were to be reviewed on a monthly basis. Although the governorate-level BDACs projected strong increases in credit demand, increases in loan interest rates and higher rates on treasury bills served to constrain credit requests and the ceilings were not reached. In January 1992, when credit totals continued to be below the agreed ceiling levels, the ceilings for individual banks were no longer required and the monthly reviews were discontinued.

The fact that overall bank lending in Egypt has not reached the established credit ceiling would appear to mean that there should be no shortage of credit for the agricultural sector. While credit shortages may not be a problem, however, the higher costs of credit, overly cautious PBDAC loan officers, and slowness in loan approval may impact on the PBDAC's total lending picture. While the PBDAC has had a strong record in the provision of agricultural credit, the loans had been almost automatic. There was little need to appraise the credit worthiness of the clients. This will be a new element of the lending program that could result in delays in responding to loan requests.

The PBDAC's concerns about maintaining a commendably high level of loan repayment may tend to make loan officers more hesitant to accept reasonable levels of risk and be slower in approving loan applications. Prior to the elimination of required crop allocations, the calculation of credit was based on a well-established routine. Production quotas were allocated by the ministry and linked to the supply of inputs. Because the PBDAC controlled both the supply of agricultural credit and the supply of inputs, credit recovery was automatic. In the past, farmers who wished to be able to receive subsidized credit for the next crop season had to repay their loans. Some officers of the PBDAC have expressed concern that, because the bank no longer has this leverage, the rate of loan repayment will fall. There is a risk that, if the repayment rate declines, PBDAC loan officers may become too cautious with the result that the total amount of loans will be reduced.

9.4.2 Sources of PBDAC Financing

Increasing deposits was one of the items required in the Memorandum of Understanding as a means for the PBDAC to improve its overall financial condition and attain a higher level of self-reliance. Since July 1991, the bank made a concerted effort to increase deposits, at times even making use of television commercials. A key factor in the increase in deposits, however, has been an increase in the interest rates on deposit accounts. In November 1992, the PBDAC Board of Governors approved significantly higher interest rates on deposits (a move taken by all of the country's banks) to promote increased savings. New rates became effective on March 15, 1993 (see Table 9.4.1).

To make deposits attractive, the interest on savings and deposit accounts in the PBDAC is exempted from all taxes and duties. In addition, the accounts may not be seized or attached for any reason and the debts of depositors are not deductible from their savings. The push for deposits has shown some results. The increase in total deposits from FY 1991 to FY 1992, an increase of approximately 16%, is shown in Table 9.4.2. The gains were made despite a drop in the current accounts and came mostly in fixed time deposits.

There are, however, two important constraints to increasing savings deposits from farmers. One is that, to many farmers, the PBDAC does not have the image of a bank. Because it has been the source of both credit and inputs and has been involved in crop marketing, farmers tend to consider the PBDAC a government agency rather than a bank. On the local level, the village banks do not look like banks. In addition, the village units are operated by people who know and are known by the farmers. For reasons of confidentiality, some farmers do not want to open a savings account in the village banks. A second constraint is that a large portion of the farming population has no excess income to save. A 1984 survey indicated that 47% of the farmers interviewed reported that they had no surplus income to deposit. An additional 37% said they preferred to use any surplus to invest in their farm. Although there has been improvement in rural incomes since that time, it continues to be true that many farmers have no surplus remaining after covering basic family expenses.

Table 9.4.3 updates the data on PBDAC deposits, outstanding loans, interbank borrowings, and equity provided in the APC monitoring and verification report of June 1992. The table indicates that equity increased LE 117 million from FY 1990-91 to the end of FY 1991-92.[9] As of the close of FY 1991-92, the total amount of deposits in PBDAC, including current accounts, was LE 1,865,800,000, with current accounts making up almost 28% of this total. The cost to the PBDAC of borrowing from commercial banks was 13.8% to December 1991 and was increased to 16.3% as of January 1992. The average cost of concessionary foreign loans to the PBDAC is 10.4%.

9.4.3 **PBDAC Lending Policies to Distributors and Dealers**

To partially offset the loss of income from inputs distribution the PBDAC has a policy of promoting commercial loans to the private fertilizer distribution sector. This includes loans to both distributors and dealers. Distributor credit facilities are limited to 20 million LE. This policy is aimed at preventing a limited number of distributors

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9. Equity includes capital, reserves, and capital grants.

from gaining excessive market shares due to their financial strength. This is a commendable aim. The bank also provides bank guarantee services to distributors for dealing with the factories. However, several constraints in the operation of financial services to distributors are apparent. Where the value of the fertilizer is provided as collateral the bank only lends up to 65% of the value compared to 80% to 85% supplied by commercial banks and the fertilizer has to be stored in PBDAC warehouses. Apart from restrictions on access to stocks in BDAC warehouses the daily storage records are taking up to 10 days to reach BDACs and this restricts distributors from withdrawing stocks used as collateral until the BDAC clearance is received. This cumbersome system slows product turnover, increases storage costs and reduces the attractiveness of the bank's financial services to distributors. When letters of guarantee are issued distributors have to deposit 100% of the value of the guarantee due to a ruling by the Central Bank designed to prevent the PBDAC from competing with the commercial banks which have to operate under the financial regulations of the Central Bank. As the commercial banks have shown little interest in providing letters of guarantee to fertilizer distributors the PBDAC should attempt to get this restriction removed. This would allow more potential distributors to obtain letters of guarantee to facilitate dealings with factories. Distributors have also complained about financial services costs charged by the BDACs.

Transferring funds from one BDAC to another or to the PBDAC incurs a fee of 0.35% of the transfer value. By comparison, commercial banks charge a flat fee of only LE 3.50 per transaction. Crediting deposits made in BDACs for transfer to accounts in PBDAC or other BDACs was reported to be very slow and incurred distributors with additional interest costs.

The PBDAC lending policies for dealers also create several constraints and additional costs to dealer operations. In the first place PBDAC only makes loans to licensed dealers. This policy restricts the financial services to one fifth of the total dealers and is a pressing reason for amending the licensing regulations as recommended. Some BDACs have been insisting on collateral in the form of buildings only. This may restrict the entry into fertilizer marketing to dealers with substantial financial resources. In general it is recommended that the PBDAC should review its financial services to fertilizer dealers with a view to improving the level of service, improving bank employee's knowledge of dealers' problems and operating constraints, and, while not eroding sound credit principles, improve access to credit for smaller dealers.

10. IMPACT OF THE REFORMS ON THE COOPERATIVE SECTOR

10.1 INTRODUCTION

The objective of this section of the study is an examination and assessment of the structures and capabilities of Egyptian cooperatives and their ability to fill a significant role in the supply and marketing of fertilizer and agri-chemicals. Based on field visits, interviews, and a review of relevant data, this section examines the impact of the reforms on the cooperatives and provides recommendations on the potential role of cooperatives in addressing the constraints and gaps in the delivery of services to the agricultural sector.

Beginning in 1986 and continuing to the present time, a series of government-initiated institutional and policy reforms, directed at opening the distribution and marketing of agricultural inputs to the private sector, has resulted in significantly changed roles for the PBDAC and for the majority of the country's cooperatives. The policy reforms, aimed primarily at reducing government costs related to agriculture, included a plan for the progressive disengagement of the public sector from the distribution of agricultural inputs. This eventually led to the ending of the PBDAC's monopoly position in inputs distribution and supply and opened the way for the private sector and the cooperatives.[10] As a result, the cooperatives find themselves, for the first time, in a situation of direct competition with private traders in the marketing of fertilizer.

Once given the opportunity, the private sector quickly moved into all levels of the fertilizer trade, from large volume wholesale and distribution down to the retail level. For the most part, the cooperatives moved much more slowly and, consequently, have largely been left behind. The speed and relative ease with which private sector traders became the principal actors in fertilizer distribution came as a surprise to both the cooperatives and the PBDAC. In contrast, lacking a planned, unified response to the changes in government policy, the cooperatives have lost, perhaps permanently, the opportunity to fill a significant role in fertilizer distribution and marketing. In missing this opportunity, they have also lost a potentially important source of income.

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10. The Egyptian constitution recognizes cooperatives as a third sector of the economy, distinct from both the public and private sectors.

Any analysis of the capacities and potential of the cooperatives should include an examination of financial data. For the most part, however, this kind of information was not available for the preparation of this report. Although requested during the field research, it was not possible to obtain precise information on the financial status of the cooperatives visited. The only financial information provided tended to be limited to general, undocumented statements about business volume, working capital, reserves, and member share capital. Inquiries about the particulars of a cooperative's financial status were usually answered by optimistic affirmations that the cooperative was financially strong and would be able to compete successfully with the private sector. While the lack of full fiscal data makes it more difficult to evaluate the potential of the cooperatives to regain a significant role in fertilizer marketing, the field visits and other research have yielded sufficient information to allow a number of conclusions to be made about the strength and capabilities of the cooperatives vis-à-vis that of the private dealers.

10.2 OVERVIEW OF THE COOPERATIVE SECTOR

10.2.1 **Background**

During the four decades since the important political changes of the early 1950s, Egypt's government-initiated cooperatives have been subjected to a number of reorganizations and revisions of their areas of responsibility. It is fair to state that, throughout this period, the cooperatives have been considered by government policymakers as a means of organizing and mobilizing the country's agricultural producers and as channels for providing farmers with supplies and services. From the government's perspective, this continues to be their primary role.

10.2.2 **Organizational Structure**

Although the current system of cooperatives is based on the Cooperative Law of 1980,[11] to a large extent, the basic cooperative structures date from the political reorganization of 1952, the subsequent programs of land reform, and further modifications during the 1960s. During this period, the cooperatives were given

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11. Agricultural Cooperative Law 122/1980, amended by Law 122/1981.

major responsibility for handling agricultural credit, input distribution, and the marketing of crops.

There are four basic types of agricultural cooperatives, each of which has a national level ("general") organization:

- Multi-Purpose Cooperatives
- Agrarian Reform Cooperatives
- Reclaimed Land Cooperatives
- Specialized Cooperatives

For each type, the organizational structures tend to be hierarchical, multilayered, and complex. In addition to the national level Central Agricultural Cooperative Union (CACU), which (at least in theory) serves as the apex organization for all agricultural cooperatives, there are four levels of multipurpose cooperatives (local, district, governorate, national), three levels of agrarian reform cooperatives (local, district, national), and two levels of reclaimed land cooperatives (local and national). Most of the specialized cooperatives, which focus on the production and marketing of particular crops,[12] have structures at both the local and national levels, although some also have governorate-level organizations (See Figure 10.1).

The Agrarian Reform cooperatives were created following the land reforms of 1952. Largely established during the Five-Year Plan of 1956-61, these cooperatives consisted of farmers who had been resettled on the re-allocated lands derived from the nationalized estates of large landholders. There is a total of 700 local agrarian reform cooperatives involving some 350,000 households farming 750,000 feddans. Agrarian reform cooperatives exist in 18 governorates, they have 70 district-level organizations and a national coordinating body.

Progressively established throughout the period following the completion of the Aswan High Dam in the mid-1960s, the land reclamation cooperatives were set up to provide supply and marketing services to families that were allocated land in the

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12. Specialized cooperatives have been established to provide input and marketing services for specific crops. There are, for example, specialized cooperatives for livestock, rice, flax, potatoes, and sugarcane. The specialized cooperatives have voluntary membership and demonstrate a much higher degree of member participation than the other types of cooperatives.

reclaimed flood plains. Over the years, the government has organized a total of 440 of these cooperatives involving approximately 58,000 families farming the reclaimed areas. Large portions of these reclaimed lands have been planted to fruit crops. Once the crop areas are planted and under production, land titles are provided to the farmers through the cooperatives. A number of agricultural graduates are involved in the land reclamation cooperatives, providing many of these cooperatives with relatively high levels of agricultural and business skills.

Although all three types of cooperatives at least nominally recognize the CACU as the apex organization for agricultural cooperatives, the CACU exercises a much higher degree of influence over the multi-purpose cooperatives than it does over the others. None of the cooperative structures, however, were created on the initiative of the producer members, but were established by the government to provide inputs and services to the rural areas and to serve as buying points for the convenience of state marketing organizations. All of the activities and structures of the cooperatives were defined by government agencies along lines that assisted them in fulfilling their own mandates.

10.2.3 **Membership**

At the local levels, each village has a cooperative. These local cooperatives vary in size, strength, and the extent of their territories. All agricultural land is included within the territory of a cooperative and all landowners are registered as cooperative members, whether or not they actually farm their property. The 1980 legislation (Law 122/1980) made cooperative membership voluntary, but it continued to require land ownership as a requirement for becoming a member. Because much of the actual farming is conducted by tenant farmers who rent from the landowners and because landowners may or may not be cooperative members, it is difficult to determine the total number of cooperative members with any degree of precision. Although the MALR has tended to consider all farmers as belonging to a cooperative, based on either their geographic location or type of production activity, the local level cooperatives tend to consider as members only those farmers who have paid in their capital shares and regularly conduct business with the cooperative.[13]

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13. Members of land reclamation cooperatives indicate that farmers who buy land from the original landholders are not considered as voting members, but they may purchase supplies and market through the cooperative.

The CACU claims a total national membership of over 4.3 million farmers, but it does not indicate the basis for this assertion. There may be considerable overlap in the membership statistics as, in addition to being a member of a multi-purpose cooperative,[14] any farm producer may also belong to any one of the specialized cooperatives. It is estimated that the multi-purpose cooperatives account for more than 80% of the total membership of agricultural cooperatives. Despite these membership statistics, however, one of the main observations to be made about the cooperatives and their role in the provision of agricultural inputs is that the majority of farmers are not active participants.

Figures for the total number of agricultural cooperatives also vary from one source to another. While the totals are known for the agrarian reform, land reclamation, and specialized cooperative societies,[15] it is more difficult to determine the total number of multi-purpose cooperatives.[16] The CACU reports that there are 5,150 cooperatives in the country (all levels and all types); and a reasonable compromise of various sources places the number of multi-purpose cooperatives at approximately 4,200. While being the most widespread type, with some significant exceptions, the multi-purpose cooperatives also tend to be the weakest.

The 1980-81 cooperative law specifies that each local cooperative to have its own elected board of directors (cooperative council) consisting of from five to eleven members, 80% of whom must be farmers. A 1985 study indicates, however, that these board members have little authority on policy issues or the day-to-day management of the cooperative. The basic policy decisions are made in the ministry and each cooperative has a responsibility for the implementation of these decisions (Rochin and Grossman, 1985, p. 9).

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14. A 1990 survey indicated that 20% of the members of the specialized cooperatives interviewed also served as board members of a multi-purpose cooperative (Loza, Sara, "Social Soundness Analysis for the Development of Private Independent Agricultural Cooperatives," in *Agricultural Cooperative Assessment for Egypt*, p. A4-11, USAID, 1990).

15. Agrarian reform cooperatives, 779 (all levels); land reclamation, 489 (all levels); and 834 specialized cooperatives (all levels).

16. The multifunctional cooperatives were formerly identified as "credit" cooperatives because of their involvement in the provision of credit for agricultural inputs.

All of the cooperatives visited during the period of field research had relatively large numbers of employees in relation to their rather limited scope of economic activities; and the majority of these employees received their salaries directly from MALR rather than from the cooperative. Because of the strong role of government in the definition of the role of the cooperatives and the seconding of managerial and operational personnel from the ministry, the producers almost universally consider them as public sector agencies and part of the state's extension services. As a result of this perception, in most instances, there is no real sense of member ownership or control of the cooperatives and little member involvement in business operations.

10.3 CHANGES IN THE ROLE OF THE COOPERATIVES

Although the cooperatives had been assigned responsibility for agricultural input distribution and crop marketing, important changes in these roles took place in 1976, partially as the result of a dispute between the government and the CACU, and partially because of the government's decision to shift these responsibilities to the Agricultural Credit Bank.[17] The dispute, which centered on the degree of state control over the cooperatives, eventually resulted in the government ordering the disbanding of the CACU for a period of almost 7 years.

After the credit, supply, and marketing responsibilities of the cooperatives were transferred to the PBDAC in 1976, the cooperatives continued to administer the cropping patterns and rotation programs for cotton, wheat, and berseem. This included the consolidation of fragmented landholdings to meet mandated plantings. During this time, crop consolidation was mandated by law as a means of overcoming the problems of applying inputs and harvesting small plots belonging to different owners. Each year, a fixed parcel of land was designated for the cultivation of one particular crop, or sequence of crops. To grow crops that were not designated for cultivation on their land during that year, farmers would exchange use of plots.

The government's assignment of responsibility for input supply, marketing, and credit to the PBDAC included monopoly control over the supply of fertilizer and a takeover of all cooperative storage facilities. Although the new cooperative law of

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17. This was accomplished by Law 117/1976 and the bank was renamed the Principal Bank for Development and Agricultural Credit (PBDAC).

1980 restored some rights of the cooperatives and the CACU was reinstated in 1983, these important responsibilities remained with the bank until the initiation of the current reforms.

10.4 COOPERATIVE RESPONSIVENESS TO THE POLICY REFORMS

10.4.1 The PBDAC Cooperative Pilot Program

The PBDAC monopoly on fertilizer distribution and supply was eliminated in 1989. Initially, the Egyptian Agricultural Organization (EAO) was authorized to distribute fertilizer from the factories to the cooperatives, but, in July 1991, both private dealers and cooperatives were allowed to obtain fertilizer directly from the factories.

In 1988, as part of its divestiture implementation plan, the PBDAC initiated a pilot program to assist cooperatives to re-enter the trade in agricultural inputs. The concept of the program was that the village banks would make cash loans to farmers, who would then purchase PBDAC fertilizer via the local multipurpose cooperatives. The bank, which had set aside an estimated stock for the pilot program, would then pay the cooperatives a 5% commission on the volume of fertilizer they handled. In essence, the program was a transfer of fertilizer sales from the mandoubiahs to the local cooperatives; and the intent was to develop this program in the pilot areas and then implement it in all areas of the country.

In addition to the 5% commission on fertilizer sales, the pilot program was also intended to include other commissions for the cooperatives:

- Commission on seed distribution (LE 1/per unit of seed).
- Commission on loans for pesticides (excluding those for cotton) of 3%.
- Commission on feed distribution (LE 3/ton to LE 6/ton depending on type).

Originally initiated in four districts during 1988-89, the program was expanded to 14 districts in 1990 and to 41 in 1991. It was intended to involve a total of 206 village banks and 1,035 local cooperatives located in the 41 districts. Although the PBDAC assigned responsibility for assisting the cooperatives to its office for private sector promotion, the pilot activity did not include the provision of training or any technical assistance. It involved only the shifting of fertilizer sales from the mandoubiahs to the cooperatives and the payment of the commission.

Once the pilot activity was initiated, however, most of the cooperatives decided that they did not want to purchase their fertilizer from the PBDAC. They asserted that the PBDAC had designated old stocks for the program, that there were too many damaged bags, and that their members were not satisfied with the fertilizer quality. After obtaining their loans from the village banks, the cooperatives bypassed the PBDAC and made their purchases directly from the factories. This refusal of most of the cooperatives to participate in the plan effectively reduced the pilot program to only a few cooperatives. Following the advent of fixed, unsubsidized ex-factory fertilizer prices in July 1991, the pilot program was no longer relevant.

10.5 COOPERATIVES IN A COMPETITIVE ENVIRONMENT

The key issue for the future of agricultural cooperatives is whether they will be able to compete successfully with the private sector. Unless the government is willing to continue its current levels of financial support, the initial evidence indicates that most of them will not. Any effort to improve the business operations of the cooperatives should begin with a diagnosis of the causes of their unsatisfactory performance. If the GOE decides that the cooperatives should become fully self-financing, there are several key reasons why they will have difficulty competing with the private sector:

- High levels of operating costs.
- An uncertain level of member loyalty and participation.
- Lack of both business experience and a business mentality on the part of management and leaders.

Operating Costs – Their status as government-supported entities has enabled the cooperatives to function with little concern for overall financial viability. Although the problem of surplus employees can be addressed, at least in part, by making a clear distinction between those who are essential for the cooperatives' business operations and those who are MALR extension agents, the cooperatives will continue to have a relatively high level of fixed costs that continue throughout the year. As the marketing of fertilizer tends to be seasonal, private traders with few or no full-time employees and low overhead costs will have much greater flexibility in product pricing and should be able to undersell the cooperatives.

Member Attitudes–To a large extent, national and regional cooperative leaders and local cooperative managers have tended to treat the members as clients rather than as equal participants. Farmer surveys indicate that only a small percentage of the total membership of the local cooperatives has any involvement in their operations. A 1985 study of farmer attitudes about the cooperatives indicated that, based on experience, the farmers generally had low expectations of their cooperatives and very low confidence in their management.

> Cooperative members in general clearly judged the economic performance of their cooperatives to be deficient. They believe that the cooperatives are badly managed and administratively inefficient, the performance of the boards of directors is poor,...Members...place very low value on their membership in the cooperative...over 75% of all cooperative members stated that they felt it was not very likely that cooperatives would contribute to member welfare in the future (Rochin and Grossman, 1985, pp. 33,36).

Two more recent survey of farmers, the first conducted shortly before the opening of fertilizer distribution to the private sector, and the second some 18 months later, reflect very different opinions about attitudes toward the purchase of inputs from the cooperatives. In the pre-reform survey, 86% of the farmers indicated a preference for obtaining their fertilizer needs from the cooperatives, and a high percentage registered a high level of distrust of the private sector. In the later survey, only about 41% of the farmers indicated the cooperatives as their first choice for purchasing their inputs, while nearly 60% indicated that they preferred buying from private dealers or the PBDAC. To some extent, this may indicate a growing acceptance of the private sector.

Despite this decline in farmer preference for the cooperatives, however, the two surveys provide some evidence that the cooperatives continue to have a certain amount of loyalty and support.[18]. For those who selected the cooperatives as their first preference, for example, the reasons most of them gave were that the cooperatives were easy to deal with and the inputs they needed were almost always

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18. The initial survey was conducted by Loza (*Op. cit.*); the second was supervised by Mr. R. Krenz (APCP/MALR) Unpublished personal communication, Chemonics, Cairo (March 1993).

available. Another important reason advanced for dealing with the cooperatives was that the prices were stable. Although the later survey indicated that only 40% of the farmers preferred doing business with the cooperatives over the private dealers, as both of the surveys showed a solid level of support for the cooperatives, this may represent a base on which the cooperatives can rebuild a suitable market share.

Business Operations – A third constraint to the ability of the cooperatives to compete effectively with private dealers is the lack of business experience and the lack of a business mentality on the part of management. During the field visits, private fertilizer traders reported that they operated their shops from 8:00 a.m. to 8:00 p.m., while the cooperatives were open for business from 8:00 or 9:00 a.m. to 3:00 or 4:00 p.m. Although many farmers indicated a preference for buying fertilizer from the cooperatives, because they work in their fields during the day, they often find it more convenient to purchase their needs from the private dealers. Some of the smaller private traders operate only seasonally and sell out of their pickup trucks rather than a shop, often going directly to the farmers in their fields. In mid-1992, private merchants indicated that, for fertilizer sales, their primary competition came from PBDAC and other traders. Although the survey indicated distinct regional variations, cooperatives were usually cited as in the second rank of competition (Table 7.6.2). When these same merchants were asked to rank competition for seed sales, private traders ranked ahead of both PBDAC and cooperatives.

The leadership of the cooperatives has been accustomed to operating in a non-commercial environment and, to date, has paid little attention to such concepts as planning and the cost effectiveness of operations. During field interviews, local cooperative leaders stated that, lacking any directives from their secondary and national bodies or from the government, there is no need to take steps to alter their business operations. Most leaders of the local, district and governorate cooperative organizations visited appear to believe that the government has little choice but to continue its current level of financial and managerial support. They cite as evidence that, as of the present, the government has made no formal declaration of intent to privatize the cooperatives, nor have they been directed to have their cooperatives begin to cover a greater share of their costs.

Inventory control, stock rotation, and the efficient use of assets also raised concerns about the business attitudes of management during the field visits. Several of the cooperatives visited had supplies of old fertilizer in their storage areas, some of which dated back several years. For a private business, this would represent a significant investment that could not be held over a long term. If all of the multi-purpose cooperatives have from 2 to 10 tons of distressed fertilizer remaining in storage, the total would represent a very large value. Much of this stock can still be used if it is remilled and rebagged and sold at market clearing prices. This could be a significant income generating activity for one or more of the national-level cooperative organizations.

Building a Commercial Network – One of the most important assets of the cooperative system is that local societies are located throughout all of the rural areas of Egypt, and this broad network of local cooperatives has the potential of reaching every farmer in the country. Such a network could be employed in both directions, the provision of supplies to the farmers and the marketing of their crops. Used effectively, this important base could give the cooperatives a strong competitive advantage over the private sector retailers, who operate primarily as individuals. If it were efficiently managed and operated, this extensive system could be a strong commercial force for the cooperatives and, at the same time, enable them to serve as an effective balance to private traders.

If the government decides to maintain its current high level of financial support to the cooperatives, some of the local societies have sufficiently strong management that they will be able to continue to provide services to their members and continue to market inputs. Many, however, will simply cease to function or will be able to operate at only a minimal level. If many of the weaker cooperatives are going to survive, they will need to restructure their operations and focus on effectively serving their members.

Member Services – Operational efficiencies and cost effectiveness should also be the concern of all those who work at district, governorate, and national level cooperative organizations.

At present, there are too many levels of cooperative structures to operate efficiently in a competitive market. Cooperative leaders must recognize that each of these levels is a cost center that requires the financial support of the base membership (the farmers). Too often, the farmer-members pay for the complexities and inefficiencies of their cooperative structures in higher prices for inputs or in a lack of services because resources have been used to support an ineffective hierarchical structure. Too often, personnel at the secondary and tertiary cooperative levels are content to pass on their high operating costs to the very producers the system was designed to serve.

Historically, cooperatives are business entities established to enable their members to obtain needed goods and services at reasonable cost. To compete effectively, Egypt's cooperative organizations will need to focus on improving their business operations and improving member services. These are not mutually exclusive concepts. Cooperatives must always balance the need to operate profitably with the interests of their members. Egypt's cooperatives will need to undertake strong, well-planned efforts to rebuild member confidence and loyalty. To do so, they will need to begin to provide tangible, visible member services, including the accurate calculation and prompt payment of patronage refunds.

10.6 CONCLUSIONS AND RECOMMENDATIONS

10.6.1 Clarifying the Status and Role of the Cooperatives

At present, the status of the agricultural cooperatives is unclear. Officials of the MALR and leaders of the national cooperative organizations hold strongly divergent views on the status and the current and future roles of the cooperatives. There is need for the government and the cooperative leaders to establish a clear national policy on cooperatives. Without such a policy, the effectiveness of the cooperatives will continue to decline. To develop a national policy, two basic issues need to be addressed:

The issue of the value and benefits of a strong cooperative sector.

The issue of continued government control and financial support versus full political, administrative, and financial autonomy.

Although the two issues are closely related, the first focuses on the value of the cooperative sector to the country, while the second focuses on the questions of autonomy and self-sufficiency. The first issue is based on two questions: (1) Is there a need for a cooperative sector in agriculture? (2) Are the potential benefits of a well-functioning cooperative sector worth the cost and effort required to build it? GOE and cooperative leaders should confer and decide whether the potential benefits of a strong cooperative sector merit a renewed effort to improve the business operations and management of the cooperatives. Is a continued cooperative role in input distribution and supply necessary? Can the cooperatives serve to provide an important alternative to private traders?

If the decision on this first basic issue is positive, a step-by-step process should be initiated to remove the legal and organizational constraints to cooperatives and improve the business skills of cooperative personnel. If, on the other hand, the response is negative, the cooperatives should progressively become dependent on their own resources and be made to compete on equal terms with the private sector.

On the second basic issue, that of control and self-sufficiency, there are significant differences of opinion between MALR officials and some leaders of the cooperatives, and strongly divergent views among the cooperative leaders themselves. Although there is no unanimity of view in either the ministry or the cooperatives, for the most part ministry officials continue to see the cooperatives as part of government extension services, while the cooperative leaders prefer either full or partial autonomy.[19] Those opting for only partial autonomy would like to see a continuation of government financial support, and even some degree of government protection from private sector competition, while having full administrative independence. Those advocating full autonomy (including full financial self-sufficiency) believe that, with a certain amount of restructuring, improvements in management capabilities and a clear separation of the cooperatives from the agricultural extension services, the cooperatives can compete successfully with the private sector.

A clear decision should be made on whether to continue the current system of government control and financial support for the cooperatives, or give them full political, administrative and financial autonomy. Any decision to give the cooperatives full autonomy and responsibility for their own financing should be followed by the incorporation of the changes into new cooperative legislation and a step-by-step plan to implement the transition.

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19. The agrarian reform cooperatives are a clear exception. Leaders at the national-level (housed in the MALR) indicated a strong determination to maintain the *status quo*, and wanted no association with any movement to make the cooperatives independent of government control and support.

Discussions with cooperative leaders left the impression that they believed a transition from government-supported to autonomous, self-financing cooperatives would be relatively easy to accomplish. They often responded to difficult questions with assurances that there would be few problems, that the cooperatives would be able to compete successfully in a free market, and that farmers would demonstrate a high degree of loyalty to their local cooperative societies. The real issues, however, are practical and business based. One cooperative manager, for example, reported that with the opening of fertilizer trade to the private sector, the volume of his cooperative's fertilizer trade fell from an average of 4,000 mt annually to only 175 mt in 1992. Should the government decide to move cooperatives toward full autonomy and self-sufficiency, there is need for the cooperative leaders at all levels to develop a realistic perspective on what will be required to make the transition and enable the cooperatives to succeed in an open, competitive market.

10.6.2 Improving Management and Operations

Whether the decision is to continue the present system in which cooperatives function as agencies of the government or to require them to become autonomous and self-supporting, if the cooperatives are to continue to operate with any degree of success, there is a need to improve their management and operations. Although the conclusions and recommendations presented in the following paragraphs are of particular importance for an independent, self-financing cooperative sector, they are applicable whatever decisions are made on the issues of legal status and control. Even if government control and financial support should be continued, there is need for the cooperatives to develop a more businesslike approach to their operations.

In the past, the cooperatives filled an important role in the distribution of fertilizer and other agricultural inputs, and in the provision of such services as pesticide application and machinery rental. Although some of these services continue to be provided, a lack of consistency has caused farmers to turn to other sources, and the overall impact of the fertilizer policy reforms on the cooperatives has been to diminish their role in input provision. Once the opportunity was presented, the private sector responded quickly and moved into all levels of the fertilizer trade. The cooperatives, on the other hand, moved much more slowly and, as a result, have largely been left behind. Lacking a planned, unified response to the changes in government policy, the cooperatives lost any competitive advantages they had in fertilizer distribution and marketing.

10.6.3 Improving Business Attitudes

As noted earlier, many of the cooperative managers at the local levels and many of the cooperative officials at the district, governorate, and national levels lack both business experience and a business mentality. Long-term government control and financial support has made it possible for the multi-layered cooperative structures to be maintained with little concern for efficiency of operations or cost effectiveness. For the local managers and staff, government support has meant that they were guaranteed their salaries regardless of their cooperative's profitability.

The ability of their organizations to become competitive, and to survive in a competitive environment, requires that cooperative personnel at all levels modify their attitudes and develop a businesslike approach to their areas of responsibility.

The country's cooperative leaders will need to re-examine their roles and be willing to eliminate non-profitable operations and non-essential layers of cooperative administrative structures. They will also need to be willing to reduce the number of employees at all levels of the cooperative structure to only those absolutely essential to the achievement of the organization's business objectives.

10.6.4 Improving Management

The field visits and other studies of the country's cooperatives revealed significant differences in managerial capacities from one cooperative to another. This was not only evidenced in the business operations observed, but in the condition of the facilities, the accounting ledgers and services available to members. While some managers appeared to be fully capable of operating their cooperatives profitably in a competitive market, others clearly were not. There is a need to provide practical business training to upgrade the capabilities of many of the managers; and there is need to remove and replace those who are not willing to earn their salaries directly from the business operations of their cooperative.

At the local level, the manager is the key employee. Managers who demonstrate the skill to operate the cooperative profitably, while providing a satisfactory level of services to members at competitive prices, should be rewarded with appropriate salaries commensurate with what they could earn in the private sector. Cooperative boards of directors should also consider establishing profitability targets for each year and providing bonuses to the manager and key staff as these targets are attained. The bonus steps could begin at 50% of the annual target level and increase as each profitability benchmark is achieved.

10.6.5 Utilizing the Cooperative Network

While the organizational structure of the cooperative sector gives the impression of a unified, coordinated whole (see Figure 10.1), in practice, there is little coordination either among the different kinds of agricultural cooperatives or among the different administrative levels of each type. This is particularly true with the multi-purpose cooperatives. There is little evidence of adequate information flow in either direction; and, except for the passing along of occasional government directives, the local cooperatives appear to function with little assistance, direction, or coordination from the national and governorate levels.

As noted earlier, one of the most important assets of the cooperative system is its extensive network of local cooperatives capable of reaching all of the country's farmers. To date, the cooperative leaders have not made effective or creative use of this network. In part, this is because the cooperatives have not needed to be concerned about profitability. With almost all staff salaries paid by the government, mandated discounts on agricultural inputs, and exemptions from the commercial tax on inputs, the local cooperatives operate with very low overhead costs.

If the GOE decides that cooperatives must move toward a greater degree of self-sufficiency, including covering the salaries of all staff, the cooperatives will very quickly be faced with the need to become profitable and make more effective use of their resources. The existing cooperative structures could be modified and developed into an effective network to serve both the supply and marketing requirements of the farmers. This kind of base could give the cooperatives an advantage that the individual private sector traders do not have. Effectively managed and operated, this cooperative network could become an important commercial force and serve as an effective balance to private traders.

Cooperative leaders should consider setting up a committee to examine the role and functioning of the cooperatives and make recommendations that are consistent with the GOE's policy of autonomy for enterprises, an enhanced role for the private sector and greater open market competition. With a focus on improving the performance and increasing the effectiveness of the cooperatives, the committee should listen to the farmers and the cooperative managers and seek to identify and eliminate problems and constraints to cooperative business operations.

10.6.6 Improving Cooperative Fertilizer Distribution

Contractual Performance - Several of the factory commercial managers expressed disappointment with the lack of consistency with which the cooperatives acted upon their contracts with the factories. For FY 1991/92, cooperatives contracted with the factories for a total of 459,000 mt of fertilizer (Tables 7.2.3; 7.2.4; 7.2.5), but lifted a total of only 331,000 mt, or 72% of the amount contracted (Tables 7.2.1; 7.2.2). These same tables indicate that, while contracts for FY 1992/93 total 493,000 mt of fertilizer during the first 6 months (July-December), the cooperatives had lifted only 71,000 mt, just under 15% of the total contract amount.

Collaboration on Purchasing - The objective of bulk fertilizer purchases by the cooperatives should be to obtain the necessary supplies at the least cost for their members. At present, some cooperatives purchase directly from the factories, others through the Egyptian Agricultural Organization (EAO) and others from private dealers.

With the 1991-92 season, the Central Agrarian Reform Cooperative (the national level organization) began to contract directly with the factories for the fertilizer requirements of the agrarian reform cooperatives.[20] Based on calculations similar to those once used under the mandated crop system (cropping patterns and official allocation rates), and information about local modifications, each district level society compiles the annual requirements for its territory and submits the order to the national body. The local cooperatives then obtain cash credit via the village banks and purchase their fertilizer supplies from the central organization. Any amounts the farmers need over and above the allocations made by the cooperative must be purchased from private traders. The local agrarian reform cooperatives

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20. Factory lifting records show no orders from the Central Agrarian Reform Cooperative. Most likely the orders are placed through the EAO or with the larger private dealers rather than directly with the factories. The Central Agrarian Reform Cooperative reports that it manages a "stabilization fund for fertilizer" that totals LE 4 million.

assert that they can sell urea at LE 2.00 less than the private sector and are able to price other types of fertilizer at LE 1.00 to 2.00 less than private traders.

There is need to examine the patterns of cooperative fertilizer purchases to determine the most appropriate and least costly means of obtaining and distributing their members' fertilizer requirements. Cooperative leaders at the national and governorate levels should analyze their procedures for the purchase and distribution of agricultural inputs and adopt the least costly means of accomplishing these tasks. This analysis should include an examination of the costs (margins) of the multi-layered cooperative structures themselves.

In addition, the cooperative leaders should give consideration to the development, over time, of a collaborative system of purchasing and distributing inputs that would take advantage of off-season pricing and lower cost storage. To compete more effectively with private fertilizer traders, cooperatives should also consider developing and promoting their own "Co-op" brands of fertilizer and other agricultural products, and providing related advisory and training services to their members.

10.6.7 **Cooperative Competitiveness**

Some GOE officials and cooperative leaders are seeking additional advantages for the cooperatives in the distribution and sale of fertilizer and other agricultural inputs. Some also believe that the cooperatives should be protected from the competition of private traders. Given all of the subsidies and benefits already being provided to the cooperative sector by the government, designating additional public resources and additional protection to the cooperatives to insulate them from private sector competition can not be supported. Such measures would continue to support their inefficiencies and be an unnecessary constraint on the progressive development of the private sector. Just as private sector businesses should not be penalized for the inability of the cooperatives to compete on an equal footing, the cooperatives should not be protected by the provision of special discounts and tax advantages.

At the time this report is being written, Egypt's agricultural sector, including the agricultural cooperatives, is in the midst of an important period of transition. For the cooperatives, there is no unanimity among either government or cooperative officials about the future directions the cooperatives should be allowed to take. Prior to the advent of the current reforms in agriculture, and before the opening of input distribution and supply to the private sector, the cooperatives were accustomed to operating in a non-competitive environment. The current situation provides an opportunity to test the ability of the cooperative sector to respond to private sector competition by becoming more efficient and more effective in their business operations.

10.7 PROVIDING SERVICES TO THE AGRICULTURAL SECTOR

This discussion of Egypt's cooperatives concludes with several comments on another important area in which services to the farm sector can be significantly improved, the government's agricultural extension services. To a large extent, the cooperatives themselves operate as part of the government's overall extension program. The MALR pays the salaries of almost all cooperative managers and has seconded to the cooperatives a large number of other ministry employees who function as extension agents. Once assigned, however, the agents often lack the necessary transport and other support required to be able to work effectively with the farmers.

The MALR's agricultural extension service is a function of the Agricultural Research Center and one of its major objectives is the transfer of the benefits of agricultural research to the country's farmers. The extension service is to provide the linkage between the research and the farmers. This linkage, however, is often very weak. According to a 1984 report and later producer surveys, most farmers indicated that the most frequent and most trusted sources of agricultural information and advice were relatives, friends, and neighbors. The majority of the farmers stated that they had never received a visit from a government extension officer and most had never attended a government-sponsored training program.

Developing an Effective Extension Service–Improving the extension services will require careful planning, investment in training, and providing the extension agents with the transport and other resources necessary to carry out their tasks. There are a number of steps that can be taken to develop a more effective system of agricultural extension:

Simplify and clarify the organizational structure. There should be a clear separation of the cooperatives from the agricultural extension services. In addition to clarifying the roles of both the cooperatives and the extension agents, this will also allow the ministry to obtain a clearer understanding of the costs of continued support to the cooperatives.

Establish clear lines of authority and annual work plans for each extension agent. Once adopted, work programs should be strictly observed.

Eliminate many of the administrative tasks currently assigned to the extension agents.

Through the development of an effective training program, promote close cooperation between extension and research.

Provide the necessary technical support and transportation.

Establish career paths and salary levels commensurate with other sectors.

With the rapid growth of private sector fertilizer dealers at both the wholesale and retail levels, the extension service has additional opportunities to provide training and new channels to pass information to farmers. The scope of the MALR's extension program should be expanded to include the provision of training to private dealers. This training should include fertilizer use and application, and pesticide use (including environmental considerations). Information brochures should be prepared for use by the private dealers, and to enable them to pass along this information to the farmers. The MALR should consider the development of a pilot program to provide extension services and training to commercial traders handling all types of agricultural inputs.

11. AGRONOMIC ISSUES RELATED TO AGRICULTURAL POLICY REFORMS

11.1 INTRODUCTION

Prior to the agricultural reforms, farmers were constrained in making decisions concerning farming operations. All agronomic and economic decisions were set in a framework of a command and control system. With the exception of a few crop production policies that are due to be eliminated in the very near future, farmers are now free to decide cropping areas, cultivation, and cultural practices, and where crops are sold. The advent of cash credit allows freedom of choice for input purchasing. Our studies show that farmers are quickly adjusting to the new system and making their own decisions based on the newly developing market forces. In this process there will inevitably be some mistakes made but this is part of the learning process. Procedures and products which have served in the past need to be re-examined in light of the agronomic and economic allocative decisions making progress now possible.

11.2 FERTILIZERS

11.2.1 **Fertilizer Recommendations**

The MALR fertilizer committee each year reviews the fertilizer recommendations. These are made for the recommended rates of nitrogen, phosphorus (P_2O_5), and potassium (K_2O), for crops, by governorate. The results of all the fertilizer trials in the MALR are reviewed and serve as a basis for these recommendations. In the past, recommendations were used for allocation of fertilizer to the various governorates and for the credit-in-kind of production credit for the farmers. Table 11.2.1 gives the recommendations for the 1988/89 year. A review of the recommendations since the 1980/1981 season indicated that most recommended rates of fertilizer changed very little over this period of time. There were slight increases in nitrogen rates for the major crops, like maize, wheat, rice, sugarcane, and the range of nitrogen rates for vegetables and fruits was widened. There were only slight changes in the phosphorus recommendations and then only for a few crops. Maize did not have a phosphorus recommendation until the 1985/86 season. Potassium recommendations are confined to sugarcane, vegetables, and fruits; other crops having an option of 24 kg K_2O/feddan, if needed by the crop. Table 11.2.2 gives the recommendation for the newly reclaimed sandy lands. There was some slight variation in these rates by governorate.

PBDAC is still using these fertilizer recommendations as a basis for cash production loans. The cooperatives visited in the course of the study were continuing to use the recommendations as a basis for fertilizer orders for their members. There were already indications, before the liberalization of the crop production system, that farmers were not always applying the fertilizer as recommended. Fertilizer was switched from one crop to another, depending on which crop gave them the greatest return. Now that fertilizers are largely unsubsidized and at much higher unit prices, farmers have become more sensitive to their price. Nitrogen use rate has been reduced to some degree (Table 4.3.1), but there has been a greater percentage reduction in the use of phosphorus and potassium than with N. This, in general, is similar to the trend in other countries where subsidies have been removed. It may take some years before farmers again realize that they need phosphorus and potassium at the recommended rates to maintain yields. If the current trend continues there will be an imbalance of nutrients, and response to nitrogen will be reduced.

Government extension and fertilizer dealer programs should be developed to emphasize the importance of a balance of nutrients in fertilizer applications. Fertilizer recommendations need to be become as specific as possible for the individual farmer, relating to his yield goal and management ability. These programs should be conducted at the dealer and extension levels with the farmers.

Soil tests offer another approach to more site specific recommendations. Soil tests are mostly being used in the newly reclaimed lands, which have complex plant nutrition problems on high value crops. The farm size generally is larger than in the Delta. Soil tests are used in the old lands areas on the small land holdings but to a very limited extent.

There are several major constraints to the increased use of soil testing. One is the availability of laboratories. The National Research Center (NRC) has four functional laboratories that can serve farmers. Several of the universities also are reported to have laboratories. The MALR laboratories have been used in the past more for research and are not designed for farmer use. They are often limited by a lack of trained staff and operational equipment. If soil testing is to be used with small farmers, then soil laboratories must be designed to run large volumes of samples, so results can be delivered to the field at a very low cost and in a timely manner. Most soil tests are expensive, because of the number of analyses performed on the sample. A rapid soil test for phosphorus, potassium, and pH, that could be analyzed rapidly in volume, could be delivered to the farmer at a very low cost and prove to be very useful to farmers in determining specific fertilizer needs. This could be used in large areas of the Delta. Complete, more costly, soil analysis can be used only in newly reclaimed areas or where other nutrient differences are suspected. The sample cost is not prohibitive on high value crops. Both fertilizer dealers and extension agents could develop this service for farmers. Pakistan, for example, has companies that have done extensive work on soil testing with small farmers, even teaching them to take the sample soil themselves to reduce cost.

Another less specific, but lower cost approach, could be for the MALR to monitor over time, through soil tests, soil levels of P and K to determine depletion/accumulation rates.

Another approach to nutrient balance is the use of chemical or physically blended fertilizers with nutrient ratios that represent a specific crop's needs within specific soil regions. This concept is at a very early stage of development in Egypt with no assurance that it will succeed in the very near future. Blends for specific crops for an area, that are blended in a central location, have problems in estimation of demand of these products and inventory control. Present inventory costs make market development very difficult. This may be a major constraint to their use in the near future. This is discussed, in more detail, in Section 11.2.2, on work being done on new product development by the Egyptian Fertilizer Development Center (EFDC).

11.2.2 New Fertilizer Products

The United Nations Development Program (UNDP) initiated a project in l988 to develop the EFDC. The project was conducted under control of the Egyptian Ministry of Industry. The United Nations Industrial Development Organization (UNIDO), the executing agency, subcontracted with the International Fertilizer Development Center (IFDC) for this project. The objective of the Center is to improve existing fertilizers and to develop new products. The Center is located at both the Semadco plant site at Talkha and at the Abu Zaabal plant site in Abu Zaabal. The Center is nearing completion with the construction of a large scale pilot plant

(1 mtph) at Talkha. The physical properties and small bench scale phosphorus and nitrogen laboratories have been in operation for some time.

Greenhouse facilities and a soils and plant analysis laboratory allow for the initial evaluation of new fertilizer products. The initial focus of the Center is to improve the physical quality of the nitrogen products, with the possible production of anticaking materials that could be used to reduce the cost of these materials for the local manufacturers. Already in process is the granulation of the concentrated super phosphate at Abu Zaabal. This is being produced at about 100 tpd with a small pilot plant. The reception of this product by farmers has been very good. A small amount has also been exported. A new slurry granulation system will have to be installed at the plant to produce sufficient tonnage to take advantage of this new product. Eventually all of the phosphate may have to be granulated if the early indication of the farmers acceptance is a reliable guide. Granulated products are not only much easier for farmers to handle but can be be spread more uniformly, either by hand or mechanically, thus obtaining better agronomic results.

The Center is also developing new fertilizer products which are being evaluated under field conditions including urea-ammonium nitrate (UAN) solutions. Feasibility studies on UAN production in Egypt are continuing. This product has the highest level of nitrogen in solution (32%). It can be used domestically and several countries have already expressed interest in the importation of this product. UAN can be used for both the row crops and cereals, as well as for drip irrigation systems with high value crops. The present fertilizer production facilities, producing both urea and ammonium nitrate can, with relatively low-cost plant modifications, produce UAN. It is the internal infrastructure to handle the product from the factory to the farm, and not the agronomics, that will determine its future consumption. UAN also offers the production companies increased flexibility with another product line, as excess urea and ammonium nitrate can easily be diverted to the production of this product. Field evaluations are being conducted in conjunction with the MALR. The product is also available for testing by universities and private companies. Marketing studies are in progress to define the potential demand, and private dealers have expressed interest in marketing this product.

The EFDC has also produced diammonium phosphate (DAP) and monoammonium phosphate (MAP) and are testing these materials. These products offer maximum flexibility as sources of phosphorus. They are traded in the international market and are widely used internationally. They can be used as straight products, but are also ideal for use in the physical blending of fertilizers. Availability of good quality materials, of proper size for blending, is a major problem in the early development of physically blended fertilizers in Egypt. DAP and MAP have relatively hard granules that can be produced in a size range that is compatible with other products for blending without segregation.

The other major effort of the EFDC is the production and testing of complex NPK fertilizers, with and without micronutrients. These are both chemical and physical blends. Quantities of these materials can be produced in the 1 mtph pilot plant for field evaluations and extensive field demonstrations. This is in support of the balanced nutrient fertilizers concept that can be applied by crop and area. EFDC is working both with the public sector and private companies in the development of these products.

As part of the development process of the Center the staff are conducting feasibilities to determine the most economically and agronomically sound direction for future production facilities in Egypt. They are finalizing the prefeasibility studies on the most promising alternatives. The production of DAP from the new Abu Tartar phosphate mines, expected to be in operation in the next few years, is under consideration. This product should be introduced into Egypt and tested to seed the market before domestic production begins, so there is a smooth transition of the product into the market.

Market demand for low analysis nitrogen products (calcium nitrate and ammonium sulfate) has decreased since privatization (Table 6.2.2). This decrease in demand may be due, in part, to limited market distribution of the products but the higher cost per kg N compared to urea and AN is the most important factor in this lower demand.

It should be remembered that, previously, farmers had to use those products that were delivered to them and the factories that produced these products were operated at full capacity. The economics of factory operations was of greater concern than what the farmer may have wanted. Although there may be agronomic reasons for the use of some ammonium sulfate and calcium nitrate, the farmer may choose to substitute other products for these. Although, traditionally, ammonium sulfate has been used on rice, urea properly applied and incorporated into the soil, produces just as high yields according to MALR field trials.

The National Research Center (NRC) is also working on the development of liquid foliar fertilizers. These will be developed with a small-scale pilot plant, soon to be in operation. This Center is involved with a program of crop consulting directly with farmers. These products will be evaluated in their experimental fields and with their farmer clients.

The Center for Metallurgical Research and Development Institute continues to work on phosphate rock beneficiation as it relates to the phosphate industry.

In 1958, the GOE opened up the importation of foliar, soluble NPK fertilizers, with or without micronutrient additions. Several hundred materials were registered by the government but many of these products were not sold in the country at that time as they were still competing with subsidized fertilizers. There is an increasing need for soluble NPK for drip irrigation systems and for micronutrients. EFDC is investigating blending soluble NPKs and the local production of zinc fertilizers. Zinc is the most widely needed micronutrient fertilizer in the country. A number of private companies are now either producing, or planning to produce, soluble fertilizers for drip systems. This is essentially the blending of some local and imported materials, although, generally, only the nitrogen for blending is produced locally. As the demand for these materials grows, local production of the base materials should be encouraged.

Research and development work on UAN, DAP, MAP, KCl, KNO_3 and NPK fertilizer should be speeded up and all of these products should be registered for use in Egypt. The registration of new products with the MALR is normally not a major problem. With freedom of choice and market prices prevailing, new product demand will be determined by the market. If products do not sell domestically, factories are forced to look to market clearing prices or modifying production to other products. If specific products are needed agronomically, then the MALR needs to launch a campaign to promote the use of these products. Often farmers can and will substitute products at a lower cost with little agronomic effect.

11.2.3 Potassium Fertilizers

The present source of potassium fertilizer is imported potassium sulfate. Potassium sulfate has been and still is highly subsidized, although all subsidies are to be removed by 1995. To date, the removal of subsidies has already had an impact on use of potassium sulfate by farmers; demand has fallen by 50%. The PBDAC stocks at the end of 1992 remained at just under 40,000 mt. In the meantime, the need for potassium by certain crops and soils continues to increase. The increase is caused by:

1. The number of years since flooding and deposition of soil has been eliminated by the construction of the High Dam.
2. Increasing yields of some of the major crops, arising from higher yielding variety introductions, have increased crop needs for potassium.
3. The reclamation of sandy soils in the new land areas and production of high potassium demanding crops of vegetables and fruits.
4. An increase in the export of vegetables and fruits which require potassium to maintain product quality.

In order to meet these increasing needs for potassium, a more economical source of soluble potassium fertilizer is required by the farmers for both drip irrigation and soil application.

Potassium nitrate, a major component for soluble fertilizers used in drip irrigation systems, has been banned from import for strategic reasons. Importation of potassium nitrate for the production of soluble NPKs for drip irrigation systems within the country would avoid the importation of the very costly final products. Since the domestic production of ammonium nitrate no longer has calcium added, the ban on potassium nitrate should be reviewed. Potassium chloride has been banned from import and use because of the perceived problem of increased soil salinity from its use.

The scientific reasons for the use of potassium chloride and the implications regarding soil salinity are given by IFDC soil scientists. The views are agreed with in principle by a soil scientist and fertilizer expert from the MALR Agricultural Research Center (ARC) and plant nutrient experts of the NRC. This discussion is presented in the following paragraphs.

The development of salinity in irrigated soils is of major concern, particularly in arid regions, because of high evapotranspiration, that concentrates salts, and the lack of rain to leach salts from the soil profile [6]. Salts originate from soil parent material, fertilizer additions and natural deposition, particularly near coastal areas. Salts in soils have two major effects on both plants and soils:

1. They increase the osmotic pressure of the soil water, making it more difficult for the plants to take up water.
2. They can cause soil clays to deflocculate, which destroys the soil structure, and causes the soil to become less permeable to water, which compounds the salt accumulation.

All soluble salts have these effects, but there are differences between cations in their effects on the deflocculation of clays. In this regard, Na causes soils to deflocculate much more than the divalent cations of Ca and Mg. Therefore, in irrigation waters and in irrigated soils, the amount of Na relative to Ca plus Mg is very important. If Na becomes highly concentrated relative to Ca plus Mg, the soil can become impermeable and salts cannot then be leached out in drainage water. There are a number of interacting effects that determine the salt balance of a soil and whether or not salts accumulate in the soil to the detriment of production [1, 3, 6]. These include: the quality of the water, the water evapotranspiration rate, the amount of water applied in excess of plant needs, the divalent cation additions in fertilizers, and the drainage of the soil.

Osmotic pressure, essentially, depends on the total number of anions and cations in soil solution, not on the charge (valence) of the ions. Therefore, the osmotic pressure developed by the addition of equal amounts of K is slightly different between K_2SO_4 (sulfate of potash [SOP]) and KCl (muriate of potash [MOP]) addition, since two K atoms are received from SOP, with a total of three ions; while with MOP, two K atoms are received in four total ions, or one-fourth less osmotic effect of SOP than MOP (3 relative to 4). Therefore, in absolute terms, it can be said that SOP causes less salinity in soils than MOP, particularly if the difference in plant uptake of sulfate and chloride (Cl) is considered.

Having said this, however, consideration must be given to the amount of Cl added in a MOP relative to other sources of Cl in irrigated soils. A cotton crop in an arid environment will use approximately 70 cm of water or 7×10^6 L/ha during the growing season, while wheat might use 45 cm or 4.5×10^6 L/ha. All of the salts applied in water to the soil remain in the soil unless taken up by the crop (mainly nitrate, sulfate, and potassium) because the plants transpire pure water, leaving the salts behind.

The Cl and salt contents vary in the Nile River, depending on the season, total flow, and location. Salts become higher in concentration as the river flows to the sea. The range in Cl concentration in the Nile River in 1977 was 0.55-1.95 milliequivalents/L or 20-70 mg of Cl/L (Balba, 1979).

Thus, for cotton, from 1.4×10^9 mg of Cl (equivalent to 140 kg) to as much as 490 kg of Cl will be added per hectare with each crop during the growing period from the irrigation water. With a wheat crop, the amounts might range from 90 to 315 kg of Cl. An application rate of 100 kg K_2O per ha (a high rate of K_2O for crops other than bananas or sugarcane) as MOP would add 79 kg of Cl. Therefore, even considering the lowest Cl content, with the crops requiring the lowest amount of water, the amounts of Cl added in MOP are much less than the amounts added in good-quality irrigation water.

Others have come to the same conclusion after making a calculation of salt balance [9]. The contribution of MOP fertilizers to the salinity of soils is not considered in the texts on salinity because it is negligible [1, 8]. Annual Cl deposition normally ranges from 10 to 40 kg/ha, or as high as 100 kg/ha Cl in coastal regions.

The question then arises that if the above is correct, why did Algeria, Egypt, and Pakistan [6] develop recommendations that SOP be used instead of MOP. The answer appears to be rooted in the following:

1. Chloride-sensitive crops, particularly citrus and horticultural crops are important in these countries.
2. There was concern that MOP would be confusing for farmers to distinguish from SOP, and fraud might result.
3. There may have been a misinterpretation of the significance of the "salt index", which is about twice as high for MOP (1.94) than SOP (0.85). These numbers have significance when relatively high amounts of the fertilizers are applied with seeds, but they have no significance when fertilizers are otherwise applied to

soils. One needs to keep in mind that there are over 2 million kg of soil/ha in a plow layer of 17 cm thickness. The addition of something like 100 kg of chloride to 2 million kg represents a dilution factor of 20,000.

4. Chloride concentrations and the salinity of waters are usually closely related because Cl is such a common, naturally occurring anion. Therefore, Cl became associated with salinity.

Several literature sources make short statements that SOP is a preferred source of MOP on irrigated that are lands prone to salinity problems [7, 10], but the basis for the statement is not presented.

Based on this evaluation, and the evaluations of others [9], it can be stated that fertilizer rates of MOP will contribute an insignificant amount to the problems associated with salinity. The adverse effects of Cl on horticultural crops and citrus should not be ignored, however, nor should the nutrient benefit of the sulfate content of SOP for soils deficient in sulfate. It would be more likely that additions of Ca in SSP, or more use of gypsum, could benefit soils more than the use of SOP instead of MOP.

The potassium sulfate will need to continue to be imported for chloride sensitive crops like potatoes and citrus.

There continues to be wide disagreement amongst researchers in Egypt concerning the use and source of potassium. Only a limited number of field evaluations have been made in comparing potassium chloride and potassium sulfate. Data showed equal performance from the two materials. The use of potassium chloride in Egyptian agriculture was supported in 1992 at a conference examining agricultural strategies for the 1990s (Hamissa, 1992).

As part of the recommendation to allow the importation of potassium chloride, the ARC should increase field evaluation work in the comparison of potassium sulfate with potassium chloride with in field measures of salinity to be convinced that potassium chloride does not provide a risk to Egyptian soils. Also it is recommended that a conference be held in Cairo in conjunction with the International Potash Institute to review all potassium fertilizer and plant nutrition work in the region.

11.2.4 Calcium Nitrate

Calcium nitrate is a very old fertilizer product containing both nitrate nitrogen (15.5% N) and soluble calcium (19% Ca). Traditionally, in Egypt it has been used on on vegetables and fruits, largely in the Delta region. It is not a very good nitrogen fertilizer for the newly reclaimed lands, since the nitrate is rapidly leached with irrigation in the coarse textured soils away from the plant roots. Before the agricultural reforms the price of a kilogram of nitrogen was averaged out over all nitrogen products so farmer paid the same for nitrogen regardless of the product. Because, during that time period, there was a shortfall of nitrogen in the country, all fertilizer production plants operated at full capacity and farmers preference for products were less considered.

Now, when fertilizer prices are more comparable to international prices, the real cost of a kilogram of nutrient for each product is being revealed to farmers in the retail prices. Suddenly, calcium nitrate, as a source of nitrogen, is very expensive compared to other nitrogen sources (Table 7.5.7) and demand has fallen.

Egyptian soils are well supplied with calcium and there are a few crops such as peanuts, watermelons, and citrus that grow best when supplied with highly available levels of calcium.

There has been a reduction in the demand for calcium nitrate since private dealers took over distribution. The calcium nitrate plant presently is operating at only 25% of capacity. The reduction in the use of calcium nitrate is most probably due to the relatively higher cost of nitrogen, with the farmers substituting ammonium nitrate. The local calcium nitrate is subject to adsorption of moisture, causing a poor quality product. It is evident with other products that farmers are much more sensitive to poor quality in fertilizers than is commonly acknowledged. The other reason for some of the reduction had to do with the limited number of distributors the factory assigned to handle this product, thus causing unavailability of the product at many retail locations.

If the factory finds the production of calcium nitrate no longer profitable, it can convert to other more profitable manufacturing processes without harm to Egyptian agriculture. If that happens, import tariffs should be removed to allow import of the small amounts of calcium nitrate that are needed for the special crops indicated above.

11.2.5 **Micronutrients**

The agronomic picture of micronutrients is a very confused one. When the GOE allowed the registration and importation of soluble NPK fertilizers, with and without micronutrients, major problems ensued. Several hundred compounds were registered. Farmers were not ready to use these new foliar-applied materials wisely, as little testing had been done neither had recommendations been made by the MALR as guidelines for their use. Products were used indiscriminately. The high cost of these materials, together with the mixed results obtained, caused these materials to loose much of their demand. At the same time, the NRC was starting work to determine the actual need for micronutrients through soil and plant analysis. Laboratories were developed to handle farmers' samples and make precise recommendations for micronutrients. This work was especially needed in the new lands, where micronutrient deficiency can be a major constraint to plant growth, let alone high crop yields. More laboratories that serve farmers are needed to help identify micronutrient needs on a farm-by-farm basis. In the old lands, micronutrient mixtures for crops by area may have to be developed in order that dealers can easily market the correct micronutrients to the farmer. This concept is in the very early stages of development.

For many years, the PBDAC had imported around 1,000 tons of zinc sulfate annually. This material was used almost entirely on correcting zinc deficiencies in rice. It was applied in the nursery stage to the roots, prior to transplanting. This is a very cost-effective method of treatment. The cost of material for recent tenders was LE 2,000/mt. It is not known who will replace the PBDAC in importing and marketing this material. The 1993 PBDAC tenders for $ZnSO_4$ were canceled and zinc sulfate stocks at end of July 1992 were down to 295 tons. Private companies will have to assume this responsibility. The micronutrient market, under the private sector, needs to be developed on a rational basis; defining the deficiencies and then developing products to correct the problem.

11.3 PUBLIC RESEARCH AND EXTENSION

11.3.1 **Research**

Crop production research in the public sector has many capable, well-trained scientists. They need to continue to work on production issues, such as new variety development and cropping systems, with better product integration and economic concerns. As the private sector increases its research efforts, the public sector will have to be more open to its needs and interests.

Many of the researchers in the public sector have been less than productive, often because of the lack of sufficient support money for equipment and travel to the field. Better defined linkages with extension, so that the researchers can see the direct application of their efforts, will be required. As more private company products come on the market more effort will also be needed, to evaluate different products in the field, and to supply this information, in a timely manner, so that farmers are in a better position to make sound use decisions. It is clear that real crop improvement successes come when the efforts of research and extension are closely linked. Making this linkage is a major challenge for both parties. Research will need to be more concerned with crop quality and how it affects market values then it has been in the past.

11.3.2 **Extension**

The government extension service, which resides in the Agricultural Research Center (ARC), has, in the past, served both as a governmental control agency and a technology transfer agent. As is commonly found around the world when extension has both a technology transfer and government control role, it does not function very well as a technology transfer agent. This appears to be the case in Egypt. Again, lack of real support in the field leaves the extension service ineffective. As the control agent role is disappearing, to be of any value, the extension service will have to redefine its role in agriculture. Extension agents will need a better understanding of products and product use and be able to explain these aspects to farmers. They will also need to work more closely with farmers in their new challenge of marketing their own products. All of this will require additional training and redirection. To survive, the extension service must reorganize to eliminate fragmentation of administration and implementation both at the national and local levels. There needs to be clear linkage with research. An example of real success in this type of linkage was the Egyptian Major Cereal Improvement Project (EMCIP), where the research and extension were linked together in a national campaign to improve the production of maize, sorghum, and wheat. Sufficient funds for demonstrations and work in the field were made available to accomplish the goals. Unfortunately, when this program ended research and extension reverted back to their old, separate ways of operating. In addition, the extension agents will have to work more closely with the emerging agri-inputs dealer.

This should be viewed as broadening the role of the extension agent. It is understood that an extension service reorganization is being planned. Unless the extension agent is given sufficient salary and field support to do his job, and the weak agents eliminated, it is unlikely that the service will improve. Strong extension and dealer systems, working together, would greatly enhance the further technological development of Egyptian agriculture.

11.4 PRIVATE RESEARCH AND EXTENSION

11.4.1 **Research**

As private companies are given more freedom to operate and market within the country, there will be increased efforts on research. Companies will increasingly do their own research and may also be willing to support contract research and development efforts in collaboration with the public sector. Closer working relations between these two complimentary group needs to continue to improve and develop. Additional private research will contribute to the overall research efforts for the countries agricultural sector.

11.4.2 **Extension**

The newly emerging agri-inputs dealer can develop a role in providing extension information to the farmers. Since the dealer is usually the last person farmers come into contact with before buying a product, strong dealer development programs have proved very beneficial to agriculture in many countries. Dealers are viewed not as replacing extension agents but as reinforcing their activities. Private companies cannot provide all the extension services themselves. It must be a combined public-private effort. A recent example of this, in Egypt, is the introduction of NPK blended fertilizer. Because this is only a private sector effort, it is proving very difficult for the company concerned to establish these products as a viable form of fertilizers. Unless extension can support such an effort, companies are often reluctant to enter these markets, where the whole development effort is left to the private sector.

11.5 ENVIRONMENTAL ISSUES

Three major environmental issues affecting agriculture are recognized in relation to the policy reforms: salinity, overuse and/or, unbalanced use of nitrogen fertilizers for crop production, and possible over use of pesticides. The impacts of potassium chloride use on salinity, extensively discussed in Section 11.2.3, are minor compared to the effects of overwatering. Because policies and technology in relation to irrigation are beyond the scope of this study, the following comments relate only to the last two of these three issues.

11.5.1 **Nitrogen Fertilizers and Nitrate Levels**

The study team was informed of recent water quality tests indicating nitrate nitrogen levels of over 100 ppm in some village wells, more than double the EEC and U.S.A. acceptable standards of 50 ppm for groundwater nitrate nitrogen. Excess leaching of nitrate nitrogen into groundwater usually arises from either inefficient uptake of fertilizer nitrate nitrogen, or from excessive quantities of animal manure applications, or from contamination of groundwater by animal manures.

The introduction in recent years of new, higher yielding varieties will have increased the efficiency of crop utilization of nitrogen fertilizers. However, the current replacement of phosphate and potash fertilizers by nitrogen fertilizers, and the ensuing imbalance in crop nutrition will exacerbate the problem. There are no economical solutions, such as through the use of slow release fertilizers or nitrification inhibitors, for this situation. The resolution lies in better site specific application rate recommendations that are matched to yield potential and farmer management ability, and in balanced crop nutrition.

Because phosphorus moves very little in the soil, environmental problems (eutrophication) caused by excessive phosphorus in surface waters are normally associated with soil erosion. This is not a significant problem in Egypt's traditional agricultural areas.

11.5.2 Pesticide Use

Overuse of pesticides by farmers, now that they have more freedom to apply these themselves, can create potentially serious environmental hazards. Also, the general community's perception of indiscriminate sale and use of pesticides may be heightened by the policy changes enacted. It is therefore recommended that the MALR should take speedy and appropriate actions to implement the training recommendations advocated for private sector applicators and take additional steps to educate farmers in the safe use of pesticides. Manual and biological methods of pest control have been encouraged in the past as alternatives to chemical pest control. With the increased, unsubsidized cost of pesticides, farmers, the economy, and the environment will benefit from accelerated action on integrated pest control.

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12. FERTILIZER DEMAND PROJECTIONS AND THEIR IMPLICATIONS

Demand for fertilizers is derived from the demand for agricultural output. In the framework of production theory, agricultural production is a function of (depends upon) the use of various inputs, and may be written:

O = f (X , T), where
O = agricultural output
X = a vector of n production inputs (i = 1, 2, 3, ...n)
T = Production technology embedded in production inputs, (for example varieties, fertilizers, pesticides, etc.) and also dependent upon management. T thus represents over time shifts in the production function due to improvements in technology.

Farmers produce agricultural output to make a living by earning some profit out of their production activities. The profit may be written as:

p = Po O - Pi X i which is transformed to

p = f (Po, Pi, Xi, T), that is a function of

output and input prices (Po and Pi), the use levels of inputs Xi which shifts over time with changes in technology (T).

In order to carry out the process of production, inputs Xi are required (or have a demand) which for individual inputs may be written as:

Xi = f (Po, Pi, T), that is, the demand for an input Xi depends upon output and related inputs' prices and upon the level of technology and, over time, it shifts with shifts in technology.

Fertilizer demand is demand for plant food nutrients, the main ones of which are N, P_2O_5, and K_2O. In order to obtain statistical estimates for their demand, over time, yearly consumption data are used along with nutrient prices and agricultural output prices summarized as the agricultural price index. Over time, changes in crops, crop areas, new lands, cropping patterns, and advances in agricultural technology influence the demand for fertilizer nutrients. For this reason, nutrient consumption has been growing.

There has been a tremendous technological advance in the form of varietal improvements for wheat, rice, maize, vegetables, and fruits. Tables 12.1, 12.2 and 12.3 show the rates of the advancement of technology for wheat, rice, and maize crops, respectively, as percentages of crop area planted to new (improved) varieties from 1979/80 to 1990/91. These data show a real advance in modern crop technology in Egypt during this period, because of which, fertilizer use has been continuously increasing. Similar improvements have also occurred in vegetable and horticultural crops.

Because of the difficulties of including these data directly as explanatory variables in statistical estimations of nutrient demand functions from time-series data, the trends in technological changes are usually represented by a time trend variable. On this basis, for purposes of projecting fertilizer requirements for the near future years, the following equations were estimated:

(1) $\text{Ln } Fi = a + c\,T$, where

$Fi = N, P_2O_5, K_2O$ and $(N + P_2O_5 + K_2O)$ and
T = time variable 1979/80 to 1990/91 (1, 2, 3, ..., 12)

This semi-log time trend equation is commonly used to calculate growth rates and make projections for the near future as a rough guide. Over longer periods of time, projections made from this equation are generally on the high side because of the exponential growth pattern involved. Results are presented in Table 12.4. Growth rates for longer time periods 1979-91 and 1975-91 are also presented in Table 12.6.

(2) $\ln Fi = a + b \ln (Pi/Po) + c\,T$

where
- Pi = the actual nutrient price
- Po = Agricultural output price index
- b = price elasticity[21]
- c = annual growth rate

This equation in addition to the time-trend variable includes prices of N, P_2O_5, and K_2O and the agricultural output price index to deflate the nutrient prices. Preliminary estimates of these operations indicated that only the own price effects were important. The estimates presented in Table 12.5, therefore, include only the own price and the time-trend variables.

Note: The data used in estimating equations (1) and (2) above are presented in Table 12.7.

In Tables 12.8, 12.9 and 12.10, projections of consumption requirements of N, P_2O_5, and K_2O are presented for the period 1991/92 to 1999/2000. Table 12.8 is based only on the trend growth rates calculated from the double-log estimates of equation (2), presented in Table 12.5, and represent the lower limit estimates of projections. The medium projection estimates in Table 12.9 are calculated from the estimates (Table 12.5) of the same double-log equation, but including the intercept and the price terms. The high estimates of Table 12.10 are based only on the semi-log trend growth rates shown in Table 12.4.

These low, medium and high projections are summarized below in Table 5.

21. Price elasticity means the responsiveness of fertilizer consumption to the price changes, and is equal to the percentage changes of fertilizer consumption relative to the percentage changes of price.

Table 5. High, Medium and Low Total NPK Consumption Projections

Year	High	Medium	Low
	(mt)		
1992	1,179,873	1,114,820	1,093,893
1993	1,234,062	1,155,892	1,133,470
1994	1,290,739	1,198,476	1,174,479
1995	1,350,020	1,242,630	1,216,972
1996	1,412,023	1,288,410	1,261,002
1997	1,476,873	1,335,876	1,306,625
1998	1,544,702	1,385,092	1,353,899
1999	1,615,647	1,436,120	1,402,883
2000	1,689,349	1,489,029	1,453,639

It is important to realize that the projected requirements are based on the assumption that the past trends influencing the growth of technology continue in the future and the past growth rates of expansion of cultivated and crop areas do also. If during some year(s), there is a different rate of change in any of these factors, there could also be deviations in the projected requirement estimates. For this reason, special government programs to increase cultivated areas by adding new lands should temper the estimated requirements, and adjustments should be made accordingly. In a market based private system of marketing, this points to the importance of information being available in the market. Any special plans to expand cultivated areas and the introduction of new crop technology, etc., should, therefore, be well publicized to enable the market participants to prepare to adjust to the new conditions.

By and large, the projected requirements appear to be quite realistic. Some differences in the past regional pattern of N, P_2O_5 and K_2O consumption are presented in Tables 12.11 and 12.12. This information can be useful to the private sector distributors, wholesalers, and retailers in planning their operations. Some data on how past fertilizer use recommendations have increased over time is shown in Table 12.13. The increases indicated in this table support the sum of projected requirements.

13. FUTURE TRENDS IN FERTILIZER USE

13.1 FERTILIZER PRICES

Given that the recommendations on ex-factory pricing (Sections 6 and 15) have been adopted, Egypt's fertilizer prices will align themselves more closely to international price levels. Therefore, the future trends in international pricing levels will provide the benchmarks for Egypt's domestic pricing, and as such, will influence the level of demand. With the exception of potassium sulfate, all fertilizer prices in Egypt are now unsubsidized, and domestic factory production factors are at market prices; therefore, no further large cost and price increases are anticipated.

International fertilizer price movements are notoriously difficult to predict but overall trends can be ascertained from the expected aggregate and regional supply demand balances. In the latest World Bank/FAO/UNIDO/Industry Working Group forecasts of supply demand balances (World Bank Technical Paper No.176, June 1992), a tightening supply demand balance for nitrogen fertilizers is predicted for the mid-1990s, but phosphate and potash fertilizers are expected to remain in a substantial surplus supply situation for at least the next 6 years.

The tightening nitrogen balance situation is, however, open to interpretation. The Working Group forecasts were essentially based on the assumption that domestic demand for nitrogen fertilizers in Eastern and Central Europe and the Former Soviet Union (FSU) would steadily recover over the next 5 years, reducing supply availability to the international market. Since the forecasts were made, there has been little evidence to support these assumptions. Nitrogen production and nitrogen fertilizer consumption in Russia both continue to decline. Total nitrogen production in the FSU fell by 3.3 million mt between 1988 and 1991 and agricultural consumption by 4.5 million mt (39%) over the same period, (Alienov, 1993). Further reports (Maene, 1992)[22] have indicated that consumption in 1992/93 continues to decline. As a result, FSU exports of ammonia and urea continue to increase, reaching 38% and 30%, respectively, of the international trade in these commodities in 1991/92. These increasing export supplies from the FSU are continuing to depress international price levels.

22. L. Maene, International Fertilizer Association, personal communication, 1992.

Additional factors influencing international price levels for nitrogen fertilizers include the import demand in India and China, the two largest fertilizer importers in the world, and the declining or static demand in Western Europe and North America. Despite increased domestic production of nitrogen fertilizers, with plants under construction or planned, both India and China will remain the largest nitrogen importers, able to influence international prices downwards for the next 5 years or longer (Gregory, 1992). It can be expected, therefore, that international nitrogen fertilizer prices will not increase significantly over the next 5 or 6 years and, in real terms, will continue to fall. Egypt's farmers will not, therefore, be faced with significant nitrogen fertilizer price increases, a forecast which supports the projections presented in Section 12 on future demand.

The international prices for potassium fertilizers will remain depressed. Most use and international trade, however, is in potassium chloride and not potassium sulfate. The more limited supplies of potassium sulfate, compared to potassium chloride, make it less likely that international prices for this product will remain depressed and price increases could occur over the next few years.

13.2 CHANGES IN PRODUCT MIX

13.2.1 Major Products

Recommendations relating to market clearing prices and changes in the ex-factory contract system to increase the number of distributors and market coverage will influence the nitrogen product mix. In 1991/92, not only was there a swing in demand from urea to AN (influenced, no doubt, not only by price and availability, but also by the decree curtailing urea use on cotton) but there was also a marked fall in the demand for CN and AS due to the full cost pricing of these products (Table 6.2.2). During the 6 months to December 1992, these changes accelerated, with CN and AS market shares (approximately 2% and 4%, respectively) falling to approximately 50% of their 1991/92 market shares. Only with market clearing prices for these products, will total demand for them increase. At market import costs for AS, the historic level of demand for this product may not be recovered, as its cost per kilogram of nitrogen will remain above that of AN. This will determine the export availability of urea and AN in the next 2 years.

The lack of a market clearing price strategy influenced the demand for SSP in 1991/92. However, sales in the 6 months to December 1992, approximated 900,000 tons, on an annualized basis. This may be an indication that current ex-factory price levels are very close to market clearing levels and that demand recovery is already well under way. The situation with CSP is less clear. Despite a market clearing price strategy, which is providing a lower cost per kilogram P_2O_5 than for SSP, 1992/93 demand for CSP is less than 10% of recent historical levels. Wider distribution, particularly to Upper Egypt, should influence the demand for this product. If not, the price should be reduced further.

The significantly reduced demand for potassium sulfate, which is considered to be at a critical stage, is being influenced by its distribution being restricted to only the PBDAC system. Removal of its subsidy, which will increase the farm price from LE 380/mt to approximately LE 1,000/mt, and allowing the private sector to distribute it, will not significantly increase the demand due to the very large price increase (from LE 0.79/kg K_2O to LE 1.91/kg K_2O). In addition to the agronomic arguments advanced in Section 11 for the use of potassium chloride, the unsubsidized cost of potassium chloride, based on current international price levels, would only be LE 0.98/kg K_2O. Allowing importation and distribution of potassium chloride, as recommended, would lead not only to some recovery in aggregate potash demand, but also to a significant market share of the potash market for this product.

It is therefore recommended that imports of unsubsidized potassium chloride should be allowed and the subsidy on potassium sulfate be progressively removed over three years and the private sector allowed to distribute the subsidized sulfate. This can be accommodated by allowing the private sector distributors to buy the product ex-port at a net subsidized value from PBDAC. When potassium chloride imports start the administered retail price for potassium sulfate should be increased to LE 480/mt which will make its value per kg K_2O slightly higher than that for unsubsidized potassium chloride. The subsidy on potassium sulfate should then be halved the following year and removed in the third year.

13.2.2 Minor Products

The use of soluble NPK fertilizers for drip irrigation systems, that are either imported or manufactured in Egypt, is difficult to assess, but is considered to currently be around 3,000 mt/annum. Most drip irrigation systems use some limited form of fertigation, usually applying nitrogen, but the total application of all nutrients through irrigation systems is limited to high value crops. Product costs ranging from LE 3,000 to LE 4,000/mt limit use to well-managed systems growing high yielding, high value crops, usually fruits and vegetables for export markets.

The potential demand for these products could be as high as 40,000-50,000 mt/annum based on the use of 50 kg/feddan on 1.7 million feddans of new lands having the potential to use drip irrigation systems. The actual market could grow to approximately 10,000 mt in the next 5 years, but such growth is entirely dependent on the development of export orientated, high value cropping farm enterprises in the new land areas.

13.3 SEASONAL DEMAND

The peak fertilizer demand periods in Egypt are during the months of May, June, and July for the summer crops and November and December for the winter crop season (Table 13.3.1). There are quite distinct differences in the seasonal demand patterns between the three regions of Upper, Middle, and Lower Egypt and between nitrogen, phosphate, and potash demand seasonalities (Tables 13.3.2, 13.3.3, and 13.3.4 and Figures 13.3.1, 13.3.2, and 13.3.3). These differences reflect the differing cropping patterns between the regions. Peak demand months as percentages of annual demand are higher in Lower Egypt than in the other regions. This adds to the supply distribution problems and requires inventory building to meet these peak demands. This information was circulated by the PBDAC to the private sector distributors and dealers in 1992 and is essential information to plan delivery and inventory requirements.

13.4 IMMEDIATE PRODUCT DEMAND

Using the monthly sales patterns from 1990/91 as a guide, it is calculated that 46% of the total sales occur during the July-December period. By applying this ratio to the sales that have occurred in the July-December period of 1992, an estimate of the total and monthly demand to July 1993 was calculated. Table 13.3.5 presents a comparison of factory liftings between July and December 1992 with total liftings in 1990/91 and 1991/92. During the first 6 months of 1992/93, factory liftings were almost 55% of total 1991/92 nitrogen liftings and 50% of the previous phosphate liftings, indicating an increase in demand for 1992/93. Applying the actual product mix for the July-December period 1992 to the second half of 1992/93, estimates were calculated of individual product demand by month from January to June 1993.

These estimates were then matched to maximum monthly dispatch capacities at each plant. This analysis indicated that during the May and June 1993 period, AN dispatches will not be able to match expected demand. Distributors, dealers, and farmers will be forced to accept either additional urea or AS (if the PBDAC imports AS). It was also estimated that the total annual import demand for AS, based on the current product preferences of farmers, would be no more than 150,000 mt.

14. THE FUTURE SHAPE OF COMPETITIVE AGRI-INPUTS MARKETING

14.1 SUPPLY AND DEMAND

The need for increased nitrogen and phosphate supplies is illustrated in Table 14.1.1. The comparison of existing domestic supply capacity with the conservatively projected demand shows deficits in the domestic supply, except for nitrogen during the 2-year period 1993/94 and 1994/95, even with full capacity utilization. The need for continued imports, until increased demand justifies new capacity investments, is obvious. This supports the recommendation to remove import tariffs.

Aggregate domestic supply of nitrogen and phosphate fertilizers, to meet the predicted continuing growth in domestic demand, will increasingly depend on the expected rates of return at international price levels from new investments. Improving the cost efficiency of the Kima plant should remain a priority for the GOE. Conversion to natural gas feedstock, when available, or reliance on imported ammonia, combined with increased capacity, may prove to be an attractive route for a privatized Kima plant. The feasibility of privatizing the nitrogen production companies needs to be studied, prior to such investments being made. While such an approach to future supply potential may reduce the value of asset sales to the GOE, the short-term loss may be off-set by long-term gains arising from faster efficiency improvements with beneficial results for farmers and the economy in general.

The domestic resource costs of the existing phosphate industry need to be studied. Given that the expected international prices for phosphate fertilizers are likely to remain depressed for some considerable time, the potential for privatizing the phosphate companies may not be good; and their continued operation in the public domain as import replacement producers may not be the best utilization of domestic resources. Also, the possible development of the Abu Tartar phosphate deposits and associated world scale export oriented phosphate production should be examined, as such a development would also impact on domestic supply availability.

14.2 DEVELOPMENT OF MARKET CHANNELS

The three market channels (private sector, cooperative, and the PBDAC), currently in place can be expected to develop into only two major channels, following the complete withdrawal of the PBDAC from fertilizer distribution. Within the two remaining channels it will be important to increase the number of participating distributors. After the recommended 2-year period of maximum lifting restrictions, competition could lead to about six major national distributors, lifting and distributing, on average, about 250,000 mtpy; and up to about forty regional distributors, lifting and distributing, on average, about 30,000-35,000 mtpy.

The above projections assume that the cooperative sector will be able to maintain around a 20% share of the national market. As discussed in Section 10, the cooperative sector needs to make many changes in order to be able to achieve this objective. Among the recommendations made, the need to reduce the number of levels of cooperatives (and thus the commissions taken) participating in fertilizer distribution is important. In Figure 14.2, illustrating a projected organization of the future marketing system, the general (apex) level of the cooperative sector is omitted, leaving either the governorate or district level cooperatives only to participate in fertilizer marketing. If the recommendation that the cooperative sector should not be exempt from commercial tax is accepted, then the elimination of the general level of cooperatives will be a necessary requirement to enable the cooperatives to compete with the private sector.

The full return of the cooperative storage facilities from the PBDAC will also be required to enable the village cooperatives to draw supplies from district or governorate cooperatives, which will be acting as the equivalents of the private sector wholesalers. The village cooperatives should also abandon the current practice of estimating members' fertilizer needs by using the old quota system calculations. The complete fertilizer requirements of members should be ordered and distributed to provide full service to members. If this practice occurred with all cooperatives, the total fertilizer needs of all farmers could, in theory, be met by the cooperative sector. This, of course, will not happen in practice due to the lack of member loyalty and the inability of many smaller cooperatives to manage fertilizer distribution.

It can be expected, therefore, that there will be an increase in the distribution of fertilizer to the cooperatives by the national and regional private sector distributors. Similarly, any development of private sector mandoubiahs will use the services of the private sector distributors and wholesalers to secure supplies.

The advent of privatized production companies could lead to the development of production company marketing networks. This will be dependent to a large extent on how well the distributors perform their roles in the future.

14.3 PRICING AND MARGINS

As reported in Section 7, the current marketing system is operating on low margins and rapid turnover. There are insufficient incentives to encourage and allow inventory holding to meet peak demand periods. As a result, on occasion farmers have had to pay up to LE 4.00/50-kg bag more to obtain supplies in peak demand seasons. Seasonal pricing systems, as recommended in Sections 6 and 7, will not increase the average weighted retail prices of fertilizers as much as the increases associated with spot shortages. To achieve peak season supply availability for all farmers, there must be a slight overall increase in prices.

The current low margin situation is also curtailing the development of full dealer services to farmers and market development programs by dealers. It can be expected that, over time, some dealers will develop these services and programs. As a result, the added value provided by such services will increase the retail prices of fertilizers sold by these dealers. This will lead to a diverse choice for farmers; they will be able to patronize either minimum price, minimum service dealers or, alternatively, higher price, added value service dealers. At this stage the marketing system will be fully developed. To achieve this situation, however, there is a need for dealer training and development programs.

14.4 DEALER TRAINING AND DEVELOPMENT

Sponsored by USAID/Cairo the IFDC has developed a dealer training program in conjunction with the PBDAC. This program is designed to train the emerging dealers in product knowledge, product use, business management, and marketing, to better enable them to compete in an open competitive market. In addition to fertilizer technology and marketing, the training modules include seed technology and marketing, and pesticide technology, safety, and marketing. This is designed to encourage the development of multi-input dealers to serve the farm community. There is still a reluctance of the agri-input manufacturers and distributors to fully support this effort. Dealers may consider forming a trade association, not only to represent them in negotiations with production companies and the government, but also to assume future responsibility for the continual training of dealers.

14.5 PBDAC PARTICIPATION IN FERTILIZER DISTRIBUTION

The privatization of fertilizer marketing in Egypt is in a transitional phase, and some concerns have been expressed by the PBDAC on the ability and willingness of the private sector to fully serve the interests of all farmers. These concerns are quite valid, in view of the occurrence of spot shortages in peak demand periods during the past year, and the subsequent short-term price rises. However, the development of the private sector distribution network since June 1992, and the adoption of the recommendations made concerning ex-factory pricing and imports will correct this situation.

For all intents and purposes, the PBDAC is no longer a participant in fertilizer distribution. A future role for the PBDAC in fertilizer distribution during the developmental and stabilization period of the next 2 or 3 years cannot be justified. Re-entry of the PBDAC into fertilizer distribution would be counter productive to the GOE's economic reform program. It is therefore recommended that the PBDAC should disengage from all fertilizer distribution activities by the end of 1993, and should not enter into any new factory contracts for fertilizer liftings in 1993/94.

Also, the PBDAC should take steps to recondition all distressed fertilizer products held in stock and rebag where necessary and feasible. These stocks should then be sold at market clearing prices before the end of 1993. The continued presence of these stocks tends to act as a deterrent to the future development of the private sector because of the uncertainty created as to the PBDAC's future intentions.

14.5.1 PBDAC Fertilizer Imports

The PBDAC is still responsible for the importation, distribution, and sale of subsidized potassium sulfate and, currently, has international tenders for 279,000 mt of ammonium sulfate for delivery in 1993. The stocks of potassium sulfate, as of December 31, 1992, were 36,429 mt, which would be sufficient at current demand levels for almost 1 full year.

It is recommended that the PBDAC should make current stocks of potassium sulfate available to the private sector retailers or cooperatives at the current subsidized retail price of LE 380.00/mt less LE 5.00/mt discount. Direct sales by PBDAC to farmers should continue at the subsidized retail price to ensure that the private sector does not erode the subsidy..

In line with the import and subsidy removal recommendations for potassium sulfate, the PBDAC should confer with the major private sector distributors and cooperatives concerning the future importations of subsidized potassium sulfate and unsubsidized potassium chloride by the private sector to ensure that supplies are available to meet demand for these products by November 1993.

The PBDAC should review the proposed level of importation of ammonium sulfate with the major private sector distributors and cooperatives. At the current price levels, demand for ammonium sulfate is approximately half that of past demand levels. The PBDAC should sell all imports of ammonium sulfate directly to the private sector, the EAO, and cooperatives.

14.5.2 Management Information System

The disengagement of the PBDAC from fertilizer distribution has led to a situation in which coordinated, timely information on fertilizer production, imports, stocks, prices, and use is no longer available. The removal of most of the production companies from the one holding company, (CIC), and the announcement of the pending privatization of the Abu Qir Fertilizer Company, cast doubt on the continued coordination of production data. The PBDAC has a legitimate need for information in relation to its banking activities in the fertilizer and farm sectors. The development of a Management Information System for the fertilizer sector is a need that should be addressed with some urgency.

It is recommended that the Ministry of Industry should ensure that it continues to collect, collate, and publish fertilizer production and stock situation reports on a timely (monthly) basis.

In addition, all importers and exporters of fertilizer should be required to provide details of quantities imported/exported by product to the Ministry of Industry, either directly or in collaboration with the Ministry of Trade. This will provide the Ministry of Industry with a complete picture of the fertilizer supply situation.

All production factories should be required to supply the Ministry of Industry with monthly domestic delivery liftings and the PBDAC should intensify its efforts to collect fertilizer retail price information at the governorate and district levels. A systematic sampling system should be employed. During peak demand seasons, price information should be available on at least a weekly basis to enable the identification of possible spot shortages.

The MALR should continue to collect and regularly publish survey information on the use of fertilizers at the crop level and take the leading role in the development of an MIS for the fertilizer sector.

14.5.3 Market Interventions

Implementation of the recommendations regarding ex-factory pricing, imports, and exports plus the coordination of the production companies should ensure that sufficient fertilizer supplies are available within the country at all times. During the current transition period, there may be a need for import intervention to ensure the adequacy of total or individual product supplies, and to overcome spot shortages in the market. The question arises under what circumstances, if any, should the PBDAC make intervention.

It is recommended that the first recourse for aggregate supply intervention by the PBDAC should be to inform the private sector on behalf of the MALR, of its concerns regarding fertilizer supplies and to identify opportunities for importing by the private sector.

Under circumstances in which the private sector declines to import, the PBDAC should then consider limited imports on its own behalf for sale to the private sector and cooperatives. Unless commitments to purchase are made by either the private sector or the cooperatives, however, the PBDAC should not import as it will then be faced with a costs of storage and the necessity of re-entry into fertilizer distribution.

Intervention with regard to spot shortages during peak demand periods should be limited to publicly advertising the facts to attract the private sector to the sales opportunities in the affected locations.

15. ISSUES AND RECOMMENDATIONS

15. INTRODUCTION

The rapid development of the privatization of agricultural inputs distribution in Egypt, as an integral part of the national economic reform program aimed at creating an open, competitive marketing system responsive to the needs of the nation's farmers and market forces, is a continuing process. In spite of the considerable progress made in fertilizer and pesticide distribution privatization since 1990, this marketing system is still in a transition phase. Deficiencies in the system are still apparent and the changes have had both positive and negative effects on the major parties involved in agricultural inputs marketing. The following recommendations are based on an analysis of the impact of the policy reforms on the major parties involved. As such, the recommendations, presented here as a series of issues, are aimed at improving the efficiency of the marketing system through further policy reform.

15.1 DOMESTIC PRODUCTION

Issue: Production Cost Transfers–The role of public sector fertilizer production companies is to provide the least cost product to the domestic market by operating at full capacity. There should be no transfer from the industrial sector to the agricultural sector of excess costs caused by past or present industrial policies.

In an open, competitive market, products of different quality can be sold at the same time, but lower quality products have lower demand and are sold at market clearing prices which may not cover the full cost of production. When market clearing prices are above variable production costs (i.e., costs of production excluding fixed or sunk costs), these production units should continue to operate at full capacity to earn the highest possible rate of return. Efforts to price such products at higher than market clearing prices will not be successful and will result in unnecessary inventory accumulation. If, under such a policy, operating costs cannot be recovered with market clearing prices, it is no longer economical to continue production.

Recommendations:

1. All domestic nitrogen production units should operate at full capacity and should continue to operate so long as unit operating costs are below market clearing unit prices.

2. As the current excess capacity in domestic phosphate production units is a result of full cost pricing above market clearing prices, full capacity utilization can only be achieved at market clearing price levels which are below the current levels. If market clearing product prices fall below potential export realizations, then the excess production may be exported. At lower prices there may be some international demand for these products.

3. Future investments in fertilizer production units related to domestic market demand should be related to improved efficiency in operating costs, such as energy efficiency improvements, or related to changing product specifications that more closely match the preferences of Egyptian farmers.

15.2 EX-FACTORY PRICING

Issue 1: Border Equivalent Pricing–As public sector entities, the fertilizer production companies, while having greater autonomy to make managerial decisions and responsibility for profits, should set ex-factory prices based on border equivalent pricing. Cost plus pricing systems which ignore international prices can penalize the farm sector by transferring the inefficiency costs of the industry to the agricultural sector. The removal of the fertilizer subsidies was not intended to create this effect.

Recommendations:

1. Maximum urea and ammonium nitrate ex-factory prices should be based on border price equivalents derived from export realizations from the Abu Qir and El Nasr companies, adjusted for additional costs of exporting (additional bag costs, transport to port, loading charges) and adjustment for quality differences. Unit export realizations must be higher than (or at least equal to) the domestic market prices. Any significant departure in these companies'

export realizations from recognized international price levels should also be taken into account in estimating border equivalent prices.

2. Maximum ammonium sulfate prices should be based on price equivalents derived from import realizations adjusted for additional costs of bagging and handling and for quality differences. No import tariffs should be included in these CIF price-equivalent calculations. However, the actual sales price may need to be adjusted downward to market clearing rates to achieve full capacity operation.

3. Maximum ex-factory prices for single superphosphate and concentrated superphosphate should be based on import CIF prices for bagged granular triple superphosphate from North African and Middle East sources adjusted for nutrient content and quality. A review every 3 or 6 months should be made of the import equivalent prices to smooth short-term fluctuations in international prices. Minimum ex-factory prices should be as low as necessary to clear full capacity production in the domestic and international markets.

Issue 2: Seasonal Discounts – Ex-factory pricing incentives are necessary during periods of slack domestic demand to maintain approximately equal monthly liftings and accumulation of market located stocks. This is necessary because of a lack of bagged product storage at the factories which limit seasonal peak daily dispatches to the capacities of the bagging lines. The approach to overcoming this situation is multifaceted.

Recommendations:

1. To save costs factories should minimize inventory stocks of finished products.

2. Based on the seasonality of demand and production schedules for each product from each factory, seasonal discounts of about 2.5% to 7.5.% should be announced by the production companies to encourage distributors, wholesalers, retailers and farmers to hold stocks. The discounts should be adequate to cover the cost of storage (finance and rent) for periods of 1 to 3 months. The critical periods for additional liftings are September to November, January and March/April. The August-September period is also critical if plant shutdowns are planned for September-October. The cost of

these discounts can be incorporated into the product price during non-discount periods so that the average weighted price is the target border equivalent price or the market clearing price.

3. Production companies and distributors should assess the possibilities for bulk dispatch of product throughout the year with bagging being undertaken by private sector distributors at regional centers.

4. There should be coordination between factories on annual plant shut-downs, supply situation, and export intentions to ensure sufficient availability of supplies to the domestic market. This should continue to be coordinated within the ministries of Industry and Agriculture on a regular (monthly) basis.

Issue 3: Limited Distributor Competition – A limited number of distributors and market channels for the distribution of fertilizer is not conducive to providing adequate coverage and competition in the market place and could lead to market domination by individual private sector distributors.

Recommendations:

1. Each production company should restrict maximum sales to individual distributors or wholesalers to no more than 15% of the total contract tonnage or 75,000 mt annually, whichever is less, for the next 2 years and impose minimum monthly liftings at no less than 5% of total monthly product supply. These restrictions may be lifted as the participants in factory liftings increase to a sufficiently large number to assure competition in the market. A suggested target number of private sector distributors per factory is between 8-15. An exception to these restrictions should apply to ammonium sulfate from Helwan due to the small annual production.

2. Each production company should maintain a small reserve (between 5% and 10%) of product availability for smaller distributor/wholesalers for the next 2 years. Minimum liftings for this group should be no less than 1% of total monthly supply.

3. Potential distributors, having cash and satisfying the minimum lifting requirements, should be given access to lifting contracts. Over subscription by

distributors for available supplies should be dealt with in a fair and equitable manner.

4. All factories should adhere to the principle of first come first served when dealing with distributors lifting from factories on a daily basis.

5. Information about the number and size of annual liftings for each product should be freely available and published.

Issue 4: Equality in Ex-Factory Pricing – There are disparities in tax treatment of various categories of fertilizer buyers from factories (private sector, cooperatives, Egyptian Agricultural Organization, etc.). There have also been differential discount rates for different parties based on lifting volumes. Such differential treatment of customers is not conducive to fair competition in the market. For the development of a competitive marketing system such practices should be strongly discouraged.

Recommendations:

1. All distributors should pay the same ex-factory price and schedule of taxes: 2% commercial tax and 5% general sales tax. No special exemptions or discounts should be made for any buyers, private or public.

2. Performance discounts related to lifting performance against agreed lifting plans could be introduced and applied equally to all distributors irrespective of monthly lifting quantities. No penalties other than some loss of lifting performance discounts should be incorporated into the terms and conditions for lifting.

3. Volume discounts should not be used by the public sector factories.

Issue 5: Freedom of Product Choice – All distributors should be allowed free selection of products from any production company. That is, there should be no linked sales. Companies must use price differences between different products to sell all of their production.

Recommendation:

All distributors should be free to place orders for any fertilizer quantity within the minimum and maximum lifting restrictions.

Issue 6: Non-Contractual Lifting Plans–The use of fixed tonnage lifting contracts has been attractive to the production companies. While these contracts are designed to enable equal monthly dispatches from the factories, they have hindered the development of seasonal storage and the total number of distributors. The factories need to place more emphasis on domestic pricing or a situation will arise where certain distributors will be able to dictate market requirements.

Recommendations:

1. The system of lifting contracts should be replaced within 1 year by non-contractual lifting plans, restricted only by the minimum (and maximum for 2 years) lifting volumes and cash sales.

2. Production companies should expand their activities to include monitoring of prices and supplies in the market to better assess the market needs.

Issue 7: Credit Terms–Public sector factories have no economic reason to supply credit to the distributors. That responsibility should rest with the PBDAC or commercial banks.

Recommendation:

All ex-factory fertilizer sales should be made only for cash.

15.3 IMPORT REGULATIONS AND TARIFFS

Issue 1: Tariff Protection–The imposition of a 30% import tariff on nitrogen and phosphate fertilizers and, at the same time, allowing private sector imports of fertilizers is a contradictory policy that is intended to temporarily protect the domestic industry. Such protection has, in the past, imposed a heavy indirect tax on agriculture. At present, product quality improvements in Egypt, and improved production efficiencies are sufficient for the domestic industry to compete with any nitrogenous fertilizer imports. The main nitrogen products are already being competitively priced in relation to border equivalent prices. Due to low quality, the domestic phosphate industry is less competitive. On a sunk cost basis, it can compete with better international phosphate products by sufficiently lowering the prices of its own products to ensure market demand. Such a policy will encourage a better and lower cost product mix for phosphate fertilizers and induce the production of more efficient, superior products in the future.

Recommendations:

1. The 30% import tariff on all fertilizers should be removed.

2. Domestic companies, unable to compete profitably on a full cost basis at border equivalent prices, should continue production on a sunk cost basis, selling at market clearing prices.

3. Product registration of all imported fertilizers should be freely available except for strategic reasons, as is the case with potassium nitrate.

Issue 2: Potash Supply, Subsidy and Use–The underutilization of potash fertilizer and the continued subsidy on imported potassium sulfate requires urgent attention because the removal of the existing subsidy will further reduce the use of potassium sulfate. Restrictions on the importation of potassium chloride are unnecessary and should be lifted to allow farmers access to substantially lower cost supplies of potassium fertilizer.

Recommendations:

1. The subsidy on potassium sulfate should be progressively removed over the next 3 years, in conjunction with removal of the prohibition on the import and use of potassium chloride. Private sector import and distribution of both potassium chloride and potassium sulfate should be permitted.

2. The 5% import tariff on potassium fertilizers should be removed.

3. The MALR should issue guidelines for farmers and private sector dealers on the use of potassium chloride for most crops and the recommended continued use of potassium sulfate on specific crops.

4. Egyptian agricultural research centers should investigate the areas and conditions under which the use of potassium chloride may be detrimental to soil productivity.

5. A workshop involving the international potash industry could be convened to review the use of potash and its impact on soil salinity in Egypt.

6. Within 3 years, the MALR should review the situation regarding the use of potassium chloride and make recommendations to farmers on where and when it should be used on a long-term basis.

15.4 EXPORT STRATEGIES

Issue 1:Conditions for Export Availability–The total supply of phosphate fertilizer in Egypt now exceeds the aggregate domestic demand at current prices. This will also be the situation for nitrogen fertilizers after the commissioning of the Suez ammonium nitrate plant in 1994, provided CN and AS prices are set at market clearing levels. After domestically pricing products on the basis recommended, if the domestic market does not lift the entire factory production, then exports should take place.

Recommendations:

1. The public sector production companies should continue to have freedom to export but before being granted export licenses must satisfy the ministries of Industry and Agriculture that domestic supplies of all products are sufficient to meet demand and provide assurances that the export prices they receive are higher than, or equal to, the prices they charge in the domestic market.

2. The timing of any export sales should be matched to periods of low domestic demand and not necessarily to periods of high international demand.

15.5 FREIGHT EQUALIZATION

Issue 1: Pan-Territorial Pricing–The current practice of production companies to sell fertilizer on a delivered price basis allows them to administer a freight equalization system and pan-territorial pricing. This may allow an element of hidden profit at the expense of the agriculture sector and it creates a situation where farmers in Lower Egypt are subsidizing the cost of transport to farmers in Upper Egypt. Also, the full transport cost efficiencies of high analysis fertilizers (compared to low analysis) are unrealized, leading to some resource misallocation and possible uneconomic patterns of regional crop production.

Recommendation:

The principle of applying actual freight costs should be adopted in order to be consistent with free market forces and avoid penalizing farmers in Lower Egypt.

Issue 2: Competitive Transport–The use of transport unions to administer the allocation of sub-contracts to freight companies or to individual truck operators, does not promote efficiency through competition in the transport of fertilizer.

Recommendation:

Within a period of 4 years, the responsibility for arranging fertilizer transport should be passed on directly to the private sector distributors so that they can use their entrepreneurial abilities to reduce their transport costs and farm level prices.

15.6 FERTILIZER LICENSES

Issue 1: Barriers to Market Entry–The restrictive nature and cumbersome administration of the current requirements for fertilizer licensing act as a barrier to legitimate entry into the fertilizer business, particularly at the small retailer level. This is not conducive to developing an open competitive system. The license requirements combine aspects of business registration, building codes, and technical qualifications of personnel. As this combination is very difficult for small retailers, there are an estimated 5-10 unlicensed dealers to every licensed one. This is perpetuating a degree of illegality in fertilizer trading that is not desirable.

Recommendations:

1. The requirements for obtaining a license to deal in fertilizer should be limited to business registration and conditions for storage registration. In addition, there should be a separation of business registration and storage registration.

2. Fertilizer licensing should be limited to distributors, wholesalers, and those engaging in both wholesaling and retailing.

3. Fertilizer retailers selling only to farmers, and handling less than 400 mt of fertilizer per year, should not be required to obtain a dealers license, but should have a business registration for tax purposes.

4. The licensing of storage areas for fertilizer should be separate from the fertilizer business license and limited to storages with a capacity of more than 10 mt.

5. The minimum storage building/storage space specifications and other conditions for fertilizer should be reviewed and revised by the Ministry of Housing and Construction to separate conditions for enclosed warehouses and open storage areas.

6. Qualifying warehouses and open storage areas should then be registered and be available for use by any licensed or unlicensed fertilizer business for the storage of fertilizer.

7. The current requirement for the executing manager of a licensed fertilizer business to be a member of the Agricultural Engineers Union is unnecessary and should be deleted from the fertilizer licensing conditions.

8. Fertilizer business licenses and fertilizer storage licenses should be approved at the Governorate level and only registered at the national level.

9. The three MALR license committees should be combined.

15.7 PESTICIDE LICENSES

Issue: Barriers to Market Entry and Safety—Policy changes which now allow licensed private sector pesticide dealers to apply pesticides for farmers require that changes should be made in the licensing requirements for pesticide dealers, separating the requirements for dealers from those of applicators.

Recommendations:

1. A pesticide license should be required for all businesses selling pesticides.

2. A pesticide sales license should not require the executing manager to be a member of the Agricultural Engineers Union, but should require that the executing manager be able to read and understand the specifications, recommendations, and safety instructions on pesticide labels.

3. As with the fertilizer license recommendations, there should also be a separation of the sales license from the registration of storage areas for pesticides. The current conditions for the safe storage of pesticides should be strictly enforced and consideration given to ensuring that any storage area for pesticides be capable of being secured and locked.

4. A separate pesticide operator's license should be required for the registration of pesticide applicators. Membership of the Agricultural Engineers Union should be a requirement of this license.

5. Consideration should be given to the development of technical and safety training programs for pesticide applicators by the MALR. Completion of this training should be incorporated into the licensing requirements for applicators.

15.8 FERTILIZER STORAGE SAFETY

Issue: Safe Handling and Storage of Ammonium Nitrate--Fertilizer storage safety requirements were easily administered when PBDAC had full control and ownership of all fertilizer products. Under the policy changes already enacted, ownership of fertilizer changes several times in the distribution system. In addition, the increased supply of ammonium nitrate is a significant change. With the exception of ammonium nitrate, which is an oxidizing agent, and anhydrous ammonia (which is limited to the production sites), all fertilizers transported and stored in Egypt present no potential hazards to the community. Ammonium nitrate transporters and storers should be aware of the safety precautions for the transport and storage of this product. Contamination of ammonium nitrate with organic matter or fuel oils represents significant potential dangers in addition to general fire hazards. While this may not be a problem with ammonium nitrate secured in bags, spillages represent a potential source of contamination. This situation should be addressed by the regulatory authorities.

Recommendations:

1. The ammonium nitrate production companies should collaborate in producing and distributing standardized safety precautions for the transport and storage of ammonium nitrate.

2. Registered fertilizer storage areas should be required to display the safety regulations for the storage of ammonium nitrate.

15.9 FERTILIZER QUALITY ASSURANCE

Issue: Customer Assurance–The distribution of fertilizer by the private sector, with changes in product title (ownership), removes full responsibility for product quality and weights from the production companies and the PBDAC. Although a system of quality control will not assure that quality products of a specific weight will always be delivered to farmers, a quality control system can assure farmers of a line of recourse or action for the prosecution of malpractices. It should be noted, that in an open, competitive marketing system, obvious malpractice by private sector dealers is self defeating because farmers are free to purchase from any supplier.

Recommendations:

1. The MALR should prepare comprehensive fertilizer registration and quality control legislation covering guaranteed analysis, weights and measures, bag labeling requirements, authority to enter premises to take samples and check weights, defined malpractices (such as adulteration or underweight bags), and

authority to prosecute offenders. In addition, the legislation should cover the level and extent of fines, license revocation, and compensation to customers for malpractices. This legislation should be applicable to all parties in the fertilizer sector from the production companies to retailers.

2. To enforce the recommended legislation, the MALR needs to maintain quality control laboratories capable of analyzing fertilizers and other agricultural inputs in a timely manner, and train field inspectors in sampling techniques.

15.10 FUTURE ROLE OF THE PBDAC IN THE FERTILIZER SECTOR

Issue 1: PBDAC Participation in Fertilizer Distribution – The privatization of fertilizer marketing in Egypt is in a transitional phase and some concerns have been expressed by PBDAC on the ability and willingness of the private sector to fully serve the interests of all farmers. These concerns are quite valid in view of the occurrence of spot shortages in peak demand periods during the past year and subsequent short-term price rises. However, the development of the private sector distribution network since June 1992, and the recommendations made concerning ex-factory pricing and imports will correct this situation.

For all intents and purposes, the PBDAC is no longer a participant in fertilizer distribution. A future role for the PBDAC in fertilizer distribution during the developmental and stabilization period of the next 2 or 3 years cannot be justified. Re-entry of the PBDAC into fertilizer distribution would be counter productive to the GOE's economic reform program.

Recommendations:

1. The PBDAC should disengage from all fertilizer distribution activities by the end of 1993 and should not enter into any new factory contracts for fertilizer liftings in 1993/94.

2. The PBDAC should take steps to recondition all distressed fertilizer products held in stock and rebag where necessary and feasible. These stocks should then be sold at market clearing prices before the end of 1993.

Issue 2: PBDAC Fertilizer Imports–The PBDAC is still responsible for the importation, distribution, and sale of subsidized potassium sulfate and currently has international tenders for 279,000 mt of ammonium sulfate for delivery in 1993. Stocks of potassium sulfate December 31, 1992, were 36,429 mt, sufficient at current demand levels for almost 1 year's demand.

Recommendations:

1. The PBDAC should make all of its current stocks of potassium sulfate available to the private sector retailers or cooperatives at the current subsidized retail price of LE 380.00/mt less LE 5.00/mt discount. Direct sales by PBDAC to farmers should continue at the subsidized retail price.

2. In line with the import and subsidy removal recommendations for potassium sulfate, the PBDAC should confer with the major private sector distributors and cooperatives concerning the future importations of unsubsidized potassium sulfate and potassium chloride by the private sector to ensure that supplies are available to meet demand for these products by November 1993.

3. The PBDAC should review the proposed level of importation of ammonium sulfate with the major private sector distributors and cooperatives. At the current price levels, demand for ammonium sulfate is approximately half that of past demand levels. The PBDAC should sell all imports of ammonium sulfate directly to the private sector, the EAO and cooperatives.

Issue 3: Redundant Staff–The disengagement of the PBDAC from inputs distribution has created a surplus of personnel formerly engaged in input distribution activities. The current activities or proposals of the PBDAC to address this situation include voluntary early retirement, attrition, retraining, and the leasing of mandoubiahs to mandoubs to operate as private sector inputs dealers.

Recommendations:

1. The voluntary early retirement, training, and attrition programs should be continued to progressively reduce the number of bank employees.

2. The mandoubiah leasing proposals should be implemented in a voluntary, selective, and systematic manner paying due regard to the capabilities of the mandoub volunteers, the business prospects in the selected areas, and under conditions of business training support for a defined period. No special terms and conditions should be imposed that would leave the selected mandoubs at either an advantage or disadvantage compared to the private sector.

3. It is the opinion of the study team that many, if not most, of the mandoubs will not be able to compete successfully in the private sector. The PBDAC is cautioned to proceed carefully with these proposals although time is of the essence. If this program is to be successful, those mandoubs participating should be in operation by the start of the next winter crop season at the latest.

Issue 4: Redundant Storage Assets–Disengagement from fertilizer and other inputs distribution has left the PBDAC with under-utilized storage warehouses, shounas and mandoubiahs. This particular issue is being addressed by a special study and, pending the outcome of the study, only recommendations of principle are made here.

Recommendations:

1. The leasing rates for PBDAC storages to any party should be based on market rates, not the PBDAC computed costs. Any income derived from storage rental or lease agreements will be better than no income.

2. Pending the recommendations of the storage study, the current hold placed on further storage investments in either renovations or new facilities should be maintained.

Issue 5: Replacing Input Distribution Income–The loss of input distribution income by the PBDAC, which in the recent past had accounted for approximately 40% of the organization's income, will need to continue to be addressed through a combination of cost reduction, new deposit generation, increased loan activity, and sale, or income generating utilization of unneeded storage assets. Opportunities exist for increased use of loans to the private sector fertilizer distributors, dealers and potential importers. Restrictions placed on the PBDAC by the Central Bank in relation to bank guarantees are constraining these opportunities and, at the same time, limiting the private sector's access to credit for fertilizer marketing.

Recommendations:

1. Relaxation of the Central Bank requirement for the PBDAC to have deposits equivalent to 100% of bank guarantees for fertilizer distributors to commercial levels will facilitate the further development of private sector distributors lifting from factories and enhance competition.

2. PBDAC should increase loans based on fertilizer as collateral to 80% or 85% of the collateral value in line with commercial banks.

3. PBDAC should review the access conditions of dealers to collateral stocks of fertilizer and provide conditions which do not impose limitations on access by dealers.

4. PBDAC should produce and circulate to dealers a pamphlet detailing all relevant financial services available, conditions and fees for fertilizer dealers.

Issue 6: Credit Services–Crop production credit requirements of farmers have been reduced since 1990/91. As a result there has been a reduction in the PBDAC income from crop production loans.

Recommendations:

1. The PBDAC should develop a more flexible and accessible crop production credit policy based more on the capability of farmers to repay loans, and guided by the aggregate costs of crop production rather than by the continued use of detailed standards for each crop.

2. The PBDAC should continue to develop credit services for post-harvest crop storage, linked where possible to the utilization of its storage facilities.

(This recommendation is not advocating a direct involvement by the PBDAC in the purchase and sale of crop production but in the development of private sector enterprises for grading, storing, and marketing of crops to enable farmers to avoid low market prices at harvest time. The potential credit requirements of private sector enterprises for these services are much larger than either crop production credit or farm input distribution credit.)

Issue 7: Management Information System–The disengagement of the PBDAC from fertilizer distribution has led to a situation in which coordinated, timely information on fertilizer production, imports, stocks, prices, and use is no longer available. The breakup of the production companies from the one holding company, (CIC), and the announcement of the pending privatization of the Abu Qir Fertilizer Company cast doubt on the continued coordination of production data. The PBDAC has a legitimate need for information in relation to its banking activities in the fertilizer and farm sectors. The development of a Management Information System for the fertilizer sector is a need that should be addressed with some urgency.

Recommendations:

1. The Ministry of Industry should ensure that it continues to collect, collate, and publish fertilizer production and stock situation reports on a timely (monthly) basis.

2. All importers and exporters of fertilizer should be required to provide details of quantities imported/exported by product to the Ministry of Industry either directly or in collaboration with the Ministry of Trade. This will provide the Ministry of Industry with a complete picture of the fertilizer supply situation.

3. All production factories should be required to supply the Ministry of Industry with monthly domestic delivery liftings.

4. The PBDAC should intensify its efforts to collect fertilizer retail price information at the governorate and district levels. A systematic sampling system should be employed. During peak demand seasons, price information should be available on at least a weekly basis to enable the identification of possible spot shortages.

5. The MALR should continue to collect and regularly publish survey information on farm use of fertilizers at the crop level.

6. The MALR should be responsible for the coordination, collation and analysis of all fertilizer sector data including production, distribution, use and price.

Issue 8: Market Interventions–Implementation of the recommendations regarding ex-factory pricing, imports, and exports plus coordination of production companies should ensure that sufficient fertilizer supplies are available within the country at all times. During the current transition period, there may be a need for import intervention to ensure the adequacy of total or individual product supplies and to overcome distribution spot shortages in the market. The question arises under what circumstances, if any, should the PBDAC take intervention actions.

Recommendations:

1. The first recourse for aggregate supply intervention by the PBDAC should be to inform the private sector of its concerns regarding fertilizer supplies on behalf of the MALR, and to highlight the opportunities for importing by the private sector.

2. Under circumstances in which the private sector declines to import, the PBDAC should then consider limited imports on its own behalf for sale to the private sector and cooperatives. Unless commitments to purchase are made by either the private sector or the cooperatives, however, the PBDAC should not import as it will then be faced with a costly stockholding or the necessity re-entry into the fertilizer market.

3. Intervention with regard to distribution spot shortages during peak demand periods should be limited to publicly advertising the facts to attract the private sector to the sales opportunities in the affected locations.

15.11 THE FUTURE ROLE OF COOPERATIVES IN FERTILIZER MARKETING

Issue 1: The Need for Decisive Action–The Agrarian Reform Cooperatives and the Multi-Purpose Cooperatives have played an important role in the past in ensuring farmers' access to fertilizer. Their continued role in fertilizer distribution and retailing provides an important alternate market channel to the private sector. The impact of the fertilizer sector policy reforms on the cooperatives has been to diminish their role and the service provided to members. Decisive actions are urgently needed to ensure that the cooperatives can continue to provide a significant role in fertilizer distribution and marketing to the benefit of their members.

Recommendations:

1. GOE and cooperative leaders should confer and decide whether the potential benefits of a strong cooperative sector merit a renewed effort to improve the business operations and management of local cooperatives.

   If the decision is positive, a step-by-step process should be initiated to remove the legal and organizational constraints to cooperatives and improve the business skills of cooperative personnel.

   If the response is negative, the cooperatives should progressively become dependent on their own resources and compete on equal terms with the private sector.

2. GOE and cooperative officials should confer and make the basic decision necessary on the status of cooperatives. A clear decision should be made on whether to continue the current system of government control and financial support for the cooperatives or give them full political, administrative and financial autonomy.

3. Any decision to give the cooperatives full autonomy and responsibility for their own financing should be followed by the incorporation of the changes into new cooperative legislation and a step-by-step plan to implement the changes.

Issue 2: Fertilizer Distribution–The objective of bulk fertilizer purchases by the cooperatives should be to obtain the necessary supplies at the least cost for their members. There is need to examine the patterns of cooperative fertilizer purchases to determine the most appropriate and least costly means of obtaining and distributing their members' fertilizer requirements.

Recommendations:

1. Cooperative leaders at the national and governorate levels should analyze their procedures for the purchase and distribution of agricultural inputs and adopt

the least costly means of accomplishing these tasks. This analysis should include an examination of the costs of the multilayered cooperative structures themselves.

2. Cooperative leaders should give consideration to the development, over time, of a collaborative system of purchasing and distributing inputs that would take advantage of off-season pricing and lower cost storage.

3. To compete more effectively with private fertilizer traders, cooperatives should consider developing and promoting their own "Co-op" brands of fertilizer and other agricultural products, and providing related advisory and training services to their members.

Issue 3: Protection and Support–Some GOE officials and cooperative leaders are seeking additional advantages for the cooperatives and protection from the competition of private traders. Providing additional public resources or protection to the cooperatives would continue to support their inefficiencies and would impede the progressive development of the private sector.

Recommendation:

Private sector businesses should not be penalized for the inability of the cooperatives to compete on an equal footing in an open market. In turn, cooperatives should not be protected from full free market competition by being provided special discounts and tax advantages.

Issue 4: Non-Productive Assets–Cooperatives should make the best use of their resources and eliminate non-productive assets. Some of the cooperatives continue to hold significant amounts of outdated and deteriorated fertilizer, some dating back several years. This fertilizer represents assets that should be disposed of and written off to remove it from the accounts of the cooperative.

Recommendations:

1. Old fertilizer stocks should be disposed of at market clearing prices and any losses written off to eliminate the necessity of carrying it as inventory and to clear the accounts.

2. Larger amounts of old fertilizer should be reconditioned and rebagged to make it marketable and the price lowered to a market clearing level so that the entire stock can be sold.

15.12 FUTURE PRIVATIZATION OF PRODUCTION COMPANIES

The future privatization of the fertilizer production companies in Egypt forms part of the GOE's economic reform proposals. The possible need for some of these companies to be operated on a sunk cost basis requires that a careful and detailed study should be conducted of the impact of such operation on the privatization process.

Recommendation

A detailed study should be conducted to examine the alternative approaches to privatization of the fertilizer production companies with the objectives of ascertaining production efficiency investment requirements, opportunities for cost reductions under private sector operation, valuation of the companies for privatization, and means to optimize the GOE's asset sales values.

Table 4.1.1 Egypt: Actual Farm Prices of Selected Agricultural Crops
IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	88.00	199.10	60.00	81.29	47.24	122.86	15.27
1980/81	91.80	234.71	73.31	98.80	58.09	93.79	15.53
1981/82	81.73	240.12	88.42	130.12	59.96	124.86	18.20
1982/83	109.93	251.29	104.40	126.08	65.13	167.64	20.20
1983/84	124.33	277.48	107.80	130.56	74.04	172.79	24.20
1984/85	171.73	318.06	122.42	211.50	96.86	194.36	30.00
A-Average(1980-81)	89.90	216.91	66.66	90.05	52.67	108.33	15.40
B-Average (1980-85)	111.25	253.46	92.73	129.73	66.89	146.05	20.57
1985/86	224.93	458.26	134.20	247.25	97.14	219.00	30.50
1986/87	220.60	549.55	211.10	206.00	114.25	254.64	34.00
1987/88	237.40	553.61	190.00	256.50	143.50	324.29	38.00
1988/89	436.47	577.42	194.40	362.00	201.67	404.64	50.00
1989/90	473.33	690.32	242.00	367.00	262.70	426.79	58.00
1990/91	498.13	875.10	282.00	435.80	316.60	441.00	66.00
C-Average(1990-91)	485.73	782.71	262.00	401.40	289.65	433.90	62.00
D-Average(1986-91)	348.48	617.38	208.95	312.43	189.31	345.06	46.08
%Change (A to C)	440.30	260.85	293.07	345.78	449.99	300.55	302.60
%Change (B to D)	213.23	143.58	125.34	140.84	183.03	136.26	124.07
E-Average (1986-88)	227.64	520.47	178.43	236.58	118.30	265.98	34.17
F-Average (1989-91)	469.31	714.28	239.47	388.27	260.32	424.14	58.00
% Change (E to F)	106.16	37.24	34.21	64.11	120.06	59.47	69.76

Notes: 1 - Berseem In LE Per One Cut feddan
2 - Cotton in kentar (kentar = 157.5 KG)
Source: Derived from MALR Data

FPAC

Table 4.1.2 Egypt: Deflated Farm Prices of Selected Agricultural Crops

IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	88.00	199.10	60.00	81.29	47.24	122.86	15.27
1980/81	80.79	206.55	64.51	86.95	51.12	82.54	13.67
1981/82	56.14	164.92	60.73	89.37	41.18	85.76	12.50
1982/83	68.40	156.36	64.96	78.45	40.53	104.31	12.57
1983/84	70.90	158.23	61.47	74.45	42.22	98.53	13.80
1984/85	87.67	162.37	62.50	107.97	49.45	99.22	15.32
A-Average(1980-81)	84.39	202.83	62.26	84.12	49.18	102.70	14.47
B-Average (1980-85)	75.32	174.59	62.36	86.41	45.29	98.87	13.85
1985/86	93.55	190.58	55.81	102.83	40.40	91.08	12.68
1986/87	80.89	201.52	77.41	75.54	41.90	93.38	12.47
1987/88	71.52	166.79	57.24	77.28	43.23	97.70	11.45
1988/89	107.28	141.92	47.78	88.98	49.57	99.46	12.29
1989/90	99.55	145.19	50.90	77.19	55.25	89.76	12.20
1990/91	89.99	158.09	50.95	78.73	57.20	79.67	11.92
C-Average(1990-91)	94.77	151.64	50.92	77.96	56.22	84.72	12.06
D-average(1986-91)	90.46	167.35	56.68	83.42	47.92	91.84	12.17
%Change (A to C)	12.30	-25.24	-18.21	-7.32	14.32	-17.51	-16.64
%Change (B to D)	20.11	-4.15	-9.11	-3.46	5.82	-7.11	-12.16
E-Average (1986-88)	81.99	186.30	63.49	85.21	41.84	94.05	12.20
F-Average (1989-91)	98.94	148.40	49.87	81.63	54.01	89.63	12.14
% Change (E to F)	20.68	-20.34	-21.44	-4.21	29.07	-4.70	-0.52

Notes :1- Berseem In LE/One Cut Foddan

3- Deflated Prices Are Actual Prices(Table 4.1.1)Divided By CPIR 1980 = 100

Source: Derived from MALR And CAPMS Data

Table 4.1.5 Egypt: **Deflated NPK:Farm Crop Price Ratios of Selected Agricultural Crops**
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	2.16	0.95	3.17	2.34	4.02	1.55	12.44
1980/81	2.81	1.10	3.52	2.61	4.44	2.75	16.62
1981/82	3.66	1.25	3.39	2.30	4.99	2.40	16.45
1982/83	2.61	1.14	2.75	2.28	4.40	1.71	14.20
1983/84	2.23	1.00	2.57	2.12	3.74	1.60	11.45
1984/85	1.52	0.82	2.13	1.23	2.70	1.34	8.70
A-Average(1980-81)	2.49	1.03	3.34	2.47	4.23	2.15	14.53
B-Average (1980-85)	2.50	1.04	2.92	2.15	4.05	1.89	13.31
1985/86	1.17	0.57	1.96	1.06	2.70	1.20	8.61
1986/87	1.26	0.51	1.32	1.35	2.43	1.09	8.18
1987/88	1.41	0.61	1.77	1.31	2.34	1.03	8.83
1988/89	1.13	0.85	2.53	1.36	2.44	1.22	9.86
1989/90	1.10	0.76	2.16	1.42	1.99	1.22	9.00
1990/91	1.50	0.85	2.65	1.71	2.36	1.69	11.32
C-Average(1990-91)	1.30	0.80	2.40	1.57	2.17	1.46	10.16
D-average(1986-91)	1.26	0.69	2.06	1.37	2.38	1.24	9.30
%Change (A to C)	-47.65	-21.64	-28.14	-36.64	-48.66	-32.15	-30.10
%Change (B to D)	-49.49	-33.76	-29.36	-36.22	-41.30	-34.30	-30.15
E-Average (1986-88)	1.28	0.56	1.68	1.24	2.49	1.11	8.54
F-Average (1989-91)	1.24	0.82	2.45	1.50	2.26	1.38	10.06
% Change (E to F)	-2.87	46.15	45.63	20.88	-9.19	24.30	17.76

Source: Derived from MALR And CAPMS Data

Table 4.1.6 Egypt: Deflated N:Farm Crop Price Ratios of Selected Agricultural Crops
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	2.20	0.97	3.23	2.39	4.11	1.58	12.70
1980/81	2.94	1.15	3.68	2.73	4.64	2.87	17.36
1981/82	3.85	1.31	3.55	2.42	5.24	2.52	17.27
1982/83	2.76	1.21	2.91	2.41	4.66	1.81	15.02
1983/84	2.37	1.06	2.73	2.25	3.97	1.70	12.16
1984/85	1.63	0.88	2.29	1.33	2.90	1.44	9.35
A-Average(1980-81)	2.57	1.06	3.46	2.56	4.37	2.23	15.03
B-Average (1980-85)	2.62	1.10	3.07	2.25	4.25	1.99	13.98
1985/86	1.25	0.61	2.10	1.14	2.90	1.29	9.23
1986/87	1.35	0.54	1.41	1.45	2.61	1.17	8.78
1987/88	1.52	0.65	1.89	1.40	2.51	1.11	9.47
1988/89	1.15	0.87	2.59	1.39	2.50	1.24	10.07
1989/90	1.14	0.78	2.22	1.47	2.05	1.26	9.28
1990/91	1.44	0.82	2.54	1.64	2.26	1.62	10.84
C-Average(1990-91)	1.29	0.80	2.38	1.55	2.15	1.44	10.06
D-average(1986-91)	1.31	0.71	2.13	1.41	2.47	1.28	9.61
%Change (A to C)	-49.96	-24.78	-31.12	-39.25	-50.75	-35.27	-33.09
%Change (B to D)	-50.17	-35.02	-30.64	-37.20	-41.91	-35.48	-31.24
E-Average (1986-88)	1.37	0.60	1.80	1.33	2.67	1.19	9.16
F-Average (1989-91)	1.24	0.82	2.45	1.50	2.27	1.38	10.06
% Change (E to F)	-9.55	36.61	35.98	12.74	-15.13	15.70	9.86

Source: Derived from MALR And CAPMS Data

Table 4.1.7 Egypt: Deflated P:Farm Crop Price Ratios of Selected Agricultural Crops
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	2.05	0.90	3.00	2.21	3.81	1.47	11.79
1980/81	2.28	0.89	2.85	2.12	3.60	2.23	13.46
1981/82	2.97	1.01	2.74	1.86	4.04	1.94	13.32
1982/83	2.01	0.88	2.11	1.75	3.39	1.32	10.92
1983/84	1.73	0.78	2.00	1.65	2.91	1.24	8.89
1984/85	1.19	0.64	1.67	0.97	2.12	1.05	6.83
A-Average(1980-81)	2.16	0.90	2.93	2.16	3.70	1.85	12.62
B-Average (1980-85)	2.04	0.85	2.40	1.76	3.31	1.54	10.87
1985/86	0.89	0.44	1.50	0.81	2.07	0.92	6.59
1986/87	0.98	0.39	1.02	1.05	1.88	0.85	6.33
1987/88	1.12	0.48	1.40	1.04	1.86	0.82	7.01
1988/89	1.08	0.81	2.42	1.30	2.33	1.16	9.41
1989/90	1.04	0.71	2.03	1.34	1.87	1.15	8.48
1990/91	1.77	1.01	3.12	2.02	2.78	1.99	13.33
C-Average(1990-91)	1.40	0.86	2.58	1.68	2.33	1.57	10.91
D-average(1986-91)	1.15	0.64	1.92	1.26	2.13	1.15	8.53
%Change (A to C)	-35.10	-4.27	-11.94	-22.42	-37.22	-14.79	-13.61
%Change (B to D)	-43.74	-24.66	-20.07	-28.46	-35.59	-25.48	-21.57
E-Average (1986-88)	1.00	0.44	1.31	0.97	1.94	0.86	6.65
F-Average (1989-91)	1.29	0.84	2.52	1.55	2.33	1.44	10.41
% Change (E to F)	29.75	93.03	93.12	60.78	20.17	66.70	56.57

Source: Derived from MALR And CAPMS Data

Table 4.1.8 Egypt: Deflated K:Farm Crop Price Ratios of Selected Agricultural Crops
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	2.16	0.95	3.17	2.34	4.02	1.55	12.44
1980/81	2.81	1.10	3.52	2.61	4.44	2.75	16.62
1981/82	3.66	1.25	3.39	2.30	4.99	2.40	16.45
1982/83	2.61	1.14	2.75	2.28	4.40	1.71	14.20
1983/84	2.23	1.00	2.57	2.12	3.74	1.60	11.45
1984/85	1.52	0.82	2.13	1.23	2.70	1.34	8.70
A-Average(1980-81)	2.49	1.03	3.34	2.47	4.23	2.15	14.53
B-Average (1980-85)	2.50	1.04	2.92	2.15	4.05	1.89	13.31
1985/86	1.17	0.57	1.96	1.06	2.70	1.20	8.61
1986/87	1.26	0.51	1.32	1.35	2.43	1.09	8.18
1987/88	1.41	0.61	1.77	1.31	2.34	1.03	8.83
1988/89	1.13	0.85	2.53	1.36	2.44	1.22	9.86
1989/90	1.10	0.76	2.16	1.42	1.99	1.22	9.00
1990/91	1.50	0.85	2.65	1.71	2.36	1.69	11.32
C-Average(1990-91)	1.30	0.80	2.40	1.57	2.17	1.46	10.16
D-average(1986-91)	1.26	0.69	2.06	1.37	2.38	1.24	9.30
%Change (A to C)	-47.65	-21.64	-28.14	-36.64	-48.66	-32.15	-30.10
%Change (B to D)	-49.49	-33.76	-29.36	-36.22	-41.30	-34.30	-30.15
E-Average (1986-88)	1.28	0.56	1.68	1.24	2.49	1.11	8.54
F-Average (1989-91)	1.24	0.82	2.45	1.50	2.26	1.38	10.06
% Change (E to F)	-2.87	46.15	45.63	20.88	-9.19	24.30	17.76

Source: Derived from MALR And CAPMS Data

Table 4.2.1 EGYPT : Actual Prices Of Fertilizers

IFDC Fertilizer Policy Impact Study 1993

Year	Urea 46.5%	AN 33.5%	AN 31 %	AS 20.6 %	CN 15.5 %	SSP 15 %	CSP 37 %	TSP 44 %	SOP 48%
1979/80	89 22	63.82	59.10	41.00	35.00	27.30	-	78.00	42.00
1980/81	118.10	85.40	79.10	54 30	45 00	30.30	-	86.80	57.00
1981/82	117 70	84.18	77.91	53 90	43 89	29.23	-	86.80	57.00
1982/83	126.80	91 20	84 50	57 90	47.70	30.30	-	86.80	57.00
1983/84	126 80	91.20	84 50	57.90	47.70	30.30	-	86.80	57.00
1984/85	126.80	91.20	84.50	57 90	47 70	30.30	-	86.80	57.00
A-Average(80-81)	103 66	74.61	69 10	47.65	40.00	28 80	-	82.40	49.50
B-Average(80-85)	117 57	84 50	78 27	53.82	44 50	29.62	-	85.33	54.50
1985/86	131 00	91.20	88.50	57.90	47.70	30 30	-	86.80	57.00
1986/87	131 00	91 20	-	57.90	47.70	30 30	75.00	-	57.00
1987/88	141 00	116.10	-	65 95	65.80	36.00	89.50	-	57.00
1988/89	263 00	141 00	-	127 00	84 00	71.00	188.00	-	57.00
1989/90	266.00	145 00	-	127 00	84.00	71.00	188.00	-	53.00
1990/91	291.00	241.00	-	173.00	132 00	128.50	315.50	-	305.00
C-Average (90-91)	278.50	193.00	-	150.00	108.00	99.75	251.75	-	179.00
D-Average (86-91)	203.83	137.58	-	101.46	76.87	61 18	142.67	-	97.67
% Change (A to C)	168 67	158.68	-	214.80	170.00	246.35	-	-	261.62
%Change (B to D)	73.37	62.82	-	88.53	72.74	106.55	-	-	79.20
E-Average (1986-88)	134.33	99.50	29.50	60.58	53.73	32.20	82.25	28.93	57.00
F-Average (1989-91)	273.33	175.67	0.00	142 33	100.00	90.17	230.50	0.00	138.33
% Change (E to F)	103.47	76.55	-100.00	134.94	86.10	180.02	180.24	-100.00	142.69

Source Derived from PBDAC Data

FRTPR.C

Table 4.2.2 EGYPT: Deflated Prices Of Fertilizers

IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	Urea 46.5%	AN 33.5%	AN 31 %	AS 20.6 %	CN 15.5 %	SSP 15 %	CSP 37 %	TSP 44 %	SOP 48%
1979/80	89.22	63.82	59.10	41.00	35.00	27.30	-	78.00	42.00
1980/81	108.62	78.54	72.75	49.94	41.39	27.87	-	79.83	52.42
1981/82	100.03	71.54	66.21	45.81	37.30	24.84	-	73.77	48.44
1982/83	87.06	62.62	58.02	39.75	32.75	20.80	-	59.60	39.14
1983/84	77.38	55.65	51.56	35.33	29.11	18.49	-	52.97	34.78
1984/85	66.01	47.48	43.99	30.14	24.83	15.77	-	45.19	29.67
A-Average(80-81)	98.92	71.18	65.92	45.47	38.19	27.58	-	78.91	47.21
B-Average(80-85)	88.05	63.27	58.61	40.33	33.40	22.51	-	64.89	41.08
1985/86	54.21	37.74	36.62	23.96	19.74	12.54	-	35.92	23.59
1986/87	51.20	35.64	-	22.63	18.64	11.84	29.31	-	22.28
1987/88	47.18	38.85	-	22.07	22.02	12.05	29.95	-	19.07
1988/89	63.33	33.95	-	30.58	20.23	17.10	45.27	-	13.73
1989/90	57.58	31.39	-	27.49	18.18	15.37	40.70	-	11.47
1990/91	54.02	44.74	-	32.12	24.50	23.86	58.57	-	56.62
C-Average (90-91)	55.80	38.06	-	29.80	21.34	19.61	49.63	-	34.05
D-Average (86-91)	54.59	37.05	-	26.47	20.55	15.46	33.97	-	24.46
% Change (A to C)	-43.59	-46.52	-	-34.45	-44.11	-28.90	-	-	-27.88
%Change (B to D)	-38.01	-41.44	-	-34.35	-38.46	-31.34	-	-	-40.45
E-Average (1986-88)	50.86	37.41	12.21	22.89	20.13	12.14	29.63	11.97	21.65
F-Average (1989-91)	58.31	36.69	0.00	30.06	20.97	18.77	48.18	0.00	27.27
% Change (E to F)	14.65	-1.91	-100.00	31.37	4.17	54.62	62.61	-100.00	26.00

Note: Product Prices Are Deflated By API. 1979/80 = 100

Source: Derived from PBDAC And CAPMS Data

FRTPRIC

Table 4.2.3 EGYPT: Weighted Average Fertilizer Nutrient Prices

IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	N	P2O5	K2O	NPK
1979/80	194	180	88	190
1980/81	258	200	119	247
1981/82	254	196	119	242
1982/83	275	200	119	260
1983/84	275	201	119	259
1984/85	275	201	119	256
A-Average(80-81)	226	190	104	219
B-Average(80-85)	255	196	114	242
1985/86	283	202	119	264
1986/87	280	202	119	261
1987/88	324	240	119	302
1988/89	514	480	119	503
1989/90	523	473	110	507
1990/91	696	856	653	727
C-Average (90-91)	610	667	382	617
D-Average (86-91)	437	410	207	427
% Change (A to C)	169.69	251.05	268.60	182.38
%Change (B to D)	71.13	108.66	81.41	76.34
E-Average (1986-88)	295.67	214.67	119.00	275.67
F-Average (1989-91)	577.67	604.67	294.00	579.00
% Change (E to F)	95.38	181.68	147.06	110.04

Source: Derived from PBDAC Data

FRTPRIC

Table 4.2.4 Egypt: Deflated Weighted Average Fertilizer Nutrient Prices

IFDC Fertilizer Policy Impact Study 1993

Year	N	P2O5	K2O	NPK
1979/80	194.00	180.00	88.00	190.00
1980/81	237.28	183.94	109.44	227.16
1981/82	215.86	166.57	101.13	205.66
1982/83	188.81	137.32	81.70	178.51
1983/84	167.81	122.66	72.62	158.05
1984/85	143.17	104.64	61.95	133.27
A-Average(80-81)	215.64	181.97	98.72	208.58
B-Average(80-85)	191.15	149.19	85.81	182.11
1985/86	117.11	83.59	49.25	109.25
1986/87	109.43	78.95	46.51	102.00
1987/88	108.41	80.30	39.82	101.05
1988/89	123.77	115.59	28.66	121.12
1989/90	113.22	103.48	23.81	109.75
1990/91	129.21	158.91	121.22	134.96
C-Average (90-91)	121.21	131.19	72.52	122.36
D-Average (86-91)	116.86	103.47	51.54	113.02
% Change (A to C)	-43.79	-27.90	-26.54	-41.34
%Change (B to D)	-38.87	-30.64	-39.93	-37.94
E-Average (1986-88)	111.65	80.95	45.19	104.10
F-Average (1989-91)	122.07	125.99	57.90	121.95
% Change (E to F)	9.33	55.64	28.12	17.14

Note: Fertilizer Nutrient Prices Are Deflated By API,1979/80 = 100

Source: Derived from PBDAC And CAPMS Data FRTPRIC

Table 4.3.1 Egypt: Fertilizer Nutrient Consumption, 1979/80 to 1990/91

IFDC Fertilizer Policy Impact Study 1993

MT

Year	N	P2O5	K2O	NPK
1979/1980	484,024	96,822	11,616	592,462
1980/1981	594,339	111,182	8,640	714,161
1981/1982	631,711	132,613	11,426	775,750
1982/1983	660,385	144,118	9,589	814,092
1983/1984	746,326	160,725	17,472	924,523
1984/1985	640,931	164,841	24,243	830,015
A-Average (80-81)	539,182	104,002	10,128	653,312
B-Average (80-85)	626,286	135,050	13,831	775,167
1985/1986	778,663	183,663	24,368	986,694
1986/1987	777,037	185,407	28,887	991,331
1987/1988	791,526	190,886	29,492	1,011,904
1988/1989	790,388	180,290	27,035	997,713
1989/1990	834,297	170,069	21,189	1,025,555
1990/1991	841,177	186,806	27,715	1,055,696
C-Average (90-91)	837,737	178,438	24,452	1,040,627
D-Average (86-91)	802,181	182,854	26,448	1,011,483
% Change (A to C)	55.37	71.57	141.43	59.28
% Change (B to D)	28.09	35.40	91.22	30.49
% Growth Rate	4.26	5.44	11.01	4.59
1991/1992	738,950	124,930	21,042	884,922
Estimate : 1992/1993	943,185	167,417	23,196	1,133,798
Projections: 1992/1993				
Low	909,817	201,389	33,328	1,144,534
Medium	952,475	207,516	38,025	1,198,016
High	964,668	231,622	41,331	1,237,621
E-Average (1986-88)	782,409	186,652	27,582	996,643
F-Average (1989-91)	821,954	179,055	25,313	1,026,322
% Change (E to F)	5.05	-4.07	-8.23	2.98

Source: Derived from PBDAC Data

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Table 4.3.2 Egypt: Fertilizer Nutrient Use Rates

IFDC Fertilizer Policy Impact Study 1993

KG/FD

Year	Cultivated Area				Crop Area			
	N	P2O5	K2O	NPK	N	P2O5	K2O	NPK
1979/80	82.35	16.47	1.98	100.79	44.07	8.82	1.06	53.95
1980/81	101.89	19.06	1.48	122.43	53.60	10.03	0.78	64.40
1981/82	107.98	22.67	1.95	132.61	56.37	11.83	1.02	69.22
1982/83	113.31	24.73	1.65	139.69	58.70	12.81	0.85	72.36
1983/84	124.55	26.82	2.92	154.29	66.70	14.36	1.56	82.62
1984/85	107.13	27.55	4.05	138.73	57.35	14.75	2.17	74.27
A-Average (80-81)	92.12	17.77	1.73	111.61	48.84	9.42	0.92	59.18
B-Average (80-85)	106.20	22.88	2.34	131.42	56.13	12.10	1.24	69.47
1985/86	129.76	30.61	4.06	164.42	69.92	16.49	2.19	88.60
1986/87	130.11	31.05	4.84	166.00	69.83	16.66	2.60	89.09
1987/88	129.72	31.28	4.83	165.83	70.45	16.99	2.63	90.07
1988/89	129.15	29.46	4.42	163.03	69.71	15.90	2.38	87.99
1989/90	132.37	26.98	3.36	162.71	72.33	14.75	1.84	88.97
1990/91	133.71	29.69	4.41	167.81	72.28	16.05	2.38	90.72
C-Average (90-91)	133.04	28.34	3.88	165.26	72.33	15.40	2.11	89.84
D-Average (86-91)	130.80	29.84	4.32	164.97	70.76	16.14	2.34	89.24
% Change (A to C)	44.42	59.50	124.65	48.06	48.11	63.49	129.73	51.83
% Change (B to D)	23.16	30.42	84.80	25.52	26.06	33.40	88.36	28.45
% Growth Rate	3.54	4.71	10.60	3.87	3.88	5.06	10.97	4.21
1991/92	119.19	20.15	3.39	142.73	62.48	10.56	1.78	74.82
Estimate 1992/93	152.12	27.00	3.74	182.87	79.75	14.42	1.96	95.87
Projection 1992/93	143.30	32.55	5.39	181.05	78.00	17.72	2.93	98.52

E-Average (1986-88)	129.86	30.98	4.58	165.42	70.07	16.71	2.47	89.25
F-Average (1989-91)	131.74	28.71	4.06	164.51	71.46	15.57	2.20	89.23
% Change (E to F)	1.45	-7.32	-11.26	-0.55	1.98	-6.86	-10.87	-0.03

Source: Derived from PBDAC Data

Table 4.3.3 EGYPT :Actual Fertilizer Costs In Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	12.18	3.92	3.36	9.64	15.42	12.64	40.70
1980/81	13.80	4.51	4.09	15.97	22.57	17.91	47.83
1981/82	19.50	8.04	4.29	14.71	25.93	21.37	83.39
1982/83	22.01	10.85	4.60	14.57	25.62	25.97	85.85
1983/84	22.52	8.82	4.77	15.51	25.92	26.21	86.60
1984/85	22.40	11.40	5.38	15.11	26.77	30.10	87.17
A-Average (80-81)	12.99	4.22	3.73	12.81	19.00	15.28	44.27
B-Average (80-85)	18.74	7.92	4.42	14.25	23.71	22.37	71.92
1985/86	23.83	12.75	6.00	16.06	24.38	34.79	89.51
1986/87	26.14	11.68	6.30	20.03	24.67	32.86	103.33
1987/88	25.64	13.00	6.99	22.03	28.44	35.44	103.60
1988/89	42.45	20.98	9.75	28.75	41.27	52.37	135.93
1989/90	50.27	23.87	7.75	36.52	56.60	64.70	163.42
1990/91	73.10	38.50	13.20	47.90	71.80	91.70	265.50
C-Average (90-91)	61.69	31.19	10.48	42.21	64.20	78.20	214.46
D-Average (86-91)	40.24	20.13	8.33	28.55	41.19	51.98	143.55
% Change (A to C)	374.87	639.86	181.21	229.64	237.98	411.95	384.49
% Change (B to D)	114.78	154.06	88.71	100.32	73.77	132.38	99.59
E-Average (1986-88)	25.20	12.48	6.43	19.37	25.83	34.36	98.81
F-Average (1989-91)	55.27	27.78	10.23	37.72	56.56	69.59	188.28
% Change (E to F)	119.31	122.68	59.15	94.72	118.96	102.51	90.54

Source: Derived from MALR Data

FPCOST

Table 4.3.4 Egypt:Deflated Fertilizer Costs in Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	12.18	3.92	3.36	9.64	15.42	12.64	40.70
1980/81	12.69	4.15	3.76	14.69	20.76	16.47	43.99
1981/82	16.57	6.83	3.65	12.50	22.04	18.16	70.87
1982/83	15.11	7.45	3.16	10.00	17.59	17.83	58.94
1983/84	13.74	5.38	2.91	9.46	15.82	15.99	52.85
1984/85	11.66	5.93	2.80	7.87	13.94	15.67	45.38
A-Average (80-81)	12.44	4.03	3.56	12.16	18.09	14.56	42.34
B-Average (80-85)	13.66	5.61	3.27	10.69	17.59	16.13	52.12
1985/86	9.86	5.28	2.48	6.65	10.09	14.40	37.04
1986/87	10.22	4.56	2.46	7.83	9.64	12.84	40.38
1987/88	8.58	4.35	2.34	7.37	9.52	11.86	34.66
1988/89	10.22	5.05	2.35	6.92	9.94	12.61	32.73
1989/90	10.88	5.17	1.68	7.91	12.25	14.01	35.38
1990/91	13.57	7.15	2.45	8.89	13.33	17.02	49.29
C-Average (90-91)	12.23	6.16	2.06	8.40	12.79	15.51	42.33
D-Average (86-91)	10.56	5.26	2.29	7.59	10.79	13.79	38.25
% Change (A to C)	-1.68	52.64	-42.03	-30.95	-29.29	6.59	-0.03
% Change (B to D)	-22.73	-6.27	-29.93	-28.98	-38.64	-14.50	-26.62
E-Average (1986-88)	9.55	4.73	2.43	7.28	9.75	13.03	37.36
F-Average (1989-91)	11.56	5.79	2.16	7.91	11.84	14.55	39.13
% Change (E to F)	21.00	22.38	-11.09	8.59	21.45	11.62	4.73

Source: Derived from MALR And CAPMS Data

FPCOST

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Table 4.3.5 EGYPT: Deflated Cost Of Fertilizer Per MT Of Crop Output

IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	Wheat	Broad Beans	Rice	Cotton	Maize	Sugarcane
1980	9.30	4.51	3.93	13.63	7.46	1.19
1981	9.16	4.74	6.28	18.45	9.58	1.25
1982	11.29	7.21	5.25	19.40	10.50	2.06
1983	10.00	8.24	4.13	16.45	9.92	1.75
1984	8.92	6.10	4.17	14.83	8.55	1.49
1985	7.39	6.66	3.15	12.65	8.11	1.23
A-Average (80-81)	9.23	4.63	5.11	16.04	8.52	1.22
B-Average (80-85)	9.34	6.24	4.49	15.90	9.02	1.50
1986	6.17	3.62	2.74	9.51	5.92	1.00
1987	5.16	2.96	3.38	9.63	6.43	1.02
1988	4.30	4.36	2.89	10.94	5.69	0.88
1989	4.93	4.04	2.54	12.32	5.58	0.80
1990	4.99	3.95	2.59	14.53	5.77	0.89
1991	6.71	6.81	2.91	14.99	7.01	1.17
C-Average (90-91)	5.85	5.38	2.75	14.76	6.39	1.03
D-Average (86-91)	5.38	4.29	2.84	11.98	6.07	0.96
% Change (A to C)	-36.67	16.29	-46.17	-8.00	-25.01	-15.85
%Change (B to D)	-42.47	-31.28	-36.64	-24.63	-32.75	-35.74
E-Average (1986-88)	5.21	3.65	3.00	10.03	6.01	0.97
F-Average (1989-91)	5.54	4.93	2.68	13.94	6.12	0.95
% Change (E to F)	6.32	35.28	-10.79	39.04	1.79	-1.62

Note: Costs Deflated By API,1979/80 = 100

Source: Derived from MALR And CAPMS Data

FPCOST

Table 4.3.6 EGYPT: Share Of Fertilizer Costs in Total Variable Costs Of Production Per Feddan

IFDC Fertilizer Policy Impact Study 1993 **Percent**

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	13.10	4.96	5.96	7.47	8.67	12.04	12.57
1980/81	12.89	4.48	6.47	9.78	9.42	12.85	13.56
1981/82	14.94	6.03	5.53	7.16	8.16	12.33	19.21
1982/83	12.06	6.37	5.01	6.32	6.95	12.28	16.97
1983/84	10.59	4.75	2.68	5.38	6.16	10.72	14.49
1984/85	9.00	5.42	2.84	5.58	5.95	10.25	13.98
A-Average (80-81)	12.99	4.72	6.22	8.63	9.04	12.44	13.06
B-Average(80-85)	12.09	5.33	4.75	6.95	7.55	11.75	15.13
1985/86	8.38	5.54	3.03	4.64	5.04	10.78	12.71
1986/87	8.63	4.51	2.88	5.14	4.85	10.06	13.38
1987/88	7.75	4.57	2.79	5.50	5 31	10.24	12.69
1988/89	11.84	6.36	3.50	6.50	7.41	12.48	14.65
1989/90	12.52	5.92	2.15	8.19	8.57	13.84	15.96
1990/91	15.66	7.90	3.23	7.90	9.55	16.62	19.25
C-Average (90-91)	14.09	6.91	2.69	8.04	9.06	15.23	17.60
D-Average (86-91)	10.80	5.80	2.93	6.31	6.79	12.34	14.77
%Change (A to C)	8.42	46.41	-56.70	-6.77	0.19	22.41	34.76
%Change (B to D)	-10.74	8.73	-38.33	-9.16	-10.08	5.04	-2.35
E-Average (1986-88)	8.25	4.87	2.90	5.10	5.07	10.36	12.93
F-Average (1989-91)	13.34	6.73	2.96	7.53	8.51	14.32	16.62
% Change (E to F)	61.63	38.03	2.15	47.76	67.97	38.18	28.57

Source: Derived from MALR Data

SHAR

Table 4.4.1 EGYPT : Fertilizer Product Mix Percent Shares
IFDC Fertilizer Policy Impact Study 1993

Year	Percent % of Total N					Percent % of Total P2O5			
	Urea 46%N	AN 33.5%N	CAN 31%N	CN 15.5%N	AS 20.6%N	SSP 15%P2O5	CSP 37.5%P2	TSP 46%P2O5	SOP 48%K2O
1979/80	39.32	15.33	31.17	7.94	6.24	66.85	0.00	33.15	100.00
1980/81	41.96	19.47	28.76	6.37	3.44	61.64	0.00	38.36	100.00
1981/82	50.28	13.01	26.86	5.80	4.05	54.95	0.00	45.05	100.00
1982/83	56.30	4.20	28.20	6.00	4.80	59.70	0.00	40.30	100.00
1983/84	61.10	3.70	25.50	5.60	3.70	68.50	0.00	31.50	100.00
1984/85	53.00	5.90	28.40	5.40	6.80	78.40	0.00	21.60	100.00
1985/86	53.00	9.80	23.00	4.20	9.70	87.40	6.50	6.10	100.00
1986/87	54.70	6.70	23.30	4.50	10.50	80.10	19.20	0.80	100.00
1987/88	55.80	9.50	20.70	4.80	9.10	79.50	20.20	0.20	100.00
1988/89	48.80	38.00	-	4.50	8.70	79.10	20.90	-	100.00
1989/90	52.40	35.00	-	4.60	8.00	85.40	14.60	-	100.00
1990/91	53.30	32.30	-	4.50	9.80	83.70	16.30	-	100.00
1991/92	46.50	41.20	-	3.90	8.10	89.90	10.10	-	100.00
1992/93	39.60	53.70	-	4.00	2.80	87.10	12.90	-	100.00
E-Average (1986-88)	54.50	8.67	22.33	4.50	9.77	82.33	15.30	2.37	100.00
F-Average (1989-91)	50.25	36.63	0.00	4.38	8.65	84.53	15.48	0.00	100.00
% Change (E to F)	-7.80	322.60	-100.00	-2.78	-11.43	2.66	1.14	-100.00	0.00

Source: CIC Data

FPMIX

Table 4.5.1 Egypt: Actual Costs Of Pesticides
IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Cultivated Area	Crop Area
1979/80	9.36	5.01
1980/81	11.72	6.16
1981/82	13.04	6.81
1982/83	12.18	6.31
1983/84	11.32	6.06
1984/85	11.32	6.06
A-Average (80-81)	10.54	5.59
B-Average (80-85)	11.49	6.07
1985/86	13.87	7.46
1986/87	15.39	8.26
1987/88	17.33	9.41
1988/89	32.56	17.57
1989/90	15.88	8.68
1990/91	20.56	11.12
C-Average (90-91)	18.22	9.90
D-Average (86-91)	19.27	10.42
% Change (A to C)	72.95	77.26
% Change (B to D)	67.71	71.73

Note: MALR Pesticide costs not included.

Source: Derived from MALR Data INSEVAL

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Table 4.5.2 Egypt: Deflated Costs Of Pesticides

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Cultivated Area	Crop Area
1979/80	9.36	5.01
1980/81	10.77	5.67
1981/82	11.08	5.78
1982/83	8.36	4.33
1983/84	6.91	3.70
1984/85	5.89	3.15
A-Average (80-81)	10.07	5.34
B-Average (80-85)	8.73	4.61
1985/86	5.74	3.09
1986/87	6.01	3.23
1987/88	5.80	3.15
1988/89	7.84	4.23
1989/90	3.44	1.88
1990/91	3.82	2.06
C-Average (90-91)	3.63	1.97
D-Average (86-91)	5.44	2.94
% Change (A to C)	-63.96	-63.06
% Change (B to D)	-37.66	-36.17

Note: MALR Pesticide costs not included

Note: Deflation By API, 1979/80 = 100

Source: Derived from MALR Data

INSEVAL

Table 4.5.3 Egypt: Actual Pesticide Costs in Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Rice	Cotton	Maize	Sugarcane
1979/80	-	0.54	-	12.36	1.75	-
1980/81	-	0.61	-	12.16	-	-
1981/82	-	0.86	-	12.12	-	-
1982/83	-	1.72	1.95	12.15	-	-
1983/84	-	1.22	2.95	12.13	0.54	-
1984/85	0.08	1.34	3.63	12.00	4.63	-
A-Average (80-81)	-	0.58	-	12.26	-	-
B-Average (80-85)	-	1.05	-	12.15	-	-
1985/86	1.43	0.97	3.91	12.00	0.19	20.12
1986/87	1.08	1.05	5.11	12.00	0.37	15.45
1987/88	3.27	2.90	4.50	12.00	2.90	1.10
1988/89	1.69	9.89	6.60	13.33	7.50	0.90
1989/90	1.69	5.63	3.87	14.70	0.42	2.16
1990/91	2.30	2.90	11.40	13.30	1.20	-
C-Average (90-91)	2.00	4.27	7.64	14.00	0.81	1.08
D-Average (86-91)	1.91	3.89	5.90	12.89	2.10	6.62
% Change (A to C)	-	641.74	-	14.19	-	-
% Change (B to D)	-	271.07	-	6.05	-	-

Note: MALR Pesticide costs not included.

Source: Derived from MALR Data

fpcost

Table 4.5.4 Egypt: Deflated Pesticide Costs in Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Rice	Cotton	Maize	Sugarcane
1979/80	-	0.54	-	12.36	1.75	-
1980/81	-	0.56	-	11.18	-	-
1981/82	-	0.73	-	10.30	-	-
1982/83	-	1.18	1.34	8.34	-	-
1983/84	-	0.74	1.80	7.40	0.33	-
1984/85	0.04	0.70	1.89	6.25	2.41	-
A-Average (80-81)	-	0.55	-	11.77	-	-
B-Average (80-85)	0.01	0.74	0.84	9.31	0.75	-
1985/86	0.59	0.40	1.62	4.97	0.08	8.33
1986/87	0.42	0.41	2.00	4.69	0.14	6.04
1987/88	1.09	0.97	1.51	4.02	0.97	0.37
1988/89	0.41	2.38	1.59	3.21	1.81	0.22
1989/90	0.37	1.22	0.84	3.18	0.09	0.47
1990/91	0.43	0.54	2.12	2.47	0.22	0.00
C-Average (90-91)	0.40	0.88	1.48	2.83	0.16	0.23
D-Average (86-91)	0.55	0.99	1.61	3.76	0.55	2.57
% Change (A to C)	-	59.59	-	-76.00	-	-
% Change (B to D)	-	32.91	-	-59.64	-	-

Note: MALR Pesticide costs not included.

Note: Costs Deflated By API, 1979/80 = 100

Source: Derived from MALR And CAPMS Data

fpcost

Table 4.5.5 Egypt: Deflated Costs Of Pest Control Per MT Of Crop Output

IFDC Fertilizer Policy Impact Study 1993

LE/MT

Year	Wheat	Broad Beans	Rice	Cotton	Maize	Sugarcane
1979/80	-	0.62	-	10.92	1.03	-
1980/81	-	0.64	-	9.94	-	-
1981/82	-	0.77	-	9.07	-	-
1982/83	-	1.31	0.55	7.80	-	-
1983/84	-	0.84	0.79	6.94	0.18	-
1984/85	0.03	0.78	0.76	5.67	1.25	-
A-Average (80-81)	-	0.63	-	10.43	-	-
B-Average (80-85)	-	0.83	-	8.39	-	-
1985/86	0.37	0.28	0.67	4.68	0.03	0.23
1986/87	0.21	0.27	0.86	4.69	0.07	0.15
1987/88	0.55	0.97	0.59	4.62	0.47	0.01
1988/89	0.20	1.91	0.58	3.98	0.80	0.01
1989/90	0.17	0.93	0.27	3.77	0.04	0.01
1990/91	0.21	0.51	0.69	2.78	0.09	0.00
C-Average (90-91)	0.19	0.72	0.48	3.27	0.06	0.01
D-Average (86-91)	0.28	0.81	0.61	4.08	0.25	0.07
% Change (A to C)	-	14.43	-	-68.61	-	-
% Change (B to D)	-	-2.04	-	-51.32	-	-

Note: MALR Pesticide costs not included.

Note: Costs Deflated By API,1979/80 = 100

Source: Derived from MALR And CAPMS Data

fpcost

Table 4.5.6 Egypt: Share Of Pesticide Costs In Total Variable Costs Per Feddan For Major Crops

IFDC Fertilizer Policy Impact Study 1993

Percent

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	-	0.68	-	-	6.95	1.67	-
1980/81	-	0.61	-	-	5.07	-	-
1981/82	-	0.64	-	-	3.82	-	-
1982/83	-	1.01	-	0.85	3.29	-	-
1983/84	-	0.66	1.22	1.02	2.88	0.22	-
1984/85	0.03	0.64	2.45	1.34	2.67	1.58	-
A-Average (80-81)	-	0.64	-	0.00	6.01	-	-
B-Average(80-85)	-	0.71	-	0.53	4.11	-	-
1985/86	0.50	0.42	0.01	1.13	2.48	0.06	2.86
1986/87	0.36	0.41	0.00	1.31	2.36	0.11	2.00
1987/88	0.99	1.02	1.24	1.12	2.24	0.84	0.13
1988/89	0.47	3.00	1.75	1.49	2.39	1.79	0.10
1989/90	0.42	1.40	-	0.87	2.22	0.09	0.21
1990/91	0.49	0.60	-	1.88	1.77	0.22	0.00
C-Average (90-91)	0.46	1.00	-	1.37	2.00	0.15	0.11
D-Average (86-91)	0.54	1.14	-	1.30	2.24	0.52	0.88
%Change (A to C)	-	54.48	-	-	-66.77	-	-
%Change (B to D)	-	61.30	-	-	-45.42	-	-

Note:MALR Pesticide costs not included.

Source: Derived from MALR Data

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Table 4.6.1 Egypt: Comparative Analysis of Changes in Area, Production and Yields of Major Crops, 1979/80-1990/91

IFDC Fertilizer Policy Impact Study 1993

Percent

Crop	Area Harvested		G.R	Production		G.R	Yield		G.R
	%	%	%	%	%	%	%	%	%
	1980/85 to 1986/91	1980/81 to 1990/91	1980 to 1991	1980/85 to 1986/91	1980/81 to 1990/91	1980 to 1991	1980/85 to 1986/91	1980/81 to 1990/91	1980 to 1991
Wheat	24.72	53.04	3.66	70.72	138.13	8.65	34.81	56.09	4.82
Broad Beans	15.67	32.16	2.83	63.23	80.28	6.60	41.62	35.19	3.66
Rice	0.15	7.26	0.08	12.85	36.83	2.23	12.28	27.59	2.14
Cotton	-9.76	-23.73	-2.07	-25.54	-41.55	-5.07	-17.47	-23.20	-3.60
Maize	-1.75	8.25	0.50	24.63	53.98	4.11	26.87	42.25	3.60
Sugarcane	8.06	7.92	0.98	22.92	27.64	3.03	13.72	18.37	2.02
Tomatoes	19.38	10.51	2.02	51.19	65.20	5.91	27.50	49.56	3.82
Potatoes	10.58	-10.13	0.05	26.50	6.19	2.12	14.26	18.56	2.08

Source: Derived from MALR Data

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Table 4.6.2 Egypt: Percent Shares of Individual Crop Area In Total Area Harvested of All Crops
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane	Tomatoes	Potatoes
1979/80	12.08	2.23	15.68	8.85	11.33	17.35	2.30	3.02	1.52
1980/81	12.62	2.14	15.78	8.62	10.63	17.35	2.26	2.93	1.44
1981/82	12.26	2.45	16.51	9.15	9.51	17.27	2.27	2.87	1.36
1982/83	11.74	2.90	17.07	8.95	8.89	17.35	2.22	2.88	1.22
1983/84	10.53	2.74	17.62	8.80	8.79	17.66	2.18	2.67	1.32
1984/85	10.61	3.03	17.00	8.28	9.67	17.13	2.24	3.09	1.58
1985/86	10.84	2.76	17.64	9.05	9.47	13.32	2.35	3.54	1.56
1986/87	12.35	2.91	17.97	8.84	8.81	16.28	2.41	3.60	1.71
1987/88	12.66	3.23	18.69	7.45	9.03	17.45	2.45	3.58	1.84
1988/89	13.52	3.25	18.52	8.67	8.96	17.68	2.43	3.75	1.55
1989/90	16.96	2.99	16.48	9.00	8.62	17.15	2.43	3.22	1.65
1990/91	19.04	2.51	15.12	8.86	7.34	18.64	2.26	1.24	0.89

Source: Derived from MALR Data

Table 4.6.3 Egypt: Percent Shares of Individual Crop Areas (Average) In Total Area Harvested

IFDC Fertilizer Policy Impact Study 1993

Average	1980/85	1986/91	Difference	1980/81	1990/91	Difference
Wheat	11.64	14.28	2.64	12.35	18.01	5.66
Broad Beans	2.58	2.94	0.36	2.19	2.75	0.57
Berseem	16.61	17.39	0.77	15.73	15.80	0.07
Rice	8.78	8.65	-0.13	8.74	8.93	0.19
Cotton	9.80	8.70	-1.10	10.98	7.98	-3.00
Maize	17.35	16.77	-0.58	17.35	17.90	0.55
Sugarcane	2.25	2.39	0.14	2.28	2.35	0.06
Tomatoes	2.91	3.14	0.24	2.87	2.22	-0.64
Potatoes	1.41	1.53	0.12	1.48	1.27	-0.21

Source: Derived from MALR Data

avararea

Table 4.7.1 Egypt: Total And Per Feddan Loans
IFDC Fertilizer Policy Impact Study 1993

LE

Year	Actual			Deflated		
	Total	Per Feddan		Total	Per Feddan	
		Cultivated	Crop		Cultivated	Crop
1981/82	271,601,380	46.43	24.23	271,601,380	46.43	24.23
1982/83	316,899,909	54.38	28.17	256,023,608	43.93	22.76
1983/84	325,289,332	54.29	29.07	233,575,248	38.98	20.87
1984/85	357,986,805	59.83	32.03	219,298,896	36.65	19.62
1985/86	517,843,510	86.29	46.50	252,162,376	42.02	22.64
1986/87	681,432,122	114.10	61.24	313,376,329	52.47	28.16
1987/88	840,123,252	137.68	74.78	330,778,519	54.21	29.44
1988/89	1,070,023,222	174.84	94.37	303,194,568	49.54	26.74
1989/90	1,259,022,373	199.75	109.22	320,705,642	50.88	27.82
1990/91	1,540,042,732	244.80	132.34	336,414,670	53.48	28.91

Source : PBDAC

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Table 4.7.2 Egypt: Actual And Deflated Fertilizer Loans

IFDC Fertilizer Policy Impact Study 1993 **LE**

Year	Actual			Deflated	
	Fertilizer Loan	Total Value Of Fertilizer	percent	Fertilizer Loan	Total Value Of Fertilizer
1981/82	107,408,800	188,096,621	57.10	107,408,800	188,096,621
1982/83	137,667,932	211,465,600	65.10	111,221,997	170,843,173
1983/84	149,823,688	239,560,581	62.54	107,581,472	172,017,391
1984/85	164,655,776	212,228,154	77.58	100,866,371	130,008,702
1985/86	205,636,838	260,384,102	78.97	100,134,254	126,793,274
1986/87	209,607,086	263,130,200	79.66	96,393,899	121,008,056
1987/88	256,617,601	311,943,550	82.26	101,037,068	122,820,342
1988/89	408,516,942	498,103,000	82.01	115,754,607	141,139,109
1989/90	450,345,446	498,679,000	90.31	114,714,662	127,026,471
1990/91	540,000,000	663,583,000	81.38	117,960,312	144,956,404

Source: Derived from PBDAC Data

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Table 4.7.3 Egypt: In-Kind And Cash Loans During 1981/1982 - 1990/1991

IFDC Fertilizer Policy Impact Study 1993

LE

Year	IN-Kind Loans				Cash Loans			Grand Total All Loans
	Seeds	Fertilizer	Pest Control	Total	Operations	Pest Control	Total	
1981/82	14,809,281	107,408,800	13,726,540	135,944,621	51,441,948	84,214,811	135,656,759	271,601,380
1982/83	18,006,234	137,667,932	16,459,666	172,133,832	52,850,994	91,915,083	144,766,077	316,899,909
1983/84	18,645,767	149,823,688	14,661,036	183,130,491	60,901,204	81,257,637	142,158,841	325,288,332
1984/85	23,964,641	164,655,776	17,466,474	206,086,891	73,957,072	77,942,842	151,899,914	357,986,805
1985/86	48,055,423	205,636,838	25,658,960	279,351,221	172,707,928	65,784,361	238,492,289	517,843,510
1986/87	60,662,073	209,607,086	34,693,419	305,362,578	241,192,661	134,876,883	376,069,544	681,432,122
1987/88	70,530,620	256,617,601	47,453,708	374,601,929	327,325,218	138,196,105	465,521,323	840,123,252
1988/89	77,736,902	408,516,942	55,438,798	541,692,642	339,292,650	189,037,930	528,330,580	1,070,023,222
1989/90	114,952,007	450,345,446	63,222,429	628,519,882	461,474,010	169,028,481	630,502,491	1,259,022,373
1990/91	156,000,000	540,000,000	71,000,000	767,000,000	575,000,000	198,042,732	773,042,732	1,540,042,732

Source: Derived from PBDAC Data

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Table 4.8.1 Egypt: Actual Net Return Per Feddan for Major Crops
IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	72.62	79.11	135.29	50.54	115.12	106.17	129.12
1980/81	120.52	102.85	202.45	52.13	133.55	23.89	114.64
1981/82	105.38	96.03	245.86	89.71	72.17	53.30	117.91
1982/83	105.38	100.42	298.93	71.08	38.13	111.90	55.25
1983/84	128.83	127.84	275.68	6.53	67.64	112.19	240.43
1984/85	228.93	164.17	336.63	220.22	194.82	134.90	472.07
A-Average (80-81)	96.57	90.98	168.87	51.34	124.34	65.03	121.88
B-Average (80-85)	126.94	111.74	249.14	81.70	103.57	90.39	188.24
1985/86	296.82	286.37	378.73	281.89	135.44	155.84	496.26
1986/87	327.51	409.27	672.78	126.28	148.01	249.27	524.99
1987/88	328.53	310.78	564.10	252.80	205.49	407.08	667.23
1988/89	760.99	421.36	538.21	552.43	413.11	582.21	943.44
1989/90	869.16	451.68	740.74	647.17	640.60	654.29	1260.78
1990/91	782.20	360.40	855.80	719.10	1045.83	602.80	1320.60
C-Average (90-91)	825.68	406.04	798.27	683.14	843.22	628.55	1290.69
D-Average (86-91)	560.87	373.31	628.39	426.61	431.41	441.92	872.22
% Change (A to C)	755.01	346.30	372.71	1230.74	578.18	866.55	958.98
% Change (B to D)	341.83	234.10	152.22	422.16	316.54	388.89	363.36
% Growth Rate	26.18	19.12	16.50	32.28	23.78	29.81	30.76
E-Average (1986-88)	317.62	335.47	538.54	213.66	162.98	270.73	569.49
F-Average (1989-91)	804.12	411.15	718.25	639.57	699.85	613.10	1174.94
% Change (E to F)	153.17	22.56	33.37	199.34	329.41	126.48	106.31

Source: Derived from MALR Data

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Table 4.8.2 Egypt: Deflated Net Return Per Feddan for Major Crops
IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	72.62	79.11	135.29	50.54	115.12	106.17	129.12
1980/81	106.06	90.51	178.16	45.88	117.53	21.02	100.89
1981/82	72.38	65.96	168.87	61.62	49.57	36.31	80.99
1982/83	65.57	62.49	186.01	44.23	23.73	69.63	34.38
1983/84	73.46	72.90	157.20	3.72	38.57	63.97	137.10
1984/85	116.87	83.81	171.85	112.42	99.46	68.87	240.99
A-Average (80-81)	89.34	84.81	156.73	48.21	116.32	63.60	115.00
B-Average (80-85)	84.49	75.80	166.23	53.07	73.99	61.05	120.58
1985/86	123.44	119.10	157.51	108.92	56.33	64.81	206.39
1986/87	120.10	150.08	246.71	46.31	54.28	91.41	192.51
1987/88	98.98	93.63	169.95	76.16	61.91	122.64	207.04
1988/89	167.04	103.57	137.20	135.78	101.54	143.10	231.89
1989/90	182.80	95.00	155.79	136.11	134.73	137.61	265.17
1990/91	141.31	65.11	154.61	129.91	188.94	108.90	238.57
C-Average (90-91)	162.06	80.05	155.20	133.01	161.83	123.25	251.87
D-Average (86-91)	142.28	104.41	170.29	105.53	99.62	111.41	223.50
% Change (A to C)	81.39	-5.61	-0.97	175.91	39.12	93.81	119.01
% Change (B to D)	68.39	37.76	2.45	98.86	34.63	82.51	85.44
% Growth Rate	3.48	-2.31	-4.46	8.48	1.51	6.46	30.76
E-Average (1986-88)	114.17	120.94	191.39	77.13	57.50	92.95	201.98
F-Average (1989-91)	170.39	87.89	149.20	133.94	141.74	129.87	245.21
% Change (E to F)	49.23	-27.32	-22.04	73.65	146.48	39.72	21.40

Source: Derived from MALR And CAPMS Data

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Table 4.8.3 Egypt: Actual Total Revenue Per Feddan of Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	214.24	197.13	216.00	213.08	353.70	245.82	523.04
1980/81	273.22	251.60	293.32	248.67	435.08	198.01	547.39
1981/82	334.56	277.50	352.96	328.68	455.89	262.95	627.90
1982/83	334.56	308.72	417.60	334.65	474.06	367.10	680.42
1983/84	393.40	356.00	431.26	330.11	539.21	392.47	909.24
1984/85	521.44	415.70	489.68	565.50	694.37	458.20	1169.25
A-Average (80-81)	243.73	224.37	254.66	230.88	394.39	221.92	535.22
B-Average (80-85)	345.24	301.11	366.80	336.78	492.05	320.76	742.87
1985/86	624.82	559.38	536.80	642.60	676.32	504.07	1274.50
1986/87	680.70	707.76	844.40	550.45	743.36	605.43	1371.22
1987/88	711.63	638.08	760.00	696.22	818.20	804.98	1548.81
1988/89	1168.88	794.18	777.60	1027.14	1065.15	1052.94	2030.40
1989/90	1351.77	941.00	968.00	1163.17	1424.50	1187.29	2444.11
1990/91	1344.60	941.30	1128.00	1413.50	1924.83	1231.20	2874.00
C-Average (90-91)	1348.19	941.15	1048.00	1288.34	1674.67	1209.25	2659.06
D-Average (86-91)	980.40	763.62	835.80	915.51	1108.73	897.65	1923.84
% Change (A to C)	453.15	319.47	311.53	458.02	324.62	444.91	396.82
% Change (B to D)	183.98	153.60	127.86	171.84	125.33	179.85	158.97

Source: Derived from MALR Data

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Table 4.8.4 Egypt: Deflated Total Revenue Per Feddan of Major Crops

IFDC Fertilizer Policy Impact Study 1993

LE/FD

Year	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
1979/80	214.24	197.13	216.00	213.08	353.70	245.82	523.04
1980/81	240.44	221.41	258.13	218.84	382.88	174.25	481.72
1981/82	229.79	190.60	242.43	225.75	313.12	180.60	431.27
1982/83	208.18	192.10	259.85	208.24	294.98	228.43	423.39
1983/84	224.33	203.00	245.91	188.24	307.47	223.80	518.47
1984/85	266.20	212.22	249.98	288.69	354.48	233.91	596.91
A-Average (80-81)	227.34	209.27	237.06	215.96	368.29	210.04	502.38
B-Average (80-85)	230.53	202.74	245.38	223.80	334.44	214.47	495.80
1985/86	259.85	232.64	223.25	267.25	281.27	209.64	530.05
1986/87	249.61	259.54	309.64	201.85	272.59	222.01	502.83
1987/88	214.39	192.23	228.96	209.75	246.50	242.52	466.61
1988/89	287.30	195.20	191.13	252.46	261.80	258.80	499.06
1989/90	284.30	197.91	203.59	244.64	299.60	249.71	514.04
1990/91	242.91	170.05	203.78	255.36	347.73	222.42	519.21
C-Average (90-91)	263.61	183.98	203.69	250.00	323.67	236.07	516.63
D-Average (86-91)	256.40	207.93	226.73	238.55	284.92	234.18	505.30
% Change (A to C)	15.95	-12.08	-14.08	15.76	-12.12	12.39	2.84
% Change (B to D)	11.22	2.56	-7.60	6.59	-14.81	9.19	1.92

Source: Derived from MALR And CAPMS Data

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Table 4.10.1.

EGYPT: Winter, Summer and Nili, and Permanent crops; and Vegetables. (Agricultural Year 1991/92) PRELIMINARY DATA

Crop	Area	Main Product: Unit	Main Product: Yield	Main Product: Production	Main Product: F. Price	Main Product: G. Price	Secondary Product: Yield	Secondary Product: F. Price	Gross Farm Revenue	Cost of Production: V. Cost	Cost of Production: Rent	Cost of Production: T. Cost	Net Farm Revenue
	Feddan (fd)	Unit = kg.	Unit/fd	Unit	LE/Unit	LE/Unit	Heml/fd	LE/Heml	LE/fd	LE/fd	LE/fd	LE/fd	LE/fd
Barley	247,733	Ardab = 120	7.18	1,778,422	58.33		6.90	17.73	530.52	255.60	43.10	298.90	231.62
Perm. Bers. (4cuts)	1,516,419	Ton = 1,000	27.85	42,225,421	50.08				1,354.49	510.60	93.90	604.50	789.99
P. B. (3 cuts+seeds)	152,223	Ardab = 175	1.98	301,090	231.60		4.00	12.41	1,354.13	483.80	115.80	599.60	754.53
Trans. Bers. (2cuts)	721,090	Ton = 1,000	10.55	7,608,551	50.08				528.41	239.90	48.60	288.50	239.91
Broadbeans	390,044	Ardab = 155	3.56	1,387,136	164.02	75.00 f	6.05	15.69	678.24	554.40	93.60	648.00	30.24
Chickpea	14,104	Ardab = 150	4.77	67,283	227.28		5.40	9.18	1,133.97	601.40	87.00	688.40	445.57
Fenugreek	10,870	Ardab = 155	5.32	57,866	154.64		4.49	11.46	874.68	392.80	87.40	480.20	394.48
Flax	29,472	Ardab = 122	4.43	130,653	110.50		2.74 *	147.52 *	894.65	561.40	91.60	653.00	241.65
Garlic: single	14,476	Ton = 1,000	9.57	138,498	185.11				1,771.03	1,062.80	131.00	1,193.80	577.23
Garlic: intercropped	6,394	Ton = 1,000	6.77	47,315	185.11				1,252.28				
Lentils	14,569	Ardab = 160	4.53	65,933	236.20	140.00 f	4.20	19.51	1,150.88	633.60	86.80	720.40	430.48
Lupine	7,090	Ardab = 150	5.24	37,165	225.71		4.35	8.49	1,220.08	490.70	94.60	585.30	634.78
Sugar Beet	38,463	Ton = 1,000	19.34	743,933	~~55.00~~	55.00 f			1,063.78	639.12	80.95	720.07	343.71
Wheat	2,091,653	Ardab = 150	14.72	30,786,647	79.02	75.00 f	11.21	24.20	1,434.36	569.00	95.40	664.40	769.96
Groundnuts	30,848	Ardab = 75	13.12	404,662	77.34	36 - 55 f	~~6.03~~	~~6.51~~	1,042.26	~~616.40~~	~~96.40~~	~~612.80~~	429.46
Summer Maize	1,648,621	Ardab = 140	19.20	31,648,264	60.96	f	~~8.76~~	~~8.48~~	1,244.52	~~561.80~~	~~76.00~~	~~623.40~~	616.12
Nili Maize	317,119	Ardab = 140	14.38	4,560,225	60.96	f	~~8.76~~	~~8.48~~	950.90	~~523.30~~	~~67.80~~	~~591.10~~	359.80
Winter Onion: single	27,899	Ton = 1,000	9.90	276,112	212.00	115.00 c			2,098.13	1,036.78	86.99	1,123.77	974.36
W. Onion: intercr.	43,764	Ton = 1,000	6.84	299,469	212.00				1,450.68				
Summer Onion: single	11,138	Ton = 1,000	8.85	98,529	171.58				1,517.83	1,036.78	86.99	1,123.77	394.06
S. Onion: intercr.	43,656	Ton = 1,000	4.76	207,991	171.58				817.46				
Nili Onion	8,929	Ton = 1,000	10.86	97,004	171.58				1,864.03	1,036.78	86.99	1,123.77	740.26
Summer Rice	1,214,527	Ton = 1,000	3.22	3,908,334	451.41	400.00 f	~~7.25~~	~~6.58~~	1,500.34	747.00	91.40	838.40	661.94
Nili Rice	1,169	Ton = 1,000	1.17	1,372	451.41	400.00 f	~~7.25~~	~~6.58~~	577.50	747.00	91.40	838.40	(260.90)
Sesame	54,297	Ardab = 120	4.34	235,795	259.31	115.00 f	~~5.05~~	~~6.21~~	1,152.41	~~416.80~~	~~86.80~~	~~503.60~~	648.81
Summer Sorghum	335,367	Ardab = 140	15.69	5,260,501	63.14		~~9.00~~	~~7.63~~	1,059.07	~~461.80~~	~~78.00~~	~~539.80~~	519.27
Nili Sorghum	20,178	Ardab = 140	10.30	207,846	63.14		~~9.00~~	~~7.63~~	719.05	~~431.80~~	~~78.00~~	~~539.80~~	179.25
Soybeans	51,994	Ton = 1,000	1.13	58,943	~~810.50~~	810.50 f			918.82	~~550.20~~	~~85.20~~	~~635.40~~	283.42
Cotton: seed Cotton	840,296	Kantar = 157.5	7.15	6,006,371	~~216.14~~	~~216.14~~ m	~~7.20~~	~~8.25~~	2,319.60	~~751.60~~	~~127.40~~	~~879.00~~	1,440.60
Sugar Cane	~~256,933~~	Ton = 1,000	~~43.54~~	~~11,623,574~~	~~68.00~~	~~68.00~~ m			2,873.86	~~1,379.50~~	~~173.90~~	~~1,553.40~~	1,320.56
Summer Potatoes	87,042	Ton = 1,000	9.70	843,978	249.57				2,419.88	~~1,937.00~~	~~68.40~~	~~2,006.40~~	413.48
Nili Potatoes	78,947	Ton = 1,000	7.80	615,998	~~353.71~~				2,759.89	~~2,040.30~~	~~67.60~~	~~2,116.00~~	642.99
Winter Tomatoes	156,309	Ton = 1,000	10.28	1,607,494	429.30				4,414.95	1,347.10	96.70	1,443.80	2,971.15
Summer Tomatoes	124,893	Ton = 1,000	15.42	1,925,387	145.04				2,236.16	1,347.10	96.70	1,443.80	792.36
Nili Tomatoes	80,683	Ton = 1,000	14.39	1,161,104	~~400.31~~				5,760.84	1,347.10	96.70	1,443.80	4,317.04

* : Flax Straw unit is Ton (not heml). Then yield is 2.73 Ton/Feddan, and price is 141.06 LE/ton.

Heml : Camel load (250 kg.)

f : Government Floor Price for optional delivery to the government.

c : Contract price

m : Government Mandatory Price for mandatory delivery to the government of the entire production.

(shaded) : Not applicable   ~~Strikeout:~~ 1990/91 data

F.Price: Farm Price, It is drieved from the government floor price and market price.

G.Price: Government Price, which could be Floor Price, Contract Price or Mandatory Price.

V. Cost & T. Cost: Variable Cost and Total Cost

Note : There is no free market price for Soybeans and Sugar Beet despite the fact that there is optional delivery to the government for all of the two crops. In the case of Cotton and Sugar Cane, all of the two crops must be delivered to the government, as long as all mills for these four crops are owned by the government.

Source: Ministry of Agriculture and Land Reclamation (MALR), Undersecretariat for Agricultural Economics and Statistics (U/AES) files.

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Table 4.10.2 Egypt: Selected Crop and Fertilizer Data 1990/91

IFDC Fertilizer Policy Impact Study 1993

1990/91

Item	Unit	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
Actual Farm Crop Prices	LE/MT	498.13	875.10	282.00	435.80	316.60	441.00	66.00
Actual Fertilizer Prices N	LE/MT	696.00	696.00	696.00	696.00	696.00	696.00	696.00
Actual Fertilizer Prices P2O	LE/MT	856.00	856.00	856.00	856.00	856.00	856.00	856.00
Actual Fertilizer Prices K2O	LE/MT	653.00	653.00	653.00	653.00	653.00	653.00	653.00
Actual Fertilizer Prices NPK	LE/MT	727.00	727.00	727.00	727.00	727.00	727.00	727.00
Crop:Fertilizer Price Rati								
N	Ratio	1.44	0.82	2.54	1.64	2.26	1.62	10.84
P2O5	Ratio	1.77	1.01	3.12	2.02	2.78	1.99	13.33
K2O	Ratio	1.50	0.85	2.65	1.71	2.36	1.69	11.32
N+P2O5+K2O	Ratio	1.50	0.85	2.65	1.71	2.36	1.69	11.32
Crop Production								
Percent of Total Crop Area	%	19.04%	2.51%	15.12%	8.86%	7.34%	18.64%	2.26%
Area Harvested	HA	930,702	122,888	739,200	433,000	358,859	911,000	110,583
Crop Production	MT	4,482,523	307,131	49,016,000	3,152,000	760,000	5,270,000	11,095,209
Yield	MT/HA	4.82	2.50	66.31	7.28	2.12	5.78	100.33
Gross Revenue per Hectar	LE/HA	3201.43	2241.19	2685.71	3365.48	4582.93	2931.43	6842.86
Net Revenue per Hectare	LE/HA	1863.33	858.10	2037.62	1712.14	2490.07	1435.24	3144.29
Fertilizer Use All Crops								
Total N	MT	841,177						
Total P2O5	MT	186,806						
Total K2O	MT	27,715						
Fertilizer Use per Feddan								
N per Fd Crop Area	KG	72.28						
P2O5 per Fd Crop Area	KG	16.05						
K2O per Fd Crop Area	KG	2.38						
NPK per Fd Crop Area	KG	90.72						
N per Fd Cult. Area	KG	133.71						
P2O5 per Fd Cult. Area	KG	29.69						
K2O per Fd Cult. Area	KG	4.41						
NPK per Fd Cult. Area	KG	167.81						

Note: 1.Berseem prices as one cut per feddan.

2.Cotton price in LE per kentar (157.5KG)

Source: Various tables in this report derived from MALR Data

Table 4.10.3 EGYPT: Preliminary Selected Crop and Fertilizer Data 1991/92
IFDC Fertilizer Policy Impact Study 1993

Item	Unit	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
Actual Farm Crop Prices	LE/MT	526.80	1058.19	264.20	451.41	316.14	435.43	66.00
Actual Fertilizer Prices N	LE/MT	1130.00	1130.00	1130.00	1130.00	1130.00	1130.00	1130.00
Actual Fertilizer Prices P2O	LE/MT	1220.00	1220.00	1220.00	1220.00	1220.00	1220.00	1220.00
Actual Fertilizer Prices K2O	LE/MT	770.00	770.00	770.00	770.00	770.00	770.00	770.00
Actual Fertilizer Prices NPK	LE/MT	1134.15	1134.15	1134.15	1134.15	1134.15	1134.15	1134.15
Crop:Fertilizer Price Rati								
N	Ratio	2.15	1.07	4.28	2.50	3.57	2.60	17.12
P2O5	Ratio	2.32	1.15	4.62	2.70	3.86	2.80	18.48
K2O	Ratio	1.46	0.73	2.91	1.71	2.44	1.77	11.67
N+P2O5+K2O	Ratio	2.15	1.07	4.29	2.51	3.59	2.60	17.18
Crop Production								
Percent of Total Crop Area	%	17.72%	3.30%	12.82%	10.30%	7.12%	16.65%	2.26%
Area Harvested	HA	880,021	164,103	636,896	511,480	353,538	827,046	112,307
Crop Production	MT	4,617,997	215,006	42,225,421	3,909,708	946,003	5,069,191	11,623,574
Yield	MT/HA	5.25	1.31	66.30	7.64	2.68	6.13	103.50
Gross Revenue per Fedda	LE/HA	3415.14	1614.85	3320.21	3570.12	5523.33	2850.36	6842.76
Net Revenue per Feddan	LE/HA	1833.24	72.00	1880.93	1573.93	3430.48	1368.50	3144.19
Fertilizer Use All Crops								
Total N	MT	738,950						
Total P2O5	MT	124,930						
Total K2O	MT	21,042						
Fertilizer Use per Feddan								
N per Fd Crop Area	KG	62.48						
P2O5 per Fd Crop Area	KG	10.56						
K2O per Fd Crop Area	KG	1.78						
NPK per Fd Crop Area	KG	74.82						
N per Fd Cult. Area	KG	119.19						
P2O5 per Fd Cult. Area	KG	20.15						
K2O per Fd Cult. Area	KG	3.39						
NPK per Fd Cult. Area	KG	142.72						

Note: 1.Berseem prices as one cut per feddan.
2.Cotton price in LE per kentar(157.5KG)
Source: Preliminary MALR Crop Data supplied by USAID/Cairo
Fertilizer Data Estimated By IFDC

Table 4.10.4 EGYPT: Percent Change in Selected Data 1990/91 to 1991/92
IFDC Fertilizer Policy Impact Study 1993

Percent

Item	Unit	Wheat	Broad Beans	Long Berseem	Rice	Cotton	Maize	Sugarcane
Actual Farm Crop Prices	LE/MT	5.76%	20.92%	-6.31%	3.58%	-0.15%	-1.26%	0.00%
Actual Fertilizer Prices N	LE/MT	62.36%	62.36%	62.36%	62.36%	62.36%	62.36%	62.36%
Actual Fertilizer Prices P2O	LE/MT	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%
Actual Fertilizer Prices K2O	LE/MT	17.92%	17.92%	17.92%	17.92%	17.92%	17.92%	17.92%
Actual Fertilizer Prices NPK	LE/MT	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%
Crop:Fertilizer Price Rati								
N	Ratio	48.96%	30.23%	68.39%	52.64%	58.16%	60.19%	57.94%
P2O5	Ratio	30.84%	14.15%	48.00%	33.79%	38.81%	40.80%	38.67%
K2O	Ratio	-2.56%	-14.39%	9.98%	-0.25%	3.20%	4.64%	3.06%
N+P2O5+K2O	Ratio	43.53%	26.09%	61.99%	46.93%	52.01%	54.12%	51.80%
Crop Production								
Percent of Total Crop Area	%	-6.95%	31.62%	-15.20%	16.22%	-3.03%	-10.68%	0.04%
Area Harvested	HA	-5.45%	33.54%	-13.84%	18.12%	-1.48%	-9.22%	1.56%
Crop Production	MT	3.02%	-30.00%	-13.85%	24.04%	24.47%	-3.81%	4.76%
Yield	MT/HA	8.87%	-47.59%	-0.02%	5.00%	26.22%	6.04%	3.16%
Gross Revenue per Fedda	LE/HA	6.68%	-27.95%	23.63%	6.08%	20.52%	-2.77%	-0.00%
Net Revenue per Feddan	LE/HA	-1.62%	-91.61%	-7.69%	-8.07%	37.77%	-4.65%	-0.00%
Fertilizer Use All Crops								
Total N	MT	-12.15%						
Total P2O5	MT	-33.12%						
Total K2O	MT	-24.08%						
Fertilizer Use per Feddan								
N per Fd Crop Area	KG	-13.56%						
P2O5 per Fd Crop Area	KG	-34.21%						
K2O per Fd Crop Area	KG	-25.21%						
NPK per Fd Crop Area	KG	-17.53%						
N per Fd Cult. Area	KG	-10.86%						
P2O5 per Fd Cult. Area	KG	-32.13%						
K2O per Fd Cult. Area	KG	-23.13%						
NPK per Fd Cult. Area	KG	-14.95%						

Source: Preliminary MALR 1991/92 Crop Data supplied by USAID/Cairo
Fertilizer Data Estimated By IFDC for 1991/92

Table 5.1 . Egypt: Exports and Imports of Major Crops

IFDC Fertilizer Policy Impact Study 1993

Year	Wheat Imports		Maize Imports		Rice Exports		Cotton Exports		Cotton Imports		Sugar Imports	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
1980	2,068,605	303,740	1,227,662	176,784	98,000	23,000	3,281,216	296,372	---	---	323,962	84,742
1981	3,092,410	531,202	1,289,415	219,864	93,018	29,626	3,551,269	319,964	---	---	357,128	166,606
1982	2,919,703	492,235	1,298,640	210,101	22,914	8,129	4,002,603	286,021	---	---	477,499	103,878
1983	2,577,047	347,638	1,397,214	142,034	19,005	4,935	4,177,845	308,775	---	---	309,453	56,482
1984	2,721,348	375,885	1,210,933	174,186	70,845	15,761	3,486,281	340,060	---	---	304,082	54,401
1985	2,356,608	342,518	1,364,221	145,162	16,632	3,779	2,876,038	298,983	111,408	305,538	320,416	45,109
A	2,579,508	417,471	1,258,539	198,324	95,509	26,413	3,416,241	308,168	---	---	340,545	125,674
B	2,618,954	398,866	1,297,661	178,022	53,402	14,242	3,562,542	309,363	---	---	348,753	85,203
1986	3,405,466	463,668	1,117,928	135,843	40,048	11,212	2,912,734	308,441	---	---	492,783	106,954
1987	3,633,274	571,952	1,545,924	231,356	100,843	27,752	2,598,086	272,129	---	---	549,153	175,320
1988	3,575,568	825,123	1,124,159	265,261	71,352	19,572	1,598,179	310,579	92,186	68,469	511,199	307,401
1989	3,069,112	1,307,688	1,292,684	443,667	32,904	17,958	1,168,249	594,161	278,696	41,857	379,645	349,283
1990	4,456,272	2,128,533	1,297,189	513,660	75,718	54,927	787,791	562,213	546,575	166,207	509,091	607,106
1991	4,116,060	1,614,697	1,006,691	428,491	150,951	123,334	259,735	143,351	267,818	346,589	179,361	173,287
C	4,286,166	1,871,615	1,151,940	471,076	113,335	89,131	523,763	352,782	---	---	344,226	390,197
D	3,709,292	1,151,944	1,230,746	336,463	78,636	42,459	1,554,129	366,479	---	---	436,872	286,559
E	66.16218	348.32216	-8.47002	137.52824	18.66369	237.44936	-84.66844	14.47717	---	---	1.08091	210.48308
F	41.63280	188.80439	-5.15805	89.00097	47.25199	198.13341	-56.37583	18.84681	---	---	25.26676	236.32443

Note: Quantities in Tons Except Cotton in Kentar and values in Thousand Egyptian Pounds

A, B, C and D are the average of 1980-81, 1980-85, 1990-91 and 1986-91 respectively

E is the percent change for C to A

F is the percent change from D to B

Source: Derived from CAPMS data

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Table 5.2 Egypt: Deflated Value of Exports and Imports of Major Crops
IFDC Fertilizer Policy Impact Study 1993

Year	Wheat Imports	Maize Imports	Rice Exports	Cotton Exports	Cotton Imports	Sugar Imports
1980	303,740	176,784	23,000	296,372	0	84,742
1981	488,540	202,206	27,431	294,267	0	153,226
1982	418,320	178,552	6,908	243,072	0	88,280
1983	238,583	97,518	3,402	212,000	0	38,780
1984	229,364	106,294	9,618	207,515	0	33,197
1985	178,316	75,572	1,967	155,651	159,063	23,484
A	396,140	189,495	25,215	295,320	0	118,984
B	309,494	139,488	12,054	234,813	0	70,285
1986	191,878	56,215	4,640	127,641	0	44,260
1987	223,532	90,615	10,846	106,354	0	68,519
1988	276,089	88,757	6,549	106,598	22,910	102,858
1989	314,897	106,837	4,324	143,077	10,079	84,109
1990	460,776	111,195	11,890	121,706	35,980	131,424
1991	299,757	79,546	22,896	26,612	64,344	32,170
C	380,267	95,371	17,393	74,159	50,162	81,797
D	294,488	88,861	10,191	105,331	0	77,223
E	-4.00703	-49.67118	-31.02114	-74.88861	0	-31.25393
F	-4.84842	-36.29474	-15.45849	-55.14248	0	9.87212

Note: Value in thousand LE

A, B, C and D are the average of 1980-81, 1980-85, 1990-91 and 1986-91 respectively
E is the percent change for C to A
F is the percent change from D to B

Source: Derived from CAPMS data

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Table 6.2.1 EGYPT: Domestic Fertilizer Production Companies

IFDC Fertilizer Policy Impact Study 1993

Company	Plant	Location	Annual Capacity	Annual Production 1988/89	1989/90	1990/91	'000 MT 1991/92
Abu Qir Fertilizers	Urea	Abu Qir	460	522	510	463	460
	AN	Abu Qir	750				500
El Nasr	Urea	Talkha	480	424	463	460	368
	AN	Talkha	280	304	288	260	190
	AS	Suez	100	57	53	50	50
	CN	Suez	230	253	251	225	235
	AN	Suez	330	to be commissioned in 1993			
Egyptian Chemical Industry Co.	AN	Kima	280	278	281	271	258
El Nasr for Coke	AN	Helwan	60	46	43	49	59
	AS	Helwan	12	12	13	13	12
Abu Zaabal Fertilizer and Chemical Co.	SSP	Abu Zaabal	360	277	301	310	325
	CSP	Abu Zaabal	130	118	108	84	120
	TSP	Abu Zaabal	3				3
Kafr El Zaiyat	SSP	Kafr El Zaiyat	770	746	790	748	660
	SSP	Assiut					

Source: CIC

Table 6.2.2 EGYPT: Total Fertilizer Supply 1982/83 to 1992/93 (6 months)

IFDC Fertilizer Policy Impact Study 1993

	PRODUCT:	UREA	A.N.	NH3	C.A.N.	C.N.	A.S.	SSP	CSP	TSP	SUL.POT.	TOTAL	TOTAL NUTRIENTS		
	ANALYSIS:	46%N	33.5%N	82% N	31.5%N	15.5%N	20.6%N	15%P2O5	37.5%P2O5	46%P2O5	48%K2O		N	P2O5	K2O
PRODUCTION															
	1982/83	833000	61000	0	679222	281326	11500	589000	0			2435048	660444	88350	0
	1983/84	825000	71000	0	661950	214160	58900	854000	0			2685010	657127	128100	0
	1984/85	829000	70000	0	578040	203146	95840	930000	0			2706025	636103	139500	0
	1985/86	950000	70000	0	585196	217160	87000	934000	63000			2906356	696369	163725	0
	1986/87	901000	66000	0	572048	237000	77200	957000	100000			2910248	669403	181050	0
	1987/88	897000	53000	0	512630	254000	73500	986000	112000			2888130	646364	189900	0
	1988/89	946000	628000	0	0	253000	69400	1021000	118000			3035400	699051	197400	0
	1989/90	973000	612000	0	0	251000	65800	1091000	108000			3100800	705060	204150	0
	1990/91	923000	580000	0	0	225000	63200	1058000	84000			2933200	666774	190200	0
	1991/92	923000	1007000	67777	0	235000	62000	985000	120000	2000		3401777	811122	193670	0
6 months	1992/93	414910	646379	8074	0	47335	26489	319642	48412	6000		1517241	420189	68861	0
IMPORTS															
	1982/83	0	0	0	0	0	131238	0	0	160421	24961	316620	27035	73794	11981
	1983/84	0	0	0	0	0	70000	0	0	71725	55211	196936	14420	32994	26501
	1984/85	0	62310	0	0	0	161452	0	0	49387	35175	308324	54133	22718	16884
	1985/86	78659	173209	0	0	0	472463	0	0	0	50011	774342	191536	0	24005
	1986/87	0	70367	0	0	0	220586	0	0	0	60301	351254	69014	0	28944
	1987/88	0	124691	0	0	0	179184	0	0	0	69872	373747	78683	0	33539
	1988/89	0	341954	0	0	0	278520	0	0	0	80088	700562	171930	0	38442
	1989/90	0	226016	0	0	0	271788	0	0	0	14920	512724	131704	0	7162
	1990/91	0	206719	0	0	0	410941	0	0	0	128384	746044	153905	0	61624
	1991/92	0	109738	0	6000	0	131867	0	0	0	16379	263984	65817	0	7862
6 months	1992/93	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL SUPPLY															
	1982/83	833,000	61,000	0	679,222	261,326	142,738	589,000	0	160,421	24,961	2,751,668	687,479	162,144	11,981
	1983/84	825,000	71,000	0	661,950	214,160	128,900	854,000	0	71,725	55,211	2,881,946	671,547	161,094	26,501
	1984/85	829,000	132,310	0	578,040	203,146	257,292	930,000	0	49,387	35,175	3,014,350	692,236	162,218	16,884
	1985/86	1,028,659	243,209	0	585,196	217,160	559,463	934,000	63,000	0	50,011	3,680,698	887,904	163,725	24,005
	1986/87	901,000	136,367	0	572,048	237,000	297,786	957,000	100,000	0	60,301	3,261,502	738,417	181,050	28,944
	1987/88	897,000	177,691	0	512,630	254,000	252,684	986,000	112,000	0	69,872	3,261,877	725,048	189,900	33,539
	1988/89	946,000	969,954	0	0	253,000	347,920	1,021,000	118,000	0	80,088	3,735,962	870,981	197,400	38,442
	1989/90	973,000	838,016	0	0	251,000	337,588	1,091,000	108,000	0	14,920	3,613,524	836,763	204,150	7,162
	1990/91	923,000	786,719	0	0	225,000	474,141	1,058,000	84,000	0	128,384	3,679,244	820,679	190,200	61,624
	1991/92	923,000	1,116,738	67,777	6,000	235,000	193,867	985,000	120,000	2,000	16,379	3,663,761	876,939	193,670	7,862
6 months	1992/93	414,910	646,379	8,074	0	47,335	26,489	319,642	48,412	6,000	0	1,517,241	420,189	68,861	0

Source: PBDAC and CIC

Table 6.2.2 EGYPT: Total Fertilizer Exports, Domestic Deliveries and Consumption, 1982/83 to 1992/93 (6 months) (continued)

IFDC Fertilizer Policy Impact Study 1993

	PRODUCT	UREA	A.N.	NH3	C.A.N.	C.N.	A.S.	SSP	CSP	TSP	SUL.POT.	TOTAL	TOTAL NUTRIENTS		
EXPORTS	ANALYSIS	46%N	33.5%N	82% N	31.5%N	15.5%N	20.6%N	15%P2O5	37.5%P2O	46%P2O5	48%K2O		N	P2O5	K2O
	1982/83	178281	0	0	0	0	0	0	0	0		178281	82000	0	0
	1983/84	29965	0	0	0	0	0	0	0	0		29985	13784	0	0
	1984/85	0	0	0	0	0	0	0	0	0		0	0	0	0
	1985/86	0	0	0	0	0	0	0	0	0		0	0	0	0
	1986/87	0	0	0	0	0	0	0	0	0		0	0	0	0
	1987/88	0	0	0	0	0	0	0	0	0		0	0	0	0
	1988/89	0	0	0	0	0	0	0	0	0		0	0	0	0
	1989/90	60000	0	0	0	0	0	0	0	0		60000	27600	0	0
	1990/91	55000	0	0	0	0	0	0	0	0		55000	25300	0	0
	1991/92	154732	167248	67777	0	0	0	5124	0	1700		396581	182782	1551	0
6 months	1992/93	70383	143080	8074	0	0	0	5009	3415	5680		235641	86929	4645	0
DOMESTIC DELIVERIES															
	1982/83	813261	62192	0	679222	261326	10158	586237	0			2412396	651487	87936	0
	1983/84	528533	68395	0	661950	214160	59107	853313	0			2385458	519923	127997	0
	1984/85	697255	70621	0	578040	203146	95840	936280	0			2581182	577709	140442	0
	1985/86	927544	67273	0	585196	217160	85995	953661	63000			2899829	684918	166674	0
	1986/87	916893	53044	0	572048	214343	76636	955831	99140			2887935	668746	180552	0
	1987/88	862485	164006	0	512630	253227	66635	993460	110600			2963043	666141	190494	0
	1988/89	925000	618000	0	0	247100	69400	993000	117100			2969600	685127	192863	0
	1989/90	918000	593000	0	0	225000	65800	1085000	105300			2992100	669365	202238	0
	1990/91	862000	579000	0	0	220000	63200	940000	34000			2698200	637604	153750	0
	1991/92	732000	872000	0	0	208000	62000	699000	52000			2625000	673852	124350	0
6 months	1992/93	336043	606050	0	0	48173	22752	379158	4079			1396255	369760	58403	0
CONSUMPTION															
	1982/83	808,621	82,099	0	601,137	255,739	154,942	573,920	0	126,152	19,978	2622588	660385	144118	9589
	1983/84	991,144	81,803	0	615,057	270,575	132,590	733,841	0	110,106	36,400	2971516	746326	160725	17472
	1984/85	738,751	112,018	0	588,069	223,570	212,061	862,037	0	77,251	50,506	2864263	840931	164841	24243
	1985/86	897,983	227,203	0	577,274	208,855	365,363	1,070,534	31,916	24,162	50,767	3454055	778563	183683	24388
	1986/87	923,336	156,180	0	583,016	223,158	396,508	989,586	94,747	3,129	60,181	3430141	777037	185407	28887
	1987/88	960,290	224,955	0	528,237	246,903	351,499	1,012,118	102,952	1,003	61,442	3489399	794167	190886	29492
	1988/89	838,591	895,860	0	0	230,070	334,264	951,128	100,321	0	56,322	3406576	790388	180290	27035
	1989/90	950,842	871,419	0	0	246,575	324,104	968,579	66,085	0	44,143	3471747	834297	170069	21189
	1990/91	974,902	811,984	0	0	244,337	402,111	1,042,029	81,338	0	57,740	3614441	841177	186806	27715
	1991/92	747,252	1,017,988	0	6,000	188,488	289,306	748,338	33,911	0	43,837	3075020	775465	124930	21042
6 months	1992/93	372,844	693,462	0	0	58,383	108,356	447,254	26,463	0	22,229	1728991	435189	77012	10670

Source: PBDAC and CIC

Table 6.2.3. EGYPT: Private Sector Factory Agents by Production Company, 1989/90 to 1992/93.
IFDC Fertilizer Policy Impact Study 1993

Company	1989/90	1990/91	1991/92	1992/93
El Nasr(Talkha)	0	0	11	5(2)
El Nasr (Suez)	0	0	6	5(2)
Abu Qir	0	5	34	10(10)
Abu Zabaal	0	0	15	9(1)
Kafr El Zaayiat	0	0	10	10(0)
Kima	0	0	n.a.	n.a.
El Nasr for Coke	0	0	n.a.	n.a.
Total	0	5	76	39(15)

Notes: 1. Private Sector factory agents are defined as companies signing lifting contracts.
2. Kima factory has a number of lifting contracts with wholesalers in Upper Egypt.
3. Abu Zaabal contracts in 1992/93 include one for 100,000 tons SSP.
4. In addition to private sector factory agents public sector organizations also have lifting contracts.
5. Figure in parenthesis indicate net number of distributors

Table 6.2.4 EGYPT: Estimated Market Share by Largest Distributors, July - December 1992

IFDC Fertilizer Policy Impact Study 1993

	Urea	AN	AS	CN	All Products
Distributor 1	19.0%	10.4%	13.9%	24.8%	13.6%
Distributor 2	7.7%	4.2%	3.7%	3.7%	3.8%
Distributor 3	7.7%	4.2%	3.7%	19.8%	4.6%
Distributor 4	10.1%	9.7%	0.0%	0.7%	6.8%
Other Private	27.6%	31.5%	4.3%	6.0%	29.8%
Total Private	72.1%	60.0%	25.6%	55.0%	58.0%
Coops	15.6%	16.4%	1.8%	2.5%	15.7%
E.A.O.	2.4%	5.0%	0.0%	0.0%	4.1%
PBDAC	9.9%	18.6%	72.6%	42.5%	21.6%
Total	100.0%	100.0%	100.0%	100.0%	99.4%

Source: Estimated from total factory liftings, contracts, and PBDAC sales.

Table 6.2.5 EGYPT: Ex-Factory Prices,Production Costs and Margins, 1988/89 to 1992/93

IFDC Fertilizer Marketing Policy Study 1993

Company	Product	Item	1988/89	1989/90	1990/91	1991/92	1992/93	Border Price 1992/93
			<------------	------------	------------	LE/mt ------------	------------	------------>
Abu Qir	Urea	Ex-Factory Price	209.40	209.40	385.00	420.00	450.00	420.00
		Production Cost	181.00	195.00	218.00	335.00	351.75	351.75
		Margin	28.40	14.40	167.00	85.00	98.25	68.25
El Nasr	Urea	Ex-Factory Price	209.40	209.40	380.00	400.00	441.00	420.00
		Production Cost	175.00	172.00	192.00	260.00	273.00	273.00
		Margin	34.40	37.40	188.00	140.00	168.00	147.00
Abu Qir	AN	Ex-Factory Price				380.00	395.00	366.00
		Production Cost				362.00	380.10	380.10
		Margin				18.00	14.90	-14.10
El Nasr	AN	Ex-Factory Price	152.00	152.00	156.00	263.00	345.00	328.00
		Production Cost	133.00	151.00	154.00	235.00	246.75	248.75
		Margin	19.00	1.00	2.00	28.00	98.25	79.25
Kima	AN	Ex-Factory Price	209.00	249.00	284.00	298.20	338.60	366.00
		Production Cost	205.00	208.00	320.00	465.00	488.25	488.25
		Margin	4.00	41.00	-36.00	-166.80	-149.65	-122.25
El Nasr for Coke	AN	Ex-Factory Price	239.00	239.00	338.60	338.60	338.60	326.00
		Production Cost	320.00	365.00	415.00	430.00	451.50	451.50
		Margin	-81.00	-126.00	-76.40	-91.40	-112.90	-125.50
El Nasr	AS	Ex-Factory Price	195.00	195.00	232.00	295.00	316.00	250.00
		Production Cost	201.00	233.00	252.00	285.00	299.25	299.25
		Margin	-6.00	-38.00	20.00	10.00	16.75	-49.25
El Nasr for C	AS	Ex-Factory Price	171.00	171.00	203.00	264.60	281.00	240.00
		Production Cost	283.00	332.00	335.00	382.00	401.10	401.10
		Margin	-112.00	-161.00	-132.00	-117.40	-120.10	-161.10
El Nasr	CN	Ex-Factory Price	116.00	116.00	139.00	194.25	205.00	151.00
		Production Cost	146.00	146.00	265.00	280.00	294.00	294.00
		Margin	-30.00	-30.00	-126.00	-85.75	-89.00	-143.00
Abu Zaabal	SSP	Ex-Factory Price	111.00	146.00	183.00	175.00	182.00	178.00
		Production Cost	126.00	150.00	163.00	178.00	186.90	186.90
		Margin	-15.00	-4.00	18.00	-3.00	-4.90	-8.90
Kaf'r El Zaiya	SSP	Ex-Factory Price	101.00	152.00	183.75	183.75	182.00	178.00
		Production Cost	118.00	134.00	169.00	182.00	191.10	191.10
		Margin	-17.00	18.00	15.75	1.75	-9.10	-13.10
Abu Zaabal	CSP	Ex-Factory Price	300.00	395.00	400.00	380.00	350.00	350.00
		Production Cost	330.00	378.00	405.00	415.00	435.75	435.75
		Margin	-30.00	17.00	-5.00	-35.00	-85.75	-85.75

Note: Production costs for 1992/93 estimated at 5% above 1991/92 levels.
Border prices for 1992/93 based on Table
Margins for 1992/93 border price equivalent ex-factory prices shown in last column
Source: PBDAC, CIC

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Table 6.3.1 EGYPT: Import Costs of Potassium Sulfate, 1993

IFDC fertilizer Policy Impact Study 1993

Cost Item	Rate	LE per MT	US $ perMT
C&F in US$			230.00
Exchange Rate	3.33		
C&F		765.90	
Tarriff	5% c&f	38.30	
Insurance	2.75% c&f	21.06	
Agent's Commission	1% c&f	7.66	
Inspection fees, port charges	1% c&f	7.66	
Losses	0.5% cif	3.93	
Bulk Discharging		6.00	
Bagging with machinery		9.00	
Bags		22.00	
Sub-total		881.51	
PBDAC Costs and Margin		38.49	
Total Bagged ex-Alexandria		920.00	

Source: PBDAC, Import Agent and IFDC estimates

Table 6.4.1 EGYPT: Calculation of Fertilizer Border Equivalent Prices

IFDC Fertilizer Policy Impact Study 1993

Product	Urea Abu Qir (bulk)	Urea Talkha (bulk)	AN Abu Qir	AN Talkha	CN Estimate	AS Import	GTSP Import	SSP Estimate
c&f price in US$/mt						51.00		
Insurance US$/mt						1.40		
c.i.f. Price in US$/mt						52.40	180.00	
f.o.b. Price in US$/mt	130.00	133.00	116.00					
Exchange Rate	3.33	3.33	3.33	3.33		3.33	3.33	
	<----------------	----------------	----------------	----------------	LE/MT	----------------	----------------	----------------
Border price	432.90	442.89	366.28			174.50	599.40	599.40
Loading/Unloading	-8.00	-8.00	-10.00			9.00	2.31	2.31
Transport to port	-8.00	-12.00	-8.00			0.00	0.00	0.00
Extra bag cost	20.00	20.00	-2.00			25.80	0.00	0.00
Nutrient adjustment	0.00	0.00	0.00		175.28	0.00	-111.19	-405.50
Sub total	436.90	442.89	366.28	366.28		209.30	490.52	196.21
Losses (0.5%)	2.18	2.21				1.05	2.45	0.98
Quality Adjustment	0.00	0.00	0.00	-40.00		40.00	-49.30	-19.72
Border Price Equivalen	**439.08**	**445.10**	**366.28**	**326.28**	**151.00**	**250.35**	**443.68**	**177.47**
Current Ex-factory pric	450.00	450.00	395.00	345.00	205.00	360.00	350.00	182.00
Variance from Border Price Equivalent	2.5%	1.1%	7.8%	5.7%	35.8%	43.8%	-21.1%	2.6%

Note: f.o.b. prices for exports are actual realizations 1992/93

c.i.f. prices for imports are actual costs 1992/93

no allowance has been made for calcium content of Calcium Nitrate in nutrient adjustment

quality adjustment of Granular TSP based on cost of granulation

Source: IFDC Estimates based on PBDAC and Production Company data and current world market prices.

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Table 6.4.2 International Fertilizer Prices 1992

IFDC Fertilizer Policy Impact Study 1993

Month	Product Source	Urea E.Europe	Urea Mid. East	AS E.Europe	TSP N.Africa	TSP US Gulf	DAP US Gulf	DAP N.Africa
							US$/MT FOB BULK	
Jan		92.50	147.50	30.00	142.50	121.00	163.00	177.50
Feb		92.50	145.63	30.00	142.50	121.38	163.00	181.67
Mar		92.50	135.00	30.00	142.50	119.50	156.00	179.50
April		92.50	135.00	30.00	142.50	119.13	150.75	170.00
May		92.50	135.00	30.00	142.50	121.00	150.88	172.50
June		92.50	138.00	30.00	142.50	119.80	143.90	172.50
July		92.50	142.50	30.00	142.50	119.00	137.38	172.50
Aug		107.50	142.50	30.00	142.50	119.00	137.60	172.50
Sept		107.50	142.50	30.00	142.50	119.38	135.75	163.50
Oct		107.50	139.63	30.00	142.50	119.50	135.63	160.50
Nov		107.50	131.00	nm	142.50	119.50	134.40	160.50
Dec		107.50	131.00	nm	142.50	120.00	134.67	160.50
Average		98.75	138.77	30.00	142.50	119.85	145.25	170.31

Note: nm = no market

Source: IFDC, derived from Green Markets mid-point weekly quotations.

Table 7.2.1 EGYPT: Fertilizer Contracts with Production Companies by Marketing Channel 1991/92.

IFDC Fertilizer Policy IMpact Study 1993

COMPANY	PBDAC	%	EAO	%	CO-OP	%	DISTRI	%	WHLS	%	TOTAL
	Contract Volumes ('000 mt)										
Abu Qir Urea	143	49%	24	8%	72	25%	33	11%	17	6%	289
El Nasr Urea	60	22%	20	7%	20	7%	100	37%	70	26%	270
Total Urea	203	36%	44	8%	92	16%	133	24%	87	16%	559
Abu Qir AN	157	50%	26	8%	78	25%	37	12%	18	6%	316
El Nasr AN	20	18%	30	27%	10	9%	50	45%	0	0%	110
Coke AN	56	93%	0	0%	4	7%	0	0%	0	0%	60
Kima AN	98	37%	20	8%	35	13%	75	29%	34	13%	262
Total AN	331	44%	76	10%	127	17%	162	22%	52	7%	748
El Nasr CN	120	66%	3	2%	20	11%	30	16%	10	5%	183
El Nasr AS	50	100%	0	0%	0	0%	0	0%	0	0%	50
Coke AS	12	100%	0	0%	0	0%	0	0%	0	0%	12
Total AS	62	100%	0	0%	0	0%	0	0%	0	0%	62
Abu Zaabal SSP	150	81%	0	0%	20	11%	15	8%	0	0%	185
Kafr El Za. SSP	258	39%	50	8%	180	27%	100	15%	72	11%	660
Total SSP	408	48%	50	6%	200	24%	115	14%	72	9%	845
Abu Zaabal CSP	15	29%	0	0%	20	38%	10	19%	7	13%	52
Total Product	1139	47%	173	7%	459	19%	450	18%	228	9%	2449
Total N	236	43%	46	8%	88	16%	120	22%	59	11%	549
Total P2O5	67	46%	8	5%	30	26%	21	14%	13	9%	146

DISTRIB and WHLS: Private Sector Distributors and Wholesalers

Source: Chemical Industries Company.

Table 7.2.2 EGYPT: Estimated Factory Liftings by Sector 1991/92 and July to December 1992

IFDC Fertilizer Policy Impact Study 1993

July - June 1991/92 ('000 mt)

Sector	Urea	AN	CN	AS	SSP	CSP	TOTAL
PBDAC	355	409	178	62	515	17	1,536
EAO	65	100	2	0	18	0	185
COOPS	92	129	10	0	82	18	331
Private	220	234	18	0	84	17	573
Total	732	872	208	62	699	52	2,625

July - December 1992

PBDAC	0	41	0	0	0	0	41
EAO	58	114	2	2	61	0	237
COOPS	9	35	0	0	26	1	71
Private	269	606	46	21	248	3	1,194
Total	336	796	48	23	335	4	1,542

Share of Total Liftings

July - June 1991/92

Sector	Urea	AN	CN	AS	SSP	CSP	TOTAL
PBDAC	48.5%	46.9%	85.6%	100.0%	73.7%	32.7%	58.5%
EAO	8.9%	11.5%	1.0%	0.0%	2.6%	0.0%	7.0%
COOPS	12.6%	14.8%	4.8%	0.0%	11.7%	34.6%	12.6%
Private	30.1%	26.8%	8.7%	0.0%	12.0%	32.7%	21.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

July - December 1992

PBDAC	0.0%	5.2%	0.0%	0.0%	0.0%	0.0%	2.7%
EAO	17.3%	14.3%	3.2%	8.9%	18.1%	0.0%	15.3%
COOPS	2.7%	4.4%	0.0%	0.0%	7.8%	26.5%	4.6%
Private	80.0%	76.1%	96.8%	91.1%	74.1%	73.5%	77.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Based on Factory contract data and CIC lifting data

Table 7.2.3 EGYPT: Urea Factory Distribution Lifting Contracts by Product and Sector, 1992/93.

IFDC Fertilizer Policy Impact Study 1993

Company	Product	Distributor	Sector	Contract Tons	Percent of Total	Main Area Served (1)	Number of Wholesaler
El Nasr	Urea	El Dawlia Co.	private	180000	46.6%	All	300
		Hagras	private	96000	24.9%	All	200
		Afro-Asia Co.	private	96000	24.9%	Lower Egypt	30
		Wholesaler 1	private	6000	1.6%	Lower Egypt	?
		Wholesaler 2	private	1000	0.3%	Lower Egypt	?
		Cooperatives	coop.	7000	1.8%		
	Urea	Sub Total	-	386000	100.0%		530+
Abu Qir	Urea	Gharbaya Co.	private	75000	9.4%	All	100
		El Dawlia Co.	private	48000	6.0%	All	300
		Fert. Distrib. Union	private	48000	6.0%	?	6
		Egyptian Union	private	48000	6.0%	All	6
		Abu Donki Co.	private	48000	6.0%	Low.& Mid. Egypt	?
		Abu Hussain Co.	private	48000	6.0%	All (Beheira)	?
		Arabic Union	private	48000	6.0%	?	6
		Abu Ghonima Co.	private	48000	6.0%	Gharbia & Menoufia	?
		M. Shama	private	36000	4.5%	All	?
		El Samahi Co.	private	75000	9.4%	All	300
		General Soc.for Credit	coop.	24000	3.0%	All	
		Central Assuit Soc. for Credit	coop.	18000	2.3%	Assuit	
		Central Gharbia Soc. for Credit	coop.	132000	16.6%	Gharbia	
		Central Menofia Soc. for Credit	coop.	15000	1.9%	Menofia	
		Central Dakahlia Soc. for Credit	coop.	12000	1.5%	Dakahlia	
		Central Qena Soc. for Credit	coop.	25000	3.1%	Qena	
		Egptian Agric. Organization	Public	30000	3.8%	All	
		Gen. Co. for Trade	public	18000	2.3%	?	
	Urea	Sub Total	-	796000	100.0%		420+
All Factories	Urea	Total	Private	901000	76.2%		
		Total	Coop.	233000	19.7%		
		Total	Public	48000	4.1%		
	Urea	Total	All	1182000	100.0%		

Note (1) : Information in parenthesis indicates main area of operations

Source: Production companies, Distributors and IFDC Estimates

Table 7.2.4 EGYPT: AN Factory Distribution Lifting Contracts by Product and Sector, 1992/93.

IFDC Fertilizer Policy Impact Study 1993

Company	Product	Distributor	Sector	Contract Tons	Percent of Total	Main Area Served (1)	Number of Wholesaler
El Nasr	AN	El Dawlia Co.	private	72000	39.6%	All	300
		Hagras	private	48000	26.4%	All	200
		Afro-Asia Co.	private	48000	26.4%	Lower Egypt	30
		Wholesaler 1	private	6000	3.3%	Lower Egypt	?
		Wholesaler 2	private	2000	1.1%	Lower Egypt	?
		Cooperatives	coop	6000	3.3%		
	AN	Sub Total	-	182000	100.0%		530+
Abu Qir	AN	Gharbaya Co.	private	112500	15.0%	All	100
		El Dawlia Co.	private	48000	6.4%	All	300
		Fert. Distrib. Union	private	48000	6.4%	?	6
		Egyptian Union	private	48000	6.4%	All	6
		Abu Donki Co.	private	48000	6.4%	Low.& Mid. Egypt	?
		Abu Hussain Co.	private	48000	6.4%	All (Beheira)	?
		Arabic Union	private	48000	6.4%	?	6
		Abu Ghonima Co.	private	48000	6.4%	Gharbia & Menoufia	?
		M. Shama	private	36000	4.8%	All	?
		El Samahi Co.	private	37000	4.9%	All	300
		General Soc.for Credit	coop.	24000	3.2%	All	
		Central Gharbia Soc. for Credit	coop.	132000	17.5%	Gharbia	
		Central Menofia Soc. for Credit	coop.	15000	2.0%	Menofia	
		Central Dakahlia Soc. for Credit	coop.	12000	1.6%	Dakahlia	
		Gen. Co. for Trade	public	18000	2.4%	?	
		Egyptian Agric. Organization	public	30000	4.0%	All	
	AN	Sub Total	-	752500	100.0%		420+
Kima	AN	Private	private	153000	56.8%	Upper Egypt	140+
		Cooperative	coop.	35000	13.0%	Upper Egypt	
		PBDAC	public	41170	15.3%	Upper Egypt	
		Egyptian Agric. Organization	public	40000	14.9%	Upper Egypt	
	AN	Sub Total	-	269170	100.0%		140+
El Nasr for Coke	AN	Private	private	54000	93.1%	Low.& Mid. Egypt	?
		Cooperative	coop.	4000	6.9%		
		Public	public	0	0.0%		
	AN	Sub Total		58000	100.0%		
All Factories	AN	Total	private	904500	45.3%		
			coop.	228000	11.4%		
			public	863670	43.3%		
	AN	Total	All	1996170	100.0%		

Note (1) : Information in parenthesis indicates main area of operations

Source: Production companies, Distributors and IFDC Estimates

Table 7.2.5 EGYPT: Factory Distribution Lifting Contracts by Product and Sector, 1992/93.
IFDC Fertilizer Policy Impact Study 1993

Company	Product	Distributor	Sector	Contract Tons	Percent of Total
El Nasr	AS	El Dawlia Co.	private	45000	58.4%
		Hagras	private	12000	15.6%
		Afro-Asia Co.	private	12000	15.6%
		Wholesaler 1	private	0	0.0%
		Wholesaler 2	private	2000	2.6%
		Cooperatives	coop.	6000	7.8%
	AS	Sub Total	-	77000	100.0%
El Nasr for Coke	AS		Private	12000	
	AS	private	Private	83000	93.3%
		cooperative	Coop.	6000	6.7%
		public	Public	0	0.0%
	AS	Total	All	89000	100.0%
El Nasr	CN	El Dawlia Co.	private	60000	45.8%
		Hagras	private	9000	6.9%
		Afro-Asia Co.	private	48000	36.6%
		Wholesaler 1	private	2000	1.5%
		Wholesaler 2	private	6000	4.6%
		Cooperatives	coop.	6000	4.6%
	CN	Sub Total	-	131000	100.0%
	CN	Total	private	125000	95.4%
			coop.	6000	4.6%
			public	0	0.0%
	CN	Total	All	131000	100.0%
Abu Zaabal	SSP	?	private	100000	43.5%
		8 other	private	80000	34.8%
		cooperatives	coop	20000	8.7%
		Egyptian Agric. Organization	public	30000	13.0%
	SSP	Sub Total	-	230000	100.0%
Kafr El Zaid	SSP	Private		?	
		Cooperatives		?	
		Egyptian Agric.Organization		30000	

Source: production companies, distributors.

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Table 7.2.6 EGYPT: Fertilizer Purchases by Major Source, January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Comparison by Governorates

Governorate	Urea		AN		SSP	
	Private	Public	Private	Public	Private	Public
	(Percent of Fertilizer Purchased)					
Aswan	-	-	8	92	8	92
Qena	80	20	90	10	95	5
Sohag	32	68	32	68	37	63
Assuit	25	75	3	97	17	83
Upper Egypt	28	72	28	72	26	74
Minya	14	86	4	96	3	97
Beni Suef	17	83	21	79	29	71
Fayoum	55	45	47	53	32	68
Giza	23	77	13	88	-	-
Middle Egypt	29	71	18	82	16	84
Alexandria	100	0	50	50	12	88
Behira	43	57	30	70	28	72
Daqalia	29	71	5	95	6	94
Damietta	75	25	75	25	19	81
Gharbaiya	39	61	54	46	47	53
Ismailia	28	72	27	73	43	57
Kafr el Shk.	28	72	22	78	21	79
Menofiya	51	49	26	74	27	73
Qalubia	32	68	8	92	7	93
Sharquia	30	60	28	72	25	75
Lower Egypt	40	60	28	72	25	75
TOTAL	35	65	25	75	24	76

Source: APCP and MALR Price Survey 1992. Unpublished personal communication, R. Krenz, Chemonics, Cairo.

Table 7.3.1 EGYPT: Development of Private Licenses for Trading Fertilizers and Pesticides 1992

IFDC Fertilizer Policy Impact Study 1993

Governorate	June 1992	September 1992	December 1992	Percent increase Jun-Dec 1992	Percent of Total Dec 1992
BEHEIRA	23	27	30	30.4%	3.4%
KAFR EL SHEIK	26	31	35	34.6%	3.9%
GHARBIA	66	70	75	13.6%	8.4%
DAKAHILA	89	104	112	25.8%	12.6%
DAMIETTA	3	7	8	166.7%	0.9%
SHARKIA	45	49	50	11.1%	5.6%
ISMAILIA	23	27	31	34.8%	3.5%
MENOFIA	46	59	72	56.5%	8.1%
KALUBIA	65	77	83	27.7%	9.3%
GIZA	53	55	63	18.9%	7.1%
BENI SUEF	33	38	40	21.2%	4.5%
FAYOUM	7	10	12	71.4%	1.3%
MINYA	32	42	53	65.6%	5.9%
ASSIUT	16	18	18	12.5%	2.0%
SOHAG	13	15	20	53.8%	2.2%
QENA	40	69	84	110.0%	9.4%
ASWAN	6	29	37	516.7%	4.1%
ALEXANDRIA	18	20	20	11.1%	2.2%
CAIRO	38	41	44	15.8%	4.9%
NEW VALLEY	0	0	0	0.0%	0.0%
EL ARISH	3	3	3	0.0%	0.3%
PORT SAID	0	0	0	0.0%	0.0%
SUEZ	1	1	2	100.0%	0.2%
SOUTH SINAI	0	0	0	0.0%	0.0%
TOTAL	646	792	892	38.1%	100.0%
UPPER EGYPT	75	131	159	112.0%	17.8%
MIDDLE EGYPT	125	145	168	34.4%	18.8%
LOWER EGYPT	446	516	565	26.7%	63.3%

Source: MALR

Table 7.3.2 EGYPT: Estimated Private Sector Fertilizer Dealer Sales Per Year Based on Total Sales in 1990/91 by Governorate

IFDC Fertilizer Policy Impact Study 1993

Governorate	Number of Private Sector Licences	Total Sales of Fertilizer	Estimated Private Sector Sales	Estimated Average Sales per Licence
BEHEIRA	30	498754	289277	9643
KAFR EL SHEIK	35	224466	130190	3720
GHARBIA	75	248364	144051	1921
DAKAHILA	112	276200	160196	1430
DAMIETTA	8	42024	24374	3047
SHARKIA	50	363142	210622	4212
ISMAILIA	31	64206	37239	1201
MENOFIA	72	219184	127127	1766
KALUBIA	83	122727	71182	858
GIZA	63	127324	73848	1172
BENI SUEF	40	121685	70577	1764
FAYOUM	12	117877	68369	5697
MINYA	53	248772	144288	2722
ASSIUT	18	167206	96979	5388
SOHAG	20	136219	79007	3950
QENA	84	215890	125216	1491
ASWAN	37	84233	48855	1320
ALEXANDRIA	20	90274	52359	2618
CAIRO	44	5816	3373	77
NEW VALLEY	0	6381	3701	0
EL ARISH	3	1697	984	328
PORT SAID	0	0	0	0
SUEZ	2	0	0	0
SOUTH SINAI	0	0	0	0
TOTAL	892	3382441	1961816	2318
UPPER EGYPT	159	603548	350058	2202
MIDDLE EGYPT	168	615658	357082	2125
LOWER EGYPT	565	2163235	1254676	2416

Notes: Private Sector Sales Based on 58% market share of all products as estimated for Jul-Dec 1992
Lower Egypt average sales per license excludes Cairo, New Valley and El Arish data

Source: MALR and IFDC estimates

Table 7.3.3 EGYPT: Quantitative Assessment of Marketing Channels, December,1992.
IFDC Fertilizer Policy Impact Study 1993

Marketing Channel	Upper Egypt	Middle Egypt	Estimated Numbers Lower Egypt	Total
Private Sector				
Distributors	4	8	11	15
Wholesalers/Retailers (licensed)	140	150	500	790
Wholesalers/Retailers (unlicensed	35	40	125	200
Retailers (licensed)	19	18	65	102
Retailers (unlicensed)	875	950	3125	4950
Total Outlets	1069	1158	3815	6042

Source: IFDC estimates based on number of licensed dealers and information supplied by distributors

Table 7.3.4 EGYPT: Sources of Fertilizer Purchased by 92 Dealers January 1 - June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

	Numbers Purchasing by Source			
	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Sample Size	20	20	52	92
Factories	11	3	18	32
Distributors	13	12	43	68
EAO	11	5	4	20
Other	-	-	-	-
Total	35	20	65	120

	Percent Purchasing by Source			
Factories	55	15	34.6	34.8
Distributors	65	60	82.7	73.9
EAO	55	25	7.7	21.7
Other	-	-	-	-

Source: APCP/MALR Dealer Survey, 1992, Unpublished personal communication, R.Krenz, Chemonics,Cairo.

Table 7.3.5 EGYPT: 92 Private Sector Dealer Purchases of Fertilizer by Source
January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Source/Product	Urea	%	AN	%	SSP	%	CN	Total	Percent
Upper Egypt									
Sample No.	20								
Factories	1990	23.4%	1961	40.9%	1360	81.9%		5311	34.85%
Distributors	2880	33.9%	1000	20.9%	0	0.0%		3880	25.46%
EAO	2130	25.0%	1795	37.4%	300	18.1%		4225	27.72%
Other	1505	17.7%	40	0.8%	0	0.0%		1545	10.14%
Total	8505		4796		1660		280	15241	
Middle Egypt (1)									
Sample No.	20								
Factories	4015	35.2%	2725	32.7%	1145	39.2%		7885	34.47%
Distributors	5869	51.4%	5110	61.3%	1358	46.5%		12337	53.94%
EAO	1285	11.3%	350	4.2%	165	5.7%		1800	7.87%
Other	250	2.2%	150	1.8%	250	8.6%		650	2.84%
Total	11419		8335		2918		200	22872	
Lower Egypt (2)									
Sample No.	52								
Factories	3292	40.7%	2942	39.4%	7974	44.1%		14208	41.54%
Distributors	4140	51.1%	3600	48.2%	1005	5.6%		8745	25.57%
EAO	10	0.1%	250	3.3%	55	0.3%		315	0.92%
Other	655	8.1%	676	9.1%	9034	50.0%		10365	30.30%
Total	8097		7468		18068		572	34205	
Total Sample									
Sample No.	92								
Factories	9297	33.2%	7628	37.0%	10479	46.3%		27404	37.89%
Factory Agents	12889	46.0%	9710	47.1%	2363	10.4%		24962	34.52%
EAO	3425	12.2%	2395	11.6%	520	2.3%		6340	8.77%
Other	2410	8.6%	866	4.2%	9284	41.0%		12560	17.37%
Total	28021		20599		22646		1052	72318	

Notes: (1) Also purchased a total of 240 tons TSP not shown in Table
(2) Also purchased a total of 2,572 tons AS not shown in Table

Source: APCP/MALR Survey of Wholesalers, October 1992, Unpublished personal communication, R. Krenz, Chemonics, Cairo.

Table 7.3.6 EGYPT: Survey Responses From Dealers Purchasing Fertilizer From Factories January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Number selling fertilizer	20	20	52	92
Number buying from Factories	11	3	18	32
Percent	55	15	35	35
	(percent of merchants buying from factories)			
Name of factory				
Abu Qir	0	67	50	34
El Nasr Talkha	9	33	44	31
El Nasr Suez	0	0	33	19
Kima	36	33	0	13
Assuit	45	0	0	18
Abu Zaabal	0	33	67	41
Kafr El Zaiad	0	0	39	22
Conditions applied by Factories?				
Agreed to selling price	0	33	13	11
Agreed to sales area	0	66	6	11
Can buy from others?	91	100	94	94
Insurance deposit required	55	0	55	53
Wish to continue?	82	100	94	91
Why wish to continue?				
Prefer official source	9	27	7	11
Fixed prices	36	75	23	22
No insurance needed	9	18	5	9
Help with transport	37	18	7	12
Easy to contract	45	45	60	52
Only source available	9	0	0	3
Why do not wish to continue?				
Prices too high	18	0	0	6
Distributor takes commission	18	0	0	6

Source: APCP/MALR Survey of Wholsalers, October 1992, Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.3.7 EGYPT: Survey Responses From Dealers Purchasing Fertilizer From Distributors January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Number selling fertilizer	20	20	52	92
Number buying from Distributors	12	11	42	65
Percent	60	55	81	71
	(percent of merchants buying from distributors)			
Conditions applied by Distributors?				
Agreed to selling price	8	27	5	8
Agreed to sales area	0	18	7	8
Can buy from others?	100	100	95	97
Insurance deposit required	0	9	14	11
Other terms applied	0	0	11	8
Wish to continue?	41	100	79	75
Why wish to continue?				
Prefer official source	8	27	7	11
Fixed prices	8	75	23	22
No insurance needed	8	18	5	9
Help with transport	8	18	7	12
Easy to contract	25	45	60	52
Why do not wish to continue?				
Prices too high	42	9	17	20
Delays in delivery	17	0	5	7
Distributor takes commission	17	9	0	5
Required to accept type of fertilizer not wanted	0	0	7	7

Source: APCP/MALR Survey of Wholsalers, October 1992, Unpublished personal communication, R. Krenz, Chemonics, Cairo.

Table 7.3.8 EGYPT: Survey Responses From Dealers Purchasing Fertilizer From EAO January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Number selling fertilizer	20	20	52	92
Number buying from EAO	11	5	4	20
Percent	55	25	10	22
	(percent of merchants buying from EAO)			
Why purchased from EAO?				
Only source available	55	20	25	40
Low price	45	60	75	55
Good service	73	100	50	75
Services obtained?				
Transport	55	40	75	55
Storage	9	0	0	5
Finance	0	0	0	0
Wish to continue?	81	80	75	80
Why wish to continue?				
Prefer official source	36	20	0	25
Fixed prices	36	20	75	40
No insurance needed	0	40	25	15
Help with transport	9	0	0	5
Easy to contract	45	60	0	40
Why do not wish to continue?				
Prices too high	9	0	25	10
Delays in delivery	0	20	0	5
Required to accept type of fertilizer not wanted	9	0	0	5

Source: APCP/MALR Survey of Wholsalers, October 1992, Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.4.1 EGYPT: Estimated Distributor Costs and Margins 1992/93
IFDC Fertilizer Marketing Policy Study

Distributor Costs and Margins	Urea LE/mt	AN LE/mt	CN LE/mt	AS LE/mt	SSP LE/mt	CSP LE/mt
Ex-factory price	450.00	395.00	316.00	205.00	178.00	350.00
Distributor discount @ 2.5%	11.25	9.88	7.90	5.13	4.45	8.75
Distributor cost						
Cost ex-factory	450.00	395.00	316.00	205.00	178.00	350.00
Commercial Tax @ 2%	9.00	7.90	6.32	4.10	3.56	7.00
General Sales Tax @ 5%	22.50	19.75	15.80	10.25	8.90	17.50
Average freight cost	15.10	13.95	12.25	12.80	5.43	10.09
Total distributor cost ex-factory	496.6	436.6	350.37	232.15	195.89	384.59
Interest 1 month @ 17%	7.04	6.19	4.96	3.29	2.78	5.45
Bank Guarrantee cost 1%	0.41	0.36	0.29	0.19	0.16	0.32
Administration	0.25	0.25	0.25	0.25	0.25	0.25
Storage 1% @ LE 2.70/month	0.32	0.32	0.32	0.32	0.32	0.32
Total Costs	8.02	7.12	5.83	4.06	3.51	6.34
Profit	3.23	2.75	2.07	1.07	0.94	2.41
Profit Margin as % of purchase cost	0.6%	0.6%	0.6%	0.5%	0.5%	0.6%
Weighted Average Total Distributor Cost	371.54					
Weighted Average Distributor Profit Margin	2.26					
Average Profit Margin as % of purchase cost	0.6%					
Impact of Turnover on Return to Capital						
Total distributor income (Factory Discount)	11.25	9.88	7.90	5.13	4.45	8.75
Administration cost	0.25	0.25	0.25	0.25	0.25	0.25
Storage cost (1% @ LE 2.70/month)	0.32	0.32	0.32	0.32	0.32	0.32
Net Income before interest	10.68	9.30	7.33	4.55	3.88	8.18
Capital Employed (@Turnover 1x per month)	496.60	436.60	350.37	232.15	195.89	384.59

Return on Capital	**Wt. Average**	Urea	AN	CN	AS	SSP	CSP
@ Turnover 1x per month	25.01%	25.80%	25.56%	25.09%	23.52%	23.74%	25.51%
@ Turnover 2x per month	50.03%	51.60%	51.13%	50.18%	47.05%	47.49%	51.02%
@ Turnover 3x per month	75.04%	77.39%	76.69%	75.27%	70.57%	71.23%	76.53%
@ Turnover 4x per month	100.06%	103.19%	102.26%	100.36%	94.10%	94.98%	102.04%

Notes: Average costs and margins based on July-December 1992/93 total sales
Factory discount of 2.5% based on standard 2% discount plus estimated 0.5% volume discount
Average frieght costs based on the following rates (LE/mt):

	Urea	AN	CN	AS	SSP	CSP
Lower Egypt	11.00	11.00	12.00	12.00	5.00	5.00
Middle Egypt	16.00	16.00	17.00	17.00	6.00	16.00
Upper Egypt	22.00	22.00	23.50	23.50	7.00	22.00

Source: IFDC Estimates

Table 7.5.1 EGYPT: Estimated Build-up of Urea Prices to Private Sector Retailers 1992/93

IFDC Fertilizer Marketing Policy Study 1993

Factory	Abu Qir			Talkha		
Product	Urea			Urea		
Location	Low. Egypt	Mid.Egypt (LE/MT)	Upp.Egypt	Low. Egypt	Mid.Egypt (LE/MT)	Upp.Egypt
Ex-Factory	450.00	450.00	450.00	450.00	450.00	450.00
Commercial tax (2%)	9.00	9.00	9.00	9.00	9.00	9.00
Sales tax (5%)	22.50	22.50	22.50	22.50	22.50	22.50
Transport 1	11.00	16.00	22.00	12.00	17.00	23.00
Distributor Cost	492.50	497.50	503.50	493.50	498.50	504.50
Wholesale Cost	492.50	497.50	503.50	493.50	498.50	504.50
Wholesale Price	497.50	502.50	508.50	498.50	503.50	509.50
Retail Price 1	502.50	507.50	513.50	503.50	508.50	514.50
Transport 2	5.00	5.00	5.00	5.00	5.00	5.00
Retail Price	507.50	512.50	518.50	508.50	513.50	519.50
Range in Retail	25.15	25.60	25.75	25.20	25.45	25.75
Prices LE/50kg bag	25.65	26.10	26.25	25.70	26.05	26.25

Notes: Distributor cost shown before discounts.
Wholesale price is wholesale price to retailers
Retail price 1 is price for retail sales made by wholesalers
Retail price 2 is retail price of retailers
Transport cost 1 is included in distributors ex-factory price
Transport 2 is average transport cost from wholesalers to retailers
Cooperatives and public sector organizations are exempt from the 2% commercial tax

Source: IFDC estimates

Table 7.5.2 EGYPT: Estimated Build-up of AN Prices to Private Sector Retailers
IFDC Fertilizer Marketing Policy Study 1993

Factory	Abu Qir			Talkha		
Product	AN			AN		
Location	Low. Egypt	Mid.Egypt	Upp.Egypt	Low. Egypt	Mid.Egypt	Upp.Egypt
		(LE/MT)			(LE/MT)	
Ex-Factory	395.00	395.00	395.00	345.00	345.00	345.00
Commercial tax (2%)	7.90	7.90	7.90	6.90	6.90	6.90
Sales tax (5%)	19.75	19.75	19.75	17.25	17.25	17.25
Transport 1	11.00	16.00	22.00	12.00	17.00	23.00
Distributor Cost	433.65	438.65	444.65	381.15	386.15	392.15
Wholesale Cost	433.65	438.65	444.65	381.15	386.15	392.15
Wholesale Price	438.65	443.65	449.65	386.15	391.15	397.15
Retail Price 1	443.65	448.65	454.65	391.15	396.15	402.15
Transport 2	5.00	5.00	5.00	5.00	5.00	5.00
Retail Price	448.65	453.65	459.65	396.15	401.15	407.15
Range in Retail	22.18	22.43	22.73	19.56	19.81	20.11
Prices LE/50kg bag	22.68	22.93	23.23	20.06	20.31	20.61

Notes: Distributor cost shown before discounts.
Wholesale price is wholesale price to retailers
Retail price 1 is price for retail sales made by wholesalers
Retail price 2 is retail price of retailers
Transport cost 1 is included in distributors ex-factory price
Transport 2 is average transport cost from wholesalers to retailers
Cooperatives and public sector organizations are exempt from the 2% commercial tax
Upper range of retail bag prices based on LE 10.00/mt retail margin

Source: IFDC estimates

Table 7.5.3 EGYPT: Reported Fertilizer Prices, January-February,1993
IFDC Fertilizer Policy Impact Study 1993

Product	Factory	Location	Wholesale Price LE/50kg bag	Retail Price LE/50kg bag
Urea		Sohag Governorate		27.00
	Abu Qir			26.00
	Talkha			25.00
		Minya Governorate		
	Abu Qir		24.25	25.25
	Talkha			24.75
		Beheira Governorate		25.00
				25.50
		(Cooperative)		22.00
				25.00
	Abu Qir			25.50
		Fayoum Governorate		25.00
				25.00
				26.00
		Garbaya & Menoufia	24.45	24.75
		Giza Governorate	24.40	24.75
AN	Abu Qir	Sohag Governorate		24.50
	Talkha			22.00
	Abu Qir	Minya Governorate		21.25
	Talkha			19.75
		Beheira Governorate		21.00
				22.00
	Abu Qir			21.00
	Talkha			20.50
		Fayoum Governorate		21.00
				21.00
				21.50
		Garbaya & Menoufia	20.15	20.35
		Giza Governorate	20.50	20.75
AS		Beheira Governorate		17.50
		Garbaya & Menoufia	16.75	17.00
SSP		Sohag Governorate		10.00
		Minya Governorate		10.25
		Beheira Governorate		10.25
				10.50
		Fayoum Governorate		10.00
				11.00
CN		Fayoum Governorate		11.50
		Garbaya & Menoufia	11.00	11.25

Source: IFDC interviews with dealers and farmers

Table 7.5.4 EGYPT: Fertilizer Distributor's Sales and Prices
January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Fertilizer	Sold to	Sales MT	Percent of Sales %	Purchase Price LE/MT	Sales Price LE/MT	Margin per mt LE/MT	Margin as % on Sales %
Urea	Farmers	11750	20.9%	444.47	462.85	18.38	4.0%
	Others	44600	79.1%	440.07	460.49	20.42	4.4%
	Total	56350		440.99	460.98	19.99	4.3%
AN	Farmers	4830	12.7%	360.72	385.51	24.79	6.4%
	Others	33299	87.3%	369.79	384.27	14.48	3.8%
	Total	38129		368.64	384.43	15.79	4.1%
SSP	Farmers	4850	2.2%	184.21	196.29	12.08	6.2%
	Others	218880	97.8%	175.82	177.66	1.84	1.0%
	Total	223730		176.00	178.06	2.06	1.2%
All 3 Fertilizers	Farmers	21430	6.7%	366.69	385.09	18.40	4.8%
	Others	296779	93.3%	237.30	243.35	6.05	2.5%
	Total	318209		246.01	252.89	6.88	2.7%

Source: APCP/MALR Disributor Survey October 1992. Unpublished personal communication, R. Krenz, Chemonics, Cairo.

Table 7.5.5 EGYPT: Fertilizer Sales and Margins of Dealers
January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Location	Type of Fertilizer	Sold to	Sales MT	Percent of Sales %	Purchase Price LE/MT	Sales Price LE/MT	Margin LE/MT	Margin Return on Sales %
Upper Egypt	Urea	Farmers	6,075	82.4%	462.85	489.94	27.09	5.5%
		Others	1,300	17.6%	453.92	466.15	12.23	2.6%
Middle Egypt	Urea	Farmers	11,093	98.1%	457.07	466.28	9.21	2.0%
		Others	220	1.9%	453.64	473.18	19.54	4.1%
Lower Egypt	Urea	Farmers	6,328	81.5%	448.10	461.18	13.08	2.8%
		Others	1,435	18.5%	444.58	459.95	15.37	3.3%
Upper Egypt	AN	Farmers	3,931	84.3%	373.98	395.37	21.39	5.4%
		Others	730	15.7%	374.36	384.11	9.75	2.5%
Middle Egypt	AN	Farmers	8,003	99.4%	381.33	391.65	10.32	2.6%
		Others	50	0.6%	380.00	390.00	10.00	2.6%
Lower Egypt	AN	Farmers	6,119	90.2%	374.27	385.15	10.88	2.8%
		Others	665	9.8%	379.09	387.82	8.73	2.3%
Upper Egypt	SSP	Farmers	1,560	100.0%	185.93	197.92	11.99	6.1%
		Others	0	0.0%	0.00	0.00	0.00	0.0%
Middle Egypt	SSP	Farmers	2,301	83.6%	191.93	199.87	7.94	4.0%
		Others	450	16.4%	179.67	191.67	12.00	6.3%
Lower Egypt	SSP	Farmers	7,409	89.1%	187.54	199.15	11.61	5.8%
		Others	910	10.9%	192.43	198.68	6.25	3.1%
Total Sample	Urea	Farmers	23,496	88.8%	456.15	471.02	14.88	3.2%
		Others	2,955	11.2%	449.36	463.66	14.30	3.1%
	AN	Farmers	18,053	92.6%	377.34	390.26	12.92	3.3%
		Others	1,445	7.4%	376.73	386.02	9.29	2.4%
	SSP	Farmers	11,270	89.2%	188.21	199.13	10.91	5.5%
		Others	1,360	10.8%	188.21	196.36	8.15	4.2%
	All 3 Fertilizers	Farmers	52,819	90.2%	372.04	385.40	13.34	3.5%
		Other	5,760	9.8%	369.48	381.07	11.38	3.0%

Source: APCP/MALR Dealer Survey , October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

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Table 7.5.6 EGYPT: Farmer Fertilizer Purchases and Prices
January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

	Upper Egypt	Middle Egypt	Lower Egypt	Total/Average
Total Sample Size	82	114	303	499
Percent of farmers purchasing				
Urea	52.4	67.5	72.3	67.9
AN	89.0	76.3	67.0	72.7
SSP	57.3	59.6	87.5	76.2
AS	4.9	1.8	28.1	18.2
CN	0.0	0.0	12.2	7.4
CSP	3.7	0.0	0.7	1.0
Potassium	7.3	1.8	7.3	6.0
Percent of farmers purchasing from Private Sector				
Urea	37.2	45.5	39.3	40.4
AN	42.5	36.8	35.5	37.2
SSP	25.5	27.9	32.1	30.5
Percent of Total Purchases from Private sector				
Urea	28.3	29.4	40.4	34.9
AN	28.0	18.2	27.7	25.0
SSP	26.1	16.0	25.3	23.6
		Average Prices LE/bag by Sector		
Public Sector				
Urea Average Price	23.02	24.12	22.7	23.22
AN Average Price	19.04	19.5	20.19	19.64
SSP Average Price	9.66	9.48	10.1	9.93
Private Sector				
Urea Average Price	24.75	25.31	23.56	24.17
AN Average Price	20.43	21.51	20.25	20.58
SSP Average Price	9.81	11.02	10.33	10.32
Unweighted Averages of Public and Private Sectors				
Urea	23.51	24.47	23.05	23.55
AN	19.43	19.87	20.21	19.88
SSP	9.85	9.73	10.16	10.02
Private Sector Price Premiums as Percent of Public Sector Prices				
Urea	7.52%	4.93%	3.79%	4.09%
AN	7.30%	10.31%	0.30%	4.79%
SSP	-0.51%	16.24%	2.28%	3.93%

Source: APCP and MALR Price Survey 1992. Unpublished personal communication, R. Krenz, Chemonics, Cairo

Table 7.5.7 EGYPT: Weighted Average Retail Fertilizer Prices, 1982/83 to 1992/93

IFDC Fertilizer Policy Impact Study 1993

	LE per MT								
	Urea	AN	CAN	CN	AS	SSP	CSP	TSP	PS
1982/83	117.17	84.18	77.91	43.89	53.19	30.30		86.80	57.00
1983/84	126.80	91.20	84.50	47.70	57.90	30.30		86.80	57.00
1984/85	126.80	91.20	84.50	47.70	57.90	30.30		86.80	57.00
1985/86	131.00	91.20	84.50	47.70	57.90	30.30		86.80	57.00
1986/87	131.00	91.20	88.50	47.70	57.90	30.30	75.00	86.80	57.00
*1987/88	141.00	116.10	98.00	57.00	65.95	36.00	89.50	86.80	57.00
1988/89	263.00	141.00	98.00	84.00	127.00	71.00	188.00		57.00
1989/90	266.00	241.00	0.00	84.00	127.00	71.00	188.00		57.00
1990/91	291.00	241.00	0.00	132.00	173.00	129.00	316.00		305.00
1991/92	471.00	397.60	0.00	230.00	233.00	185.00	418.00		369.00
1992/93	500.00	425.00	0.00	241.00	360.00	190.00	390.00		380.00

	LE per kg Nitrogen					LE per kg P2O5			Weighted Average Price per kg		
									N	P2O5	K2O
1982/83	0.25	0.25	0.25	0.28	0.26	0.20	0.00	0.19	0.25	0.20	0.12
1983/84	0.28	0.27	0.27	0.31	0.28	0.20	0.00	0.19	0.28	0.20	0.12
1984/85	0.28	0.27	0.27	0.31	0.28	0.20	0.00	0.19	0.28	0.20	0.12
1985/86	0.28	0.27	0.27	0.31	0.28	0.20	0.00	0.19	0.28	0.19	0.12
1986/87	0.28	0.27	0.28	0.31	0.28	0.20	0.20	0.19	0.29	0.20	0.12
*1987/88	0.31	0.35	0.31	0.37	0.32	0.24	0.24	0.19	0.32	0.24	0.12
1988/89	0.57	0.42	0.31	0.54	0.62	0.47	0.50	0.00	0.51	0.48	0.12
1989/90	0.58	0.72	0.00	0.54	0.62	0.47	0.50	0.00	0.63	0.48	0.12
1990/91	0.63	0.72	0.00	0.85	0.84	0.86	0.84	0.00	0.69	0.86	0.64
1991/92	1.02	1.19	0.00	1.48	1.13	1.23	1.11	0.00	1.13	1.22	0.77
1992/93	1.09	1.27	0.00	1.55	1.75	1.27	1.04	0.00	1.22	1.22	0.79

* Note: Prices changed in mid-year. A simple average price for the year is assummed.

Source: PBDAC 1982/83 to 1990/91; IFDC Estimates for 1991/92 and 1992/93

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Table 7.5.8 EGYPT: Dealer Costs January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Number of Wholesaler/Retailers	20	20	52	92
Number reporting data	10	15	36	61
Number missing data	2	2	1	5
Number reporting no costs	8	3	15	26
Costs	<------------------------ LE/MT		------------------------>	
Transport	6.39	0.45	5.55	4.61
Storage	0.63	0.41	0.26	0.38
Labour	0.98	0.80	1.46	1.20
Interest	0.00	0.19	0.02	0.05
Losses	0.80	0.06	0.39	0.41
Other	0.09	0.20	1.02	0.63
Total	8.89	2.11	8.70	7.28
Total less transport	2.50	1.66	3.15	2.67

Source: APCP/MALR Dealer Survey, October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.6.1 EGYPT: Survey Results of Fertilizer Storage Facilities Controlled by Dealers, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
Sample Number	20	20	52	92
Percent of Dealers who:				
own storage	60	75	71	70
rent storage	35	30	37	37
own storage	5	10	0	3
Tons capacity/dealer	108	312	205	206
Tons sales/dealer	680	1110	450	684
Storage/Sales ratio	1:6.3	1:3.5	1:2.2	1:3.3

Source: APCP/MALR Dealer Survey, October 1992. Unpublished personal communication, R.Krenz,Chemonics,Cairo.

Table 7.6.2 EGYPT: Rankings of Main Competitors by Fertilizer Dealers January 1 to June 30,1992

IFDC Fertilizer Policy Impact Study 1993

Item		Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
1st Rank	PBDAC	11	12	17	40
	Private	7	1	27	35
	Coops	1	4	9	14
2nd Rank	PBDAC	1	2	4	7
	Private	6	3	12	21
	Coops	13	6	29	48

Source: APCP/MALR Wholesaler Survey, October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.6.3 EGYPT: Major Problems Selling Fertilizer Reported by Dealers January 1 to June 30,1992

IFDC Fertilizer Policy Impact Study 1993

Problem	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
	Percent of merchants reporting			
Lack of financing	18	20	24	23
Quality of fertilizer	18	15	20	19
Cannot deal direct with factory	14	40	13	19
Competition from coops	18	0	13	11
Transport problems	9	10	5	7

Source: APCP/MALR Wholesaler Survey, October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.6.4 EGYPT: Finance Problems of Fertilizer and Other Input Dealers January 1 to June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

Item	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
	(Percent of Dealers)			
Reporting finance problems	48	28	25	30
Additional financing needed (LE/business)	57,917	138,750	103,125	97,273
Current Source of Funds				
Private capital	68	72	84	79
Commercial banks	4	10	2	4
PBDAC	12	17	7	10
Other	4	3	2	3
Funding from PBDAC				
Loan request made	24	41	18	23
Loan recieved	12	17	11	12

Source: APCP/MALR Wholesaler Survey, October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 7.6.5 EGYPT: Dealer Responses in Relation to Further Government Action Needed to Assist Business Operations

IFDC Fertilizer Policy Impact Study 1993

Response	Upper Egypt	Middle Egypt	Lower Egypt	Total Sample
	(Percent of Wholesalers/Retailers)			
Facilitate Importing	28	24	18	21
Decrease insurance deposits	40	24	13	19
Stop increases in input prices	6	10	18	16
Facilitate credit at low interest rates	12	21	14	15
Simplify dealings with factories	12	0	18	13
Enforce licensing of dealers	12	0	15	11
Simplify obtaining permits	4	3	15	11
Punish those selling bad seed	0	17	5	7

Source: APCP/MALR Dealer Survey, October 1992. Unpublished personal communication, R. Krenz, Chemonics,Cairo.

Table 9.3.1 EGYPT: PBDAC and BDAC Storage Space @ June 30, 1992

IFDC Fertilizer Policy Impact Study 1993

All Storages SQUARE METRES

	Owned	Rented	Total
BDACs	2,257,877	1,955,640	4,213,517
PBDAC	371,714	33,901	405,615
Total	2,629,591	1,989,541	4,619,132

Source: PBDAC Privatization Office.

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Table 9.3.2 EGYPT: PBDAC and BDAC Storage Facilities for Farm Inputs @ 30 June 1992

IFDC Fertilizer Policy Impact Study 1993

	WAREHOUSES						STORES					
	Owned		Rented		Total		Owned		Rented		Total	
BDACs	No	Sq. Meter	No	Sq. Meter	No	Sq. Meter	No	Sq. Meter	No.	Sq. Meter	No	Sq. Meter
Beheira	10	27000	3	3000	13	30000	4	2870	11	18119	15	20989
Kafr El Sh.					0	0	57	59500	37	14484	94	73984
Garbia	7	12045	2	2872	9	14917	7	4336	11	5042	18	9378
Daqualia	6	8000			6	8000	22	63294	23	10987	45	74281
Sharkaya	11	17072			11	17072	6	5062	17	4809	23	9871
Ismailia	4	4000	1	1000	5	5000			1	150	1	150
Demyut	1	2000			1	2000	3	4000	3	182	6	4182
Manoufia	1	12600			1	12600	26	108661	19	79792	45	188453
Qalyubia	3	3000	2	3250	5	6250			2	320	2	320
Giza	1	2808			1	2808	10	5288	4	835	14	7123
Fayoum	7	8125			7	8125			6	1820	6	1820
Beni. Suef	5	11260			5	11260	6	3040	4	353	10	3393
Minya	3	18895			3	18895	27	19968	4	874	31	20842
Assiut	4	4000			4	4000	13	7460	24	6830	37	14290
Sohag	3	2900			3	2900	45	17583			46	17583
Qena	11	23020			11	23020	5	868	11	6382	16	7250
Aswan	2	12400			2	12400	1	49	4	1162	5	1211
PBDAC												
Sub total	80	169125	8	10032	88	179157	233	292969	181	152141	414	445110
PBDAC	2	3055			2	3055	42	5236	28	4353	70	9590
TOTAL	82	172180	8	10032	90	182212	275	298205	209	156494	484	454699

	SHEDS						SHOUNAS					
	Owned		Rented		Total		Owned		Rented		Total	
BDACs	No.	Sq. Meter	No.	Sq. Meter	No.	Sq. Meter	No.	Sq. Meter	No.	Sq. Meter	No.	Sq. Meter
Beheira	11	18100	8	6500	19	24600	16	163360	26	156390	42	319750
Kafr El Sh.	6	1480	7	3826	13	5306	21	182634	13	81624	34	264258
Garbia	16	14928	12	8620	28	23548	21	155833	25	128183	46	284016
Daqualia	12	4270	16	5375	28	9645	21	132626	26	166071	47	298697
Sharkaya	9	4818	15	4970	24	9788	27	230943	29	206899	56	437842
Ismailia	4	1920	6	2980	10	4800	2	5580	7	29620	9	35200
Demyut	7	5050	6	3640	13	8690	6	58803	4	26230	10	85033
Manoufia	16	7140	3	1342	21	8482	23	29084	14	24941	37	54025
Qalyubia	8	3700	7	3500	15	7200	6	46325	9	62705	15	109030
Giza	12	5690	4	1860	16	7550	5	39929	15	87916	20	128844
Fayoum	6	1625	4	3279	10	4904	8	109128	16	99028	24	208156
Beni. Suef	6	5640	3	2340	11	6960	13	123750	13	223648	26	347398
Minya	16	3657	7	1620	23	5277	24	239517	38	79490	62	319007
Assiut	4	800	11	2230	15	3030	14	105105	18	159168	32	264273
Sohag	7	3841	15	7362	22	11203	5	14894	17	119773	22	134667
Qena	5	3164	13	6081	18	9245	10	65050	10	64491	20	129541
Aswan	6	1800			5	1800	1	6600	4	11865	5	18465
PBDAC												
Sub total	154	87523	137	65425	291	153048	223	1708160	284	1728042	507	3436202
PBDAC	11	10724	1	400	12	11124	27	352669	11	29148	38	381817
TOTAL	165	98247	138	65825	303	164172	250	2060829	295	1757190	545	3818019

Source: PBDAC

Table 9.3.3 EGYPT: Use of PBDAC and 15 BDAC Storages January, 1993

IFDC Ferilizer Policy Impact Study 1993

Area — SQUARE METERS

Currently Available (Empty)	Rented Out	PBDAC Use (Current)	Total
2,420,043	113,739	590,988	3,124,770
Percent of Total Area			
77.5	3.5	19.0	100.0

Source: PBDAC. Only 15 BDACs responded to a PBDAC survey.

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Table 9.4.1 EGYPT: PBDAC Interest Rates on Deposit Accounts

IFDC Fertilizer Policy Impact Study 1993

Type of Deposit	Interest Rate 1992 %	New Rates from 15/3/93 %
15-30 Days	7.50	13.00
31-90 Days	12.00	14.25
91-180 Days	16.00	14.25
6 months to 1 Year	16.25	14.50
1 year to 2 Years	16.50	14.50
2 Years to 3 Years	16.50	15.00
3 Years to 5 Years	17.00	15.50
5 Years to 7 Years	17.50	15.50
Over 7 Years	18.00	-
Regular Savings Accounts	13.50	13.50
Special Coupon Accounts	17.00 & 17.50	15.00 & 15.50

Source: PBDAC

Table 9.4.2 EGYPT: PBDAC Total Deposits @ June 30,1992

IFDC Fertilizer Policy Impact Study 1993

LE MILLIONS

Type of Deposit	1991	1992
Current Accounts	427.7	395.3
Fixed Time Accounts	494.2	640.0
Certificates of Deposit	43.6	146.5
Savings	569.7	596.4
Other	81.7	87.6
Totals	1613.9	1865.8

Source: PBDAC

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Table 9.4.3 EGYPT: PBDAC Loans, Borrowing and Equity

IFDC Fertilizer Policy Impact Study 1993

(LE MILLIONS)

Fiscal Year	(1) Total Deposits	(2) Total Loans	(3) Inter-Bank Borrowing	(4) PBDAC Equity	Ratio A	Ratio B
1988/89	1,137	3,117	1,443	424	2.74	0.46
1989/90	1,442	3,717	1,372	537	2.61	0.37
1990/91	1,692	3,936	1,614	598	2.33	0.41
1991/92	1,866	3,907	1,628	715	2.09	0.41

Notes: Ratio "A" is the ratio of total deposits to total loans.
Ratio "B" is the ratio of borrowing to total loans.

Source: PBDAC

Table 11.2.1 EGYPT: Recommended Nutrient Requirements, By Crop 1988/89

IFDC Fertilizer Policy Impact Study 1993

Crop	Nitrogen (N) (kg/fd)	Phosphorus (P2O5) (kg/fd)
Winter Crops		
Wheat	70.0	15.0
Barley	46.5	-
Beans	15.5	30.0
Berseem	-	15.0
Winter Onions	93 - 155	15.0
Flax	46.5	15.0
Winter Vegetables	85.0	22.5
Potatoes	124.0	67.5
Fruit	70.0	30.0
Sugarcane	31.0	15.0
Garlic	93.0	45.0
Lentils	15.5	15.0
Summer Crops		
Cotton (Delta)	62.0	15.0
Cotton (Upper Egypt)	70.0	15.0
Rice	39.0	15.0
Sugarcane	232.0	60.0
Rice	60.0	15.0
Maize	93.0	-
Sorghum	70.0	-
Soybeans	77.0	22.5
Peanuts	31.0	30.0
Summer Vegetables	93.0	30.0
Nili Vegetables	85.0	30.0
Onions	93 - 155	15.0
Fruit	70.0	-
Berseem	-	30.0

Source: MALR

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Table 11.2.2 EGYPT: PBDAC Determined & Extra Quota of N, P, and K Fertilizer for Crops on Newly Reclaimed Sandy Soils

IFDC Fertilizer Policy Impact Study 1993

	Recommended Amounts (kg/Fd.)			Extra Quantities (kg/Fd.)		
	N	P2O5	K2O	N	P2O5	K2O
CROP	15.5%	15%	48%	15.5%	15%	48%
A. Field Crops						
Vegetables						
Wheat	455	100		50	100	50
Barley	300			100	100	50
Lentil,Chick Peas	100	150		100	50	50
Beans,Peas, Lunpins	100	150	50	100	50	50
Onion, Garlic	1000	300			100	50
Cucurbits	350	150	50	150	50	100
Berseem	100	300		100	100	100
Sesame	200	150		150	50	50
Groundnuts	200	200		50	100	50
Maize	600	100		50	100	
Sunflower	300	100		100	50	50
Eggplants,Peppers	700	150	50	50	50	50
Tomatoes,Potatoes	800	300	100	200	100	50
B. Fruit Trees						
Citrus 1-3 yrs old	300	150	50	100	50	50
Citrus 4-6 yrs old	450	200	50	50	100	50
Citrus 7-10 yrs old	900	200	50	50	100	50
Citrus over 10 yrs	1200	200	50	100	50	50
Apples, Pears						
1-3 yrs old	150	150	50	100	50	50
3-6 yrs old	400	200	50	100	100	50
over 6 yrs old	600	200	50	100	100	50
Apricot						
1-3 yrs old	300	150	50	100	50	50
Peaches over 3 yrs	600	300	50	100	100	50
Grapes under 3 yrs	250	200	50	100	50	50
Grapes over 3 yrs	650	300	50	150	100	50
Mangos 1-3 yrs old	150	150	50	100	50	50
3-6 yrs old	500	200	50	100	100	50
7-10 yrs old	700	200	50	150	100	50

Source: PBDAC

Table 12.1 Egypt: Area of Wheat

IFDC Fertilizer Policy Impact Study 1993

Year	Total	Traditional Varieties (1)		New Varieties (2)	
		Area	Percent	Area	Percent
1980	1326179	904416	68	421763	32
1981	1399595	785370	56	614225	44
1982	1373613	655470	48	718143	52
1983	1320045	591158	45	728887	55
1984	1178372	558428	47	619944	53
1985	1185923	571783	48	614140	52
1986	1206346	503687	42	702659	58
1987	1373009	525132	38	847877	62
1988	1421719	499932	35	921787	65
1989	1532534	520501	34	1012033	66
1990	1775737	515169	29	1260568	71
1991	1958223	331934	17	1626289	83

(1) Traditional varieties include Giza 155, Giza 156, Balady and others
(2) New varieties include Giza 157, Sakha 8, 61, 62, 69, 92, Giza 162, 163 and stork and stork

Source: MALR, Department of Statistics. Unpublished data

Table 12.2. Egypt: Area of Rice
IFDC Fertilizer Policy Impact Study 1993

Year	Total	Traditional Varieties (1)		New Varieties (2)	
		Area	Percent	Area	Percent
1980	970096	91324	9	878772	91
1981	954142	35839	4	918303	96
1982	1023956	69152	7	954804	93
1983	1011266	66028	7	954238	94
1984	983458	42416	4	941042	96
1985	923971	17437	2	906534	98
1986	1007794	8692	1	999102	99
1987	981060	8771	1	972289	99
1988	837050	8521	1	826529	99
1989	982495	10997	1	971498	99
1990	1036345	7839	1	1028506	99
1991	1099659	12338	1	1087321	99

(1) Traditional varieties include Japanese, Giza 159 and others
(2) New varieties include Giza 171, 172, 181, 179, 176, Philippine and Reho

Source: MALR, Department of Statistics. Unpublished data

rice

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Table 12.3 Egypt: Area of Summer Maize
IFDC Fertilizer Policy Impact Study 1993

Year	Total	Traditional Varieties (1)		New Varieties (2)	
		Area	Percent	Area	Percent
1980	1432727	1247517	87	185210	13
1981	1434341	1253117	87	181224	13
1982	1451846	1206399	83	245447	17
1983	1396630	1013500	73	383130	27
1984	1449037	896095	62	552942	38
1985	1396150	848958	61	547192	39
1986	1122129	530062	47	592067	53
1987	1352730	603839	45	748891	55
1988	1480018	536597	36	943821	64
1989	1533911	410355	27	1123556	73
1990	1547406	405663	26	1141743	74
1991	1675262	491187	29	1184075	71

(1) Traditional varieties include balady and other varieties
(2) New varieties include hybrid and Americane

Source: MALR, Department of Statistics. Unpublished data maize

Table 12.4 EGYPT: Regression Estimates by Using Semi-log Equation
Ln Fi = a + cT of Fertilizer Nutrients (1979/80 - 1990/91)

IFDC Fertilizer Policy Impact Study 1993

EQUATION			R Squared	Growth Rate
Ln N	=	13.196 + 0.042 T (0.075) (0.006)	0.82	4.26
Ln P2O5	=	11.611 + 0.053 T (0.116) (0.010)	0.75	5.44
Ln K2O	=	9.122 + 0.108 T (0.264) (0.022)	0.66	11.01
Ln (N + P2O5 + K2O)	=	13.397 + 0.045 T (0.077) (0.006)	0.83	4.59

Notes: Ln = Natural logarithm
N,P2O5 and K2O = Annual Consumption of N,P2O5 and K2O in MT
Figures in parentheses are standard errors.
Growth Rate = annual growth rate.
T = Time, 1, 2, ...12

Data Source: Derived from PBDAC Data

Table 12.5 EGYPT: Regression Estimates by Using the Equation
Ln Fi = a + b in (Pi/Po) + cT of Fertilizer Nutrients (1979/80 - 1990/91)

IFDC Fertilizer Policy Impact Study 1993

EQUATION			R Squared	Growth Rate
Ln N	=	13.333 - 0.025 Ln Pn + 0.04 T	0.82	4.08
		(0.014) (0.164) (0.013)		
Ln P2O5	=	13.214 - 0.314 Ln Pp + 0.038 T	0.89	3.90
		(0.083) (0.095) (0.008)		
Ln K2O	=	9.734 - 0.131 Ln Pk + 0.097 T	0.72	10.14
		(0.271) (0.189) (0.028)		
Ln (N + P2O5 + K2O)	=	14.127 - 0.136 Ln P + 0.036 T	0.85	3.69
		(0.077) (0.138) (0.011)		

Notes: Ln = Natural logarithm
N,P2O5 and K2O = Annual Consumption of N,P2O5 and K2O in MT
(N+P2O5+K2O) = Annual Consumption of (N+P2O5+K2O) in MT
Pn = price of nitrogen per MT deflated by agricultural price index
Pp = price of P2O5 per MT deflated by agricultural price index
Pk = price of K2O per MT deflated by agricultural price index
P = weighted average price of a nutrient MT deflated by agricultural price index
Figures in parentheses are standard errors.
Growth Rate = annual growth rate.
T = Time, 1, 2, ...12

Data Source: Derived from PBDAC and CAPMS Data

Table 12.6 EGYPT: Growth Rates of N, P2O5 and K2O Consumption By Using Exponential Functional Form

IFDC Fertilizer Policy Impact Study 1993

Time Period	1970-91	1975-91	1980-91
N	5.09	4.97	4.26
P2O5	9.44	7.85	5.44
K2O	17.56	17.04	11.37
N + P2O5 + K2O	5.83	5.57	4.59

Data Source: Derived from PBDAC Data

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Table 12.7 Egypt: Consumption Of Fertilizer

IFDC Fertilizer Policy Impact Study 1993

MT

Year	N	P2O5	K2O	NPK
1969/70	323,485	39,900	1,824	365,209
1970/71	336,970	47,100	1,584	385,654
1971/72	354,640	37,350	2,016	394,006
1972/73	373,550	27,600	1,824	402,974
1973/74	388,120	51,150	1,872	441,142
1974/75	409,510	48,900	2,976	461,386
1975/76	426,715	62,850	2,688	492,253
1976/77	459,110	88,350	3,552	551,012
1977/78	475,850	97,500	5,520	578,870
1978/79	498,790	96,600	5,520	600,910
1979/80	484,024	96,822	11,616	592,462
1980/81	594,339	111,182	8,640	714,161
1981/82	631,711	132,613	11,426	775,750
1982/83	660,385	144,118	9,589	814,092
1983/84	746,326	160,725	17,472	924,523
1984/85	640,931	164,841	24,243	830,015
1985/86	778,663	183,663	24,368	986,694
1986/87	777,037	185,407	28,887	991,331
1987/88	791,526	190,886	29,492	1,011,904
1988/89	790,388	180,290	27,035	997,713
1989/90	834,297	170,069	21,189	1,025,555
1990/91	841,177	186,806	27,715	1,055,698

Source: Derived from PBDAC Data

regcons

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Table 12.8 Egypt: Consumption Projection By Growth Rate Of Log Equaton

IFDC Fertilizer Policy Impact Study 1993

MT

Year	N	P2O5	K2O	NPK
1992	874,824	193,961	30,392	1,093,893
1993	909,817	201,389	33,328	1,133,470
1994	946,210	209,103	36,548	1,174,479
1995	984,058	217,111	40,078	1,216,972
1996	1,023,420	225,427	43,950	1,261,002
1997	1,064,357	234,060	48,195	1,306,625
1998	1,106,932	243,025	52,851	1,353,899
1999	1,151,209	252,333	57,956	1,402,883
2000	1,197,257	261,997	63,555	1,453,639

Source: Calculated From table 12.5 demand

Table 12.9 Egypt: Consumption Projection By Growth rate of Log Equation Including Intercept and Price Terms

IFDC Fertilizer Policy Impact Study 1993

MT

Year	N	P2O5	K2O	NPK
1992	915,140	199,719	34,524	1,114,820
1993	952,475	207,518	38,025	1,155,892
1994	991,335	215,622	41,880	1,198,476
1995	1,031,779	224,042	46,126	1,242,630
1996	1,073,874	232,791	50,803	1,288,410
1997	1,117,686	241,882	55,953	1,335,876
1998	1,163,285	251,328	61,626	1,385,092
1999	1,210,745	261,142	67,874	1,436,120
2000	1,260,141	271,340	74,756	1,489,029

Source: Calculated From Table 12.5

regcons

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Table 12.10 Egypt: Consumption Projection By Exponenial Equation

IFDC Fertilizer Policy Impact Studay 1993

MT

Year	N	P2O5	K2O	NPK
1992	925,284	219,675	37,111	1,179,873
1993	964,668	231,622	41.331	1,234,062
1994	1,005,729	244,219	46,030	1,290,739
1995	1,048,538	257,501	51,264	1,350,020
1996	1,093,169	271,506	57,093	1,412,023
1997	1,139,699	286,272	63,584	1,476,873
1998	1,188,210	301,842	70,814	1,544,702
1999	1,238,786	318,258	78,866	1,615,647
2000	1,291,515	335,567	87,833	1,689,849

Source: Calculated From Table 12.4 regcons

Table 12.11 Egypt: Average Nutrient Consumption by Region, 1983-84 to 1987-88

IFDC Fertilizer Policy Impact Study 1993

Region	N	Pct	P2O5	Pct	K2O	Pct	Total	Pct
Upper Egypt	166,881.00	(22.4)	33,005.00	(17.8)	10,063.00	(30.9)	209,949.00	(22.0)
	(79.5)		(15.7)		(4.8)		(100)	
Middle Egypt	182,782.00	(24.5)	39,913.00	(22.5)	3,842.00	(15.1)	226,537.00	(33.8)
	(80.7)		(17.6)		(1.7)		(100)	
Lower Egypt	396,069.00	(53.1)	105,591.00	(59.7)	15,060.00	(54.0)	516,720.00	(54.2)
	(76.7)		(20.4)		(2.9)		(100)	
TOTAL	**745,732.00**	**(100)**	**178,509.00**	**(100)**	**28,965.00**	**(100)**	**953,206.00**	**(100)**

Note: Figures in parentheses are percentages

Source: Calculated from PBDAC Data

Table 12.12 EGYPT: Nutrient Use by Region, 1985-86

IFDC Fertilizer Policy Impact Study 1993

kg/Feddan

Region	N	P2O5	K2O
Upper Egypt	113.0	22.2	5.3
Middle Egypt	80.9	17.7	1.6
Lower Egypt	54.6	14.5	1.6

Source: Calculated From PBDAC and MALR data.

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Table 12.13 Egypt: Fertilizer Use Recommendations
IFDC Fertilizer Policy Impact Study 1993

Crop	Recommended Rates: KG N/FD			Percent Increase	
	1975-76	1984-85	1990-91	1975-67 to 1984/85	1984/85 to 1990-91
Wheat	49.41	69.80	120.00	41.27	71.92
Beans	7.82	15.50		98.21	
Cotton	50.42	62.00		22.97	
Sugarcane	108.53	232.50		114.23	
Maize	62.02	93.00	132.00	49.95	41.94
Rice		46.00	69.00		50.00
Sorghum	57.73	69.80		20.91	

Source: Untill 1984/85 From Table 11, p 32 of Bremer-Fax etal. April 1987
For 1990/91 ARC

fertrec

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Table 13.3.1 EGYPT: Total Monthly PBDAC Sales by Product 1990/91

IFDC Fertilizer Policy Impact Study 1993

TOTAL EGYPT

(Product Metric tons)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	106412	113674	22320	48526	52610	9124	9098
August	69496	44165	17102	23308	28208	1820	5030
September	38927	39178	13018	10289	34406	1599	3239
October	30615	33139	8263	9378	62625	3303	2165
November	67021	62581	26236	13172	172599	11243	4068
December	87200	73242	18953	26008	169142	12609	4713
January	60689	62271	20105	25778	73857	6909	3470
February	55157	80205	24238	31393	101122	7628	4615
March	51258	70507	24848	29643	81569	6548	6473
April	43664	52092	20194	45647	78270	6511	4074
May	71952	87261	26006	75794	99039	8088	5617
June	75511	93670	23058	63176	73582	5957	5178
TOTAL	757902	811984	244342	402111	1027029	81338	57740

(monthly percent)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	14.0%	14.0%	9.1%	12.1%	5.1%	11.2%	15.8%
August	9.2%	5.4%	7.0%	5.8%	2.7%	2.2%	8.7%
September	5.1%	4.8%	5.3%	2.6%	3.4%	2.0%	5.6%
October	4.0%	4.1%	3.4%	2.3%	6.1%	4.1%	3.8%
November	8.8%	7.7%	10.7%	3.3%	16.8%	13.8%	7.0%
December	11.5%	9.0%	7.8%	6.5%	16.5%	15.5%	8.2%
January	8.0%	7.7%	8.2%	6.4%	7.2%	8.5%	6.0%
February	7.3%	9.9%	9.9%	7.8%	9.8%	9.4%	8.0%
March	6.8%	8.7%	10.2%	7.4%	7.9%	8.0%	11.2%
April	5.8%	6.4%	8.3%	11.4%	7.6%	8.0%	7.1%
May	9.5%	10.7%	10.6%	18.8%	9.6%	9.9%	9.7%
June	10.0%	11.5%	9.4%	15.7%	7.2%	7.3%	9.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: PBDAC

Table 13.3.2 EGYPT: Monthly PBDAC Sales by Product 1990/91 in Upper Egypt

IFDC Fertilizer Policy Impact Study 1993

UPPER EGYPT

(Product Metric tons)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	30808	60551	0	0	14023	5139	5953
August	16905	10009	0	0	1592	129	475
September	7535	10753	0	0	1161	63	711
October	5572	6774	0	0	9873	389	521
November	12105	14418	0	0	28465	2029	782
December	18361	27217	0	0	25485	3283	1261
January	15059	20574	0	0	7856	2292	557
February	11744	29424	0	0	8680	1042	824
March	11838	12878	0	219	9047	972	791
April	10484	10901	0	675	6812	1088	480
May	19989	17770	4	1947	9211	1149	1147
June	33567	21717	30	1023	6357	1323	1738
TOTAL	193967	242986	34	3864	128562	18899	15240

(monthly percent)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	15.9%	24.9%	0.0%	0.0%	10.9%	27.2%	39.1%
August	8.7%	4.1%	0.0%	0.0%	1.2%	0.7%	3.1%
September	3.9%	4.4%	0.0%	0.0%	0.9%	0.3%	4.7%
October	2.9%	2.8%	0.0%	0.0%	7.7%	2.1%	3.4%
November	6.2%	5.9%	0.0%	0.0%	22.1%	10.7%	5.1%
December	9.5%	11.2%	0.0%	0.0%	19.8%	17.4%	8.3%
January	7.8%	8.5%	0.0%	0.0%	6.1%	12.1%	3.7%
February	6.1%	12.1%	0.0%	0.0%	6.8%	5.5%	5.4%
March	6.1%	5.3%	0.0%	5.7%	7.0%	5.1%	5.2%
April	5.4%	4.5%	0.0%	17.5%	5.3%	5.8%	3.1%
May	10.3%	7.3%	11.8%	50.4%	7.2%	6.1%	7.5%
June	17.3%	8.9%	88.2%	26.5%	4.9%	7.0%	11.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: PBDAC

Table 13.3.3 EGYPT: Monthly PBDAC Sales by Product 1990/91 in Middle Egypt

IFDC Fertilizer Policy Impact Study 1993

MIDDLE EGYPT

			(Product Metric tons)				
MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	25000	12976	1247	993	7179	318	661
August	26117	11210	4461	863	4697	314	745
September	17680	15652	6318	873	7292	336	418
October	11288	9441	973	1132	18403	888	598
November	18418	13097	2593	1839	39067	2383	481
December	21562	12236	4588	395	34075	1650	868
January	13072	8017	1354	520	11273	551	368
February	12607	17067	3948	1672	15903	941	870
March	11738	11134	1322	854	13435	748	641
April	9718	8939	2470	1153	8817	398	356
May	19371	18419	4288	3155	14589	726	464
June	16119	16818	5059	1592	12508	822	437
TOTAL	202689	155007	38621	15042	187318	10075	6906
			(monthly percent)				
July	12.3%	8.4%	3.2%	6.6%	3.8%	3.2%	9.6%
August	12.9%	7.2%	11.6%	5.7%	2.5%	3.1%	10.8%
September	8.7%	10.1%	16.4%	5.8%	3.9%	3.3%	6.1%
October	5.6%	6.1%	2.5%	7.5%	9.8%	8.8%	8.7%
November	9.1%	8.4%	6.7%	12.2%	20.9%	23.7%	7.0%
December	10.6%	7.9%	11.9%	2.6%	18.2%	16.4%	12.6%
January	6.4%	5.2%	3.5%	3.5%	6.0%	5.5%	5.3%
February	6.2%	11.0%	10.2%	11.1%	8.5%	9.3%	12.6%
March	5.8%	7.2%	3.4%	5.7%	7.2%	7.4%	9.3%
April	4.8%	5.8%	6.4%	7.7%	4.7%	3.9%	5.2%
May	9.6%	11.9%	11.1%	21.0%	7.8%	7.2%	6.7%
June	8.0%	10.8%	13.1%	10.6%	6.7%	8.2%	6.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: PBDAC

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Table 13.3.4 EGYPT: Monthly PBDAC Sales by Product 1990/91 in Lower Egypt

IFDC Fertilizer Policy Impact Study 1993

LOWER EGYPT

(Product Metric tons)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	50604	40147	21073	47533	31408	3667	2485
August	26475	22946	12641	22444	21919	1378	3811
September	13712	12773	6700	9416	25953	1199	2110
October	13755	16924	7291	8246	34349	2026	1047
November	36498	35057	23643	11332	105067	6832	2805
December	47277	33789	14365	25613	109582	7676	2583
January	32557	33680	18751	25258	54728	4066	2545
February	30806	33714	20290	29721	76539	5645	2920
March	27681	46494	23526	28569	59087	4827	5041
April	23461	32251	17724	43820	62642	5025	3239
May	32593	51072	21714	70692	75239	6212	4006
June	25826	55135	17968	60561	54637	3812	3003
TOTAL	361246	413991	205687	383205	711149	52364	35594

(monthly percent)

MONTH	UREA	AN	CN	AS	SSP	CSP	POT SUL
July	14.0%	9.7%	10.2%	12.4%	4.4%	7.0%	7.0%
August	7.3%	5.5%	6.1%	5.9%	3.1%	2.6%	10.7%
September	3.8%	3.1%	3.3%	2.5%	3.6%	2.3%	5.9%
October	3.8%	4.1%	3.5%	2.2%	4.8%	3.9%	2.9%
November	10.1%	8.5%	11.5%	3.0%	14.8%	13.0%	7.9%
December	13.1%	8.2%	7.0%	6.7%	15.4%	14.7%	7.3%
January	9.0%	8.1%	9.1%	6.6%	7.7%	7.8%	7.2%
February	8.5%	8.1%	9.9%	7.8%	10.8%	10.8%	8.2%
March	7.7%	11.2%	11.4%	7.5%	8.3%	9.2%	14.2%
April	6.5%	7.8%	8.6%	11.4%	8.8%	9.6%	9.1%
May	9.0%	12.3%	10.6%	18.4%	10.6%	11.9%	11.3%
June	7.1%	13.3%	8.7%	15.8%	7.7%	7.3%	8.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: PBDAC

Table 13.3.5 EGYPT: Factory Liftings July - December 1992 Compared to Liftings in 1991/92

IFDC Fertilizer Policy Impact Study 1993

	1990/91	1991/92	6 months 1992/93	July-Dec as % of 1991/92 Liftings
Abu Qir Urea	462000	462000	194080	42.0%
El Nasr Urea	400000	270000	141963	52.6%
Total Urea	862000	732000	336043	45.9%
Abu Qir AN	0	420000	348015	82.9%
El Nasr AN	260000	130000	98769	76.0%
Coke AN	49000	60000	19081	31.8%
Kima AN	270000	262000	140185	53.5%
Total AN	579000	872000	606050	69.5%
El Nasr CN	220000	208000	48173	23.2%
El Nasr AS	50000	50000	16918	33.8%
Coke AS	13200	12000	5839	48.7%
Total AS	63200	62000	22757	36.7%
Abu Zaabal SSP	220000	185000	146198	79.0%
Kafr El Za. SSP	720000	660000	333960	50.6%
Total SSP	940000	845000	480158	56.8%
Abu Zaabal CSP	34000	52000	4079	7.8%
CSP				
Total N	637604	673852	369761	54.9%
Total P2O5	153750	146250	73553	50.3%

Note: In addition to factory liftings PBDAC sold out of stock during the period July-December 1992 a total of 13000 mt N and 13000 mt P2O5.

Source: CIC

Table 14.1.1 EGYPT: Projections of Supply Demand Balance, 1992/93 to 2000
IFDC Fertilizer Policy Impact Study 1993

Supply Potential

Product	Source	1993	1994	1995	1996	19997	1998	1999	2000
Urea	Abu Qir	470	470	470	470	470	470	470	470
	El Nasr	460	460	460	460	460	460	460	460
	Total	930	930	930	930	930	930	930	930
AN	Abu Qir	750	750	750	750	750	750	750	750
	El Nasr(T)	265	265	265	265	265	265	265	265
	El Nasr(S)	0	330	330	330	330	330	330	330
	El Nasr(C)	59	59	59	59	59	59	59	59
	Kima	264	264	264	264	264	264	264	264
	Total	1338	1668	1668	1668	1668	1668	1668	1668
CN	El Nasr(S)	230	230	230	230	230	230	230	230
AS	El Nasr(S)	50	50	50	50	50	50	50	50
	El Nasr(C)	12	12	12	12	12	12	12	12
	Total	62	62	62	62	62	62	62	62
SSP	Abu Zaabal	325	325	325	325	325	325	325	325
	Kafr E.Z.	730	730	730	730	730	730	730	730
	Total	1055	1055	1055	1055	1055	1055	1055	1055
CSP	Abu Zaabal	120	120	120	120	120	120	120	120
Nitrogen	Total	924	1035	1035	1035	1035	1035	1035	1035
Phosphorus	Total	203	203	203	203	203	203	203	203
Potential Demand									
Nitrogen	Total	952	991	1031	1073	1117	1163	1210	1260
Phosphorus	Total	207	216	224	233	242	251	261	271
Potassium	Total	38	42	46	51	56	62	68	75
Export/(Import) Variance									
Nitrogen	Total	-27.55	44.00	4.00	-38.00	-82.00	-128.00	-175.00	-225.00
Phosphorus	Total	-4	-13	-21	-30	-39	-48	-58	-68
Potassium	Total	-38	-42	-46	-51	-56	-62	-68	-75

Figure 7.1 EGYPT: Fertilizer Distribution System January, 1993

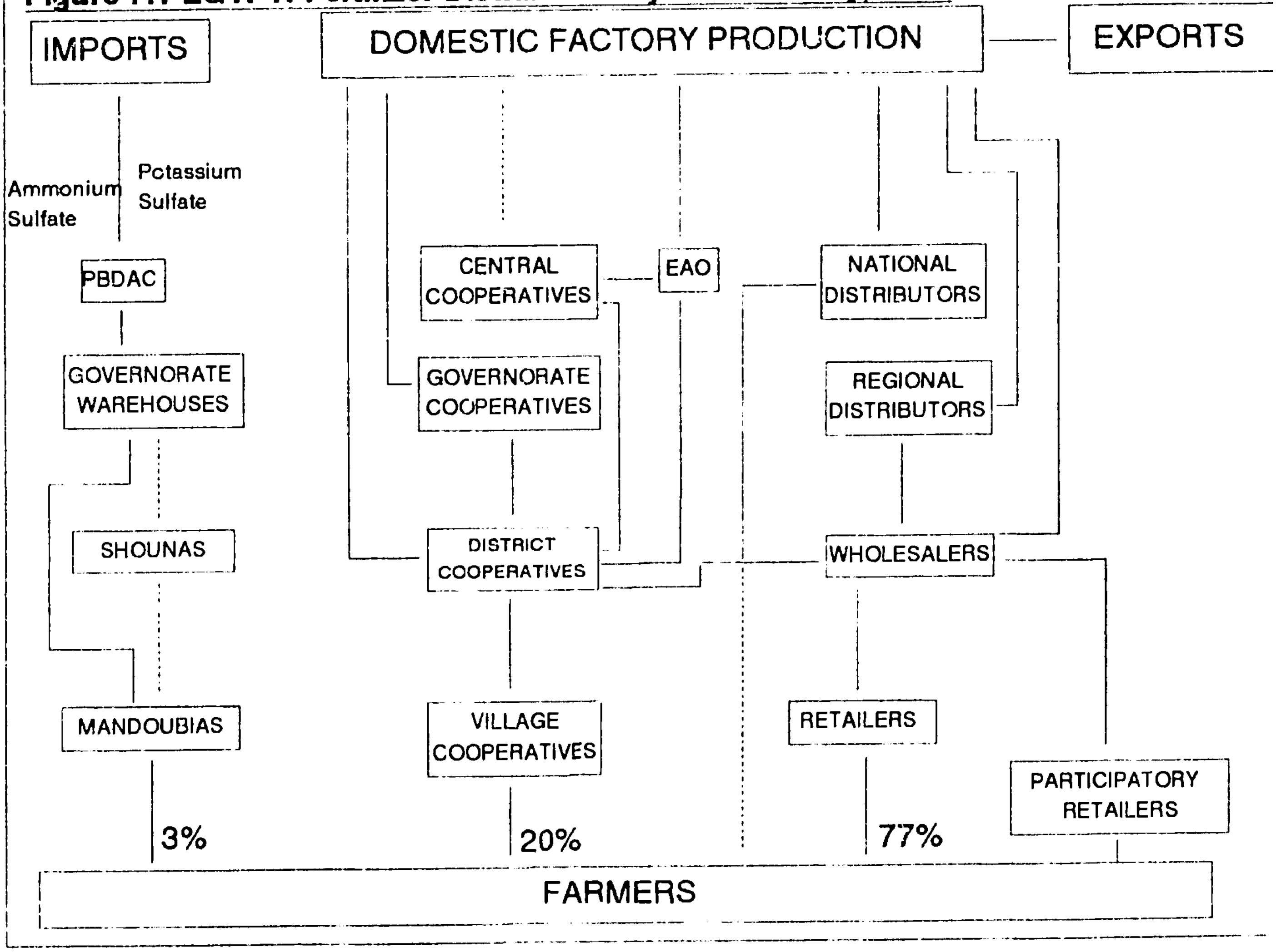

Figure 9.3.1 PBDAC and BDAC's Storage Facilities, June 1992

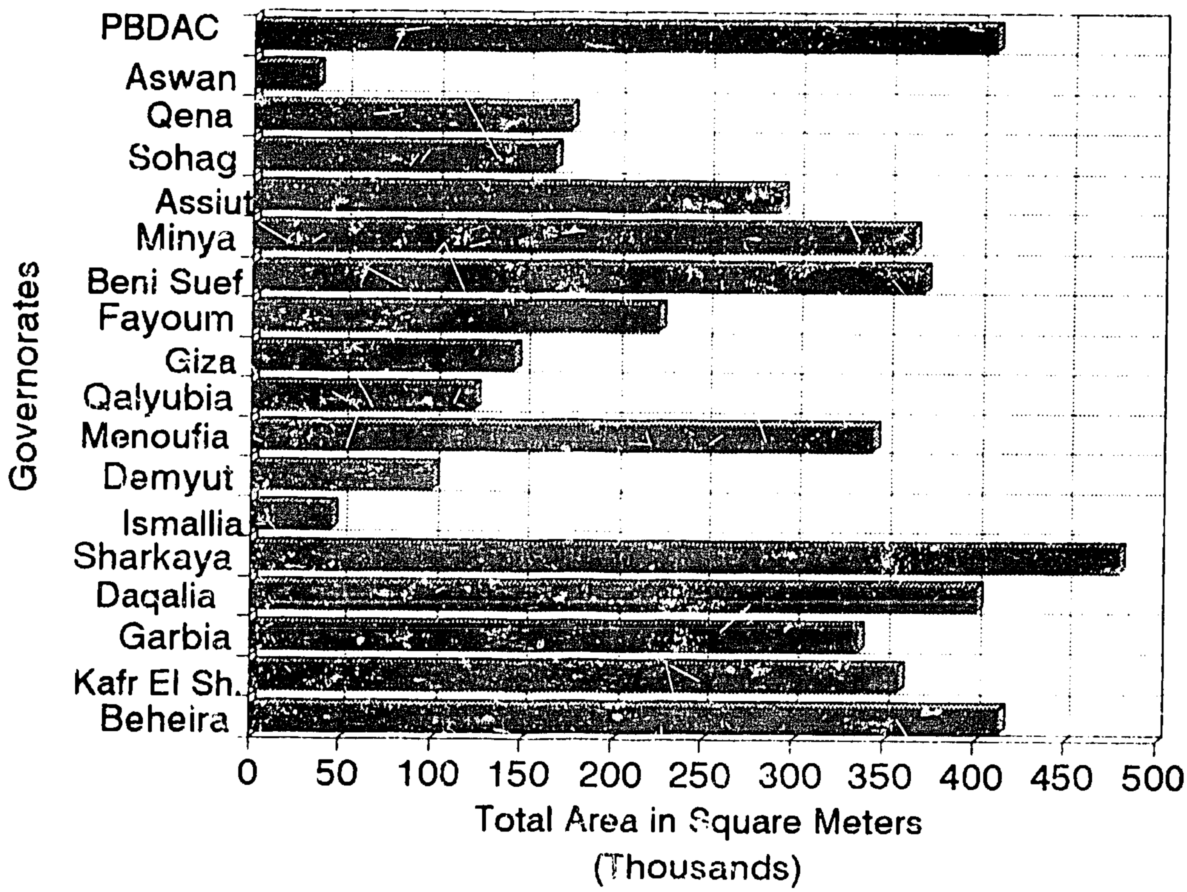

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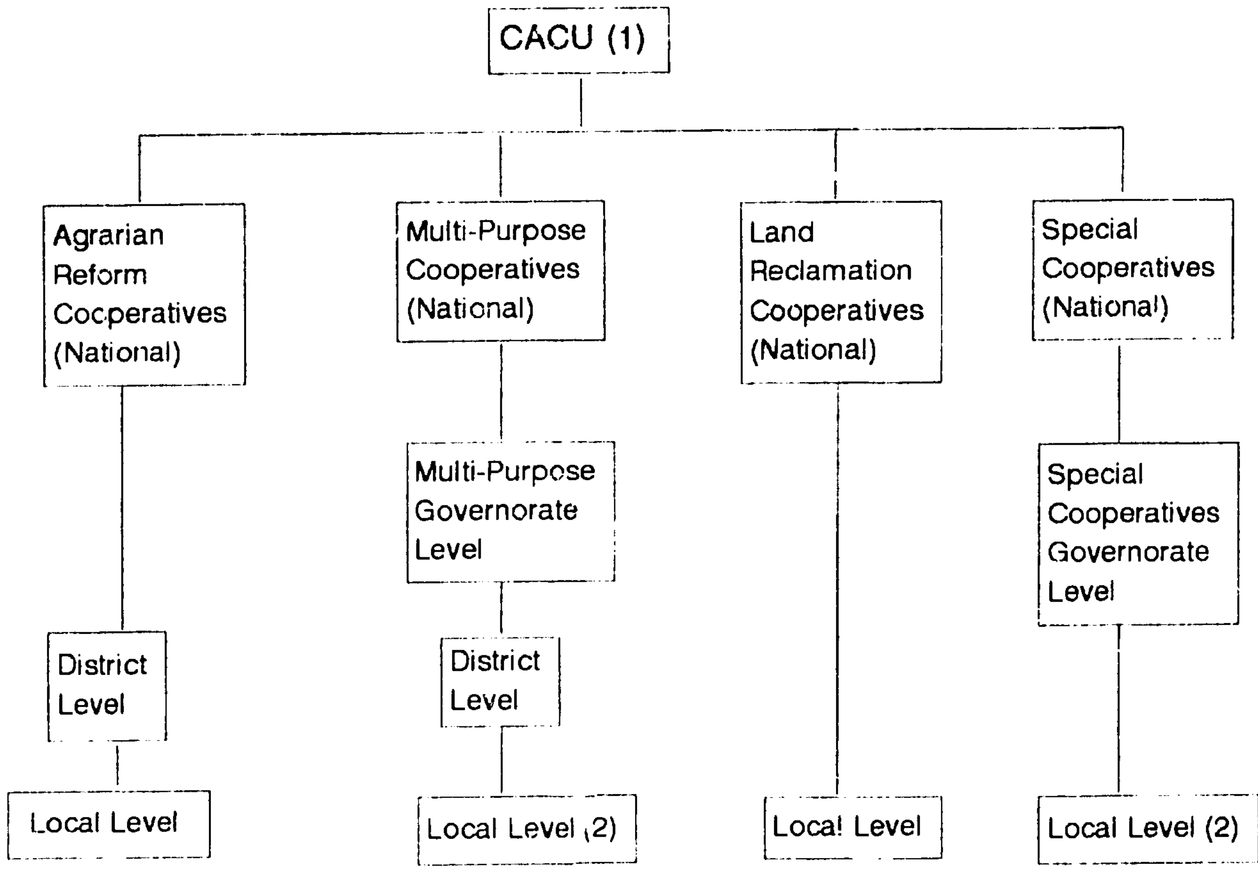
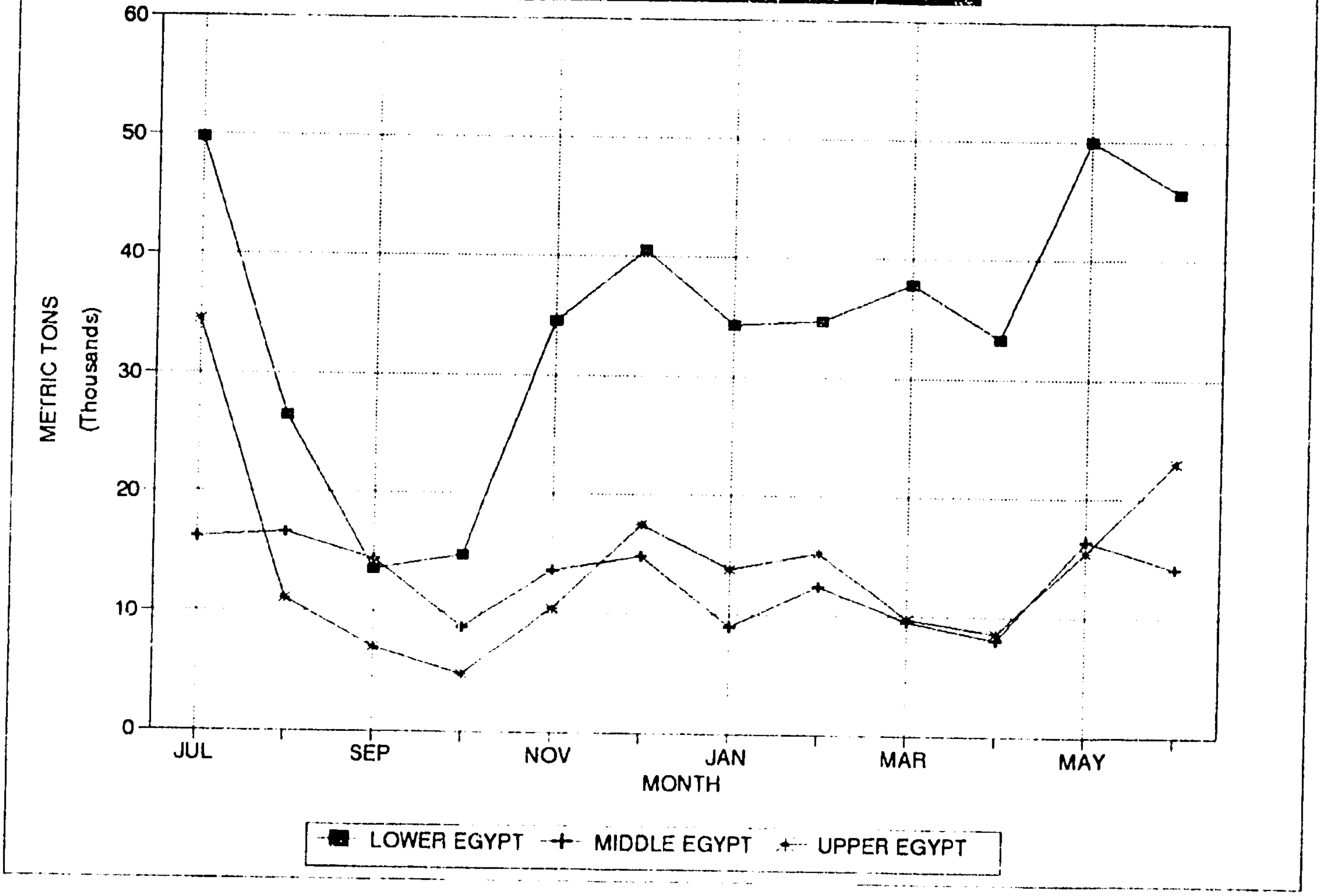
Figure 10.1 EGYPT: Structure and Type of Agricultural Cooperatives



1. Central Agricultural Cooperative Union (Apex)
2. Not all Governorates have Governorate level Multi-Purpose Cooperatives.
3. In some instances, the local level Multi-Purpose and Special Cooperatives are the same.

Figure 13.3.1 EGYPT Monthly Nitrogen Sales by Region, 1990/91



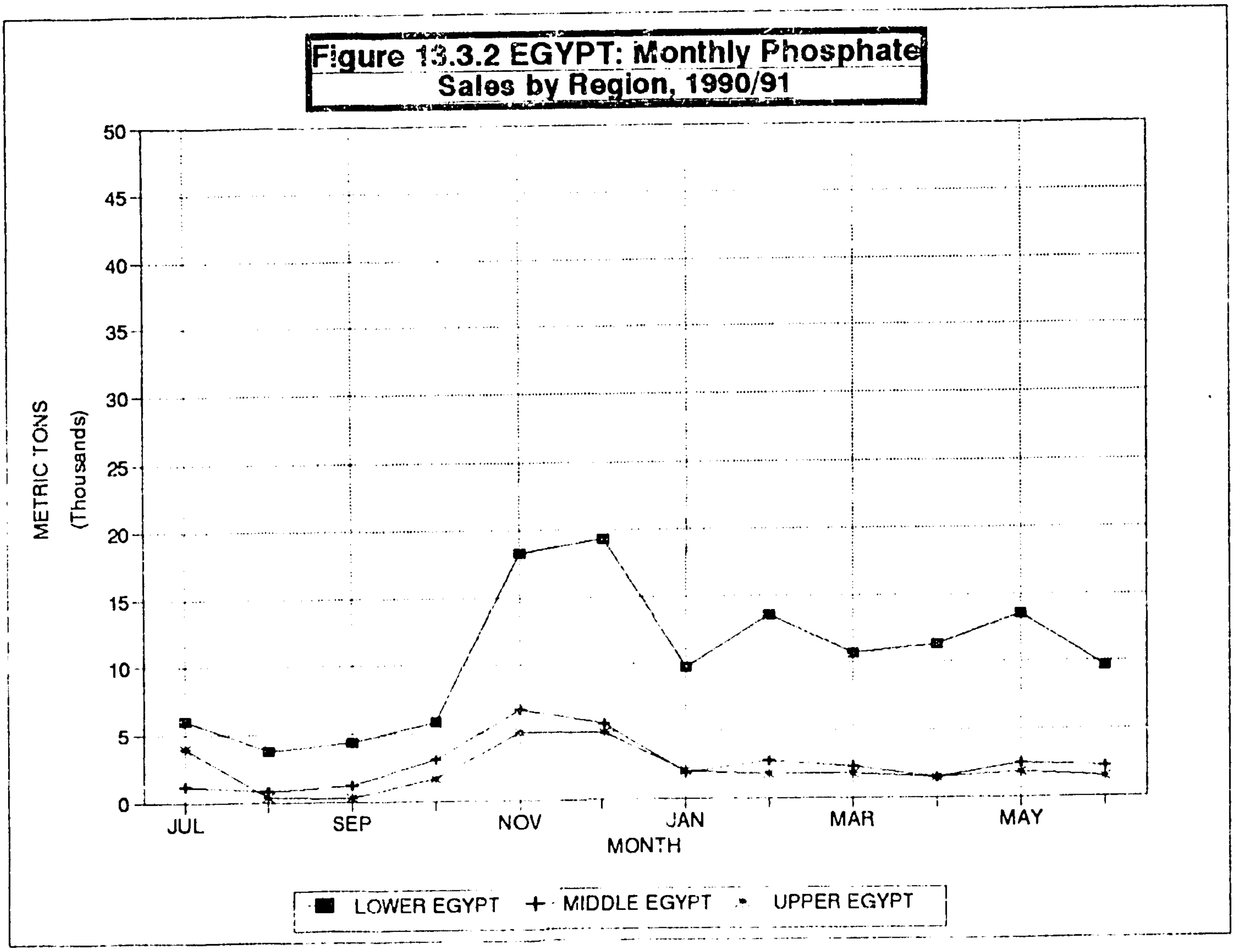


Figure 13.3.2 EGYPT: Monthly Phosphate Sales by Region, 1990/91
METRIC TONS (Thousands)
50
45
40
35
30
25
20
15
10
5
0
JUL
SEP
NOV
JAN
MAR
MAY
MONTH
LOWER EGYPT
MIDDLE EGYPT
UPPER EGYPT

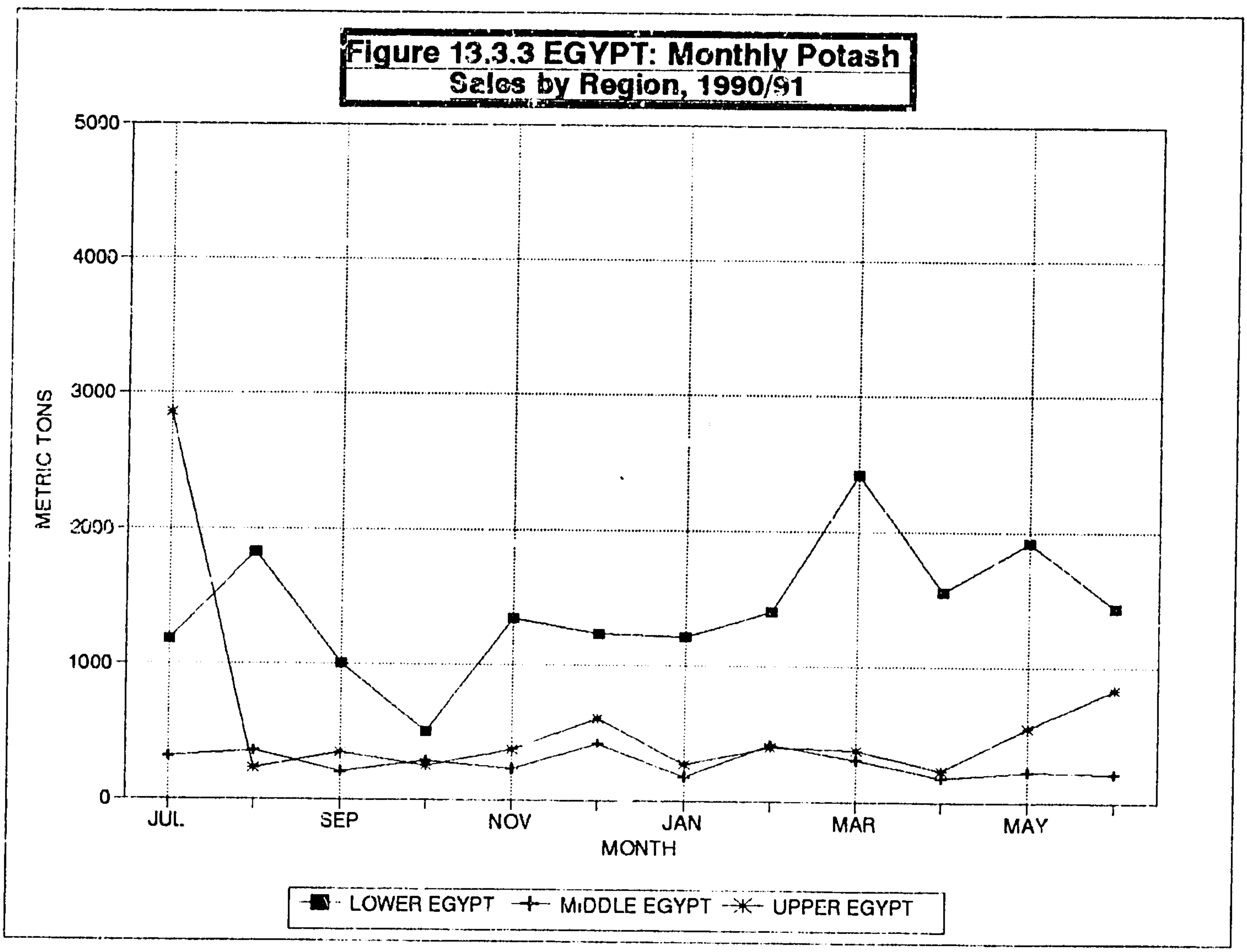


Figure 13.3.3 EGYPT: Monthly Potash
Sales by Region, 1990/91
5000
4000
3000
2000
1000
0
METRIC TONS
JUL
SEP
NOV
JAN
MAR
MAY
MONTH
LOWER EGYPT
MIDDLE EGYPT
UPPER EGYPT

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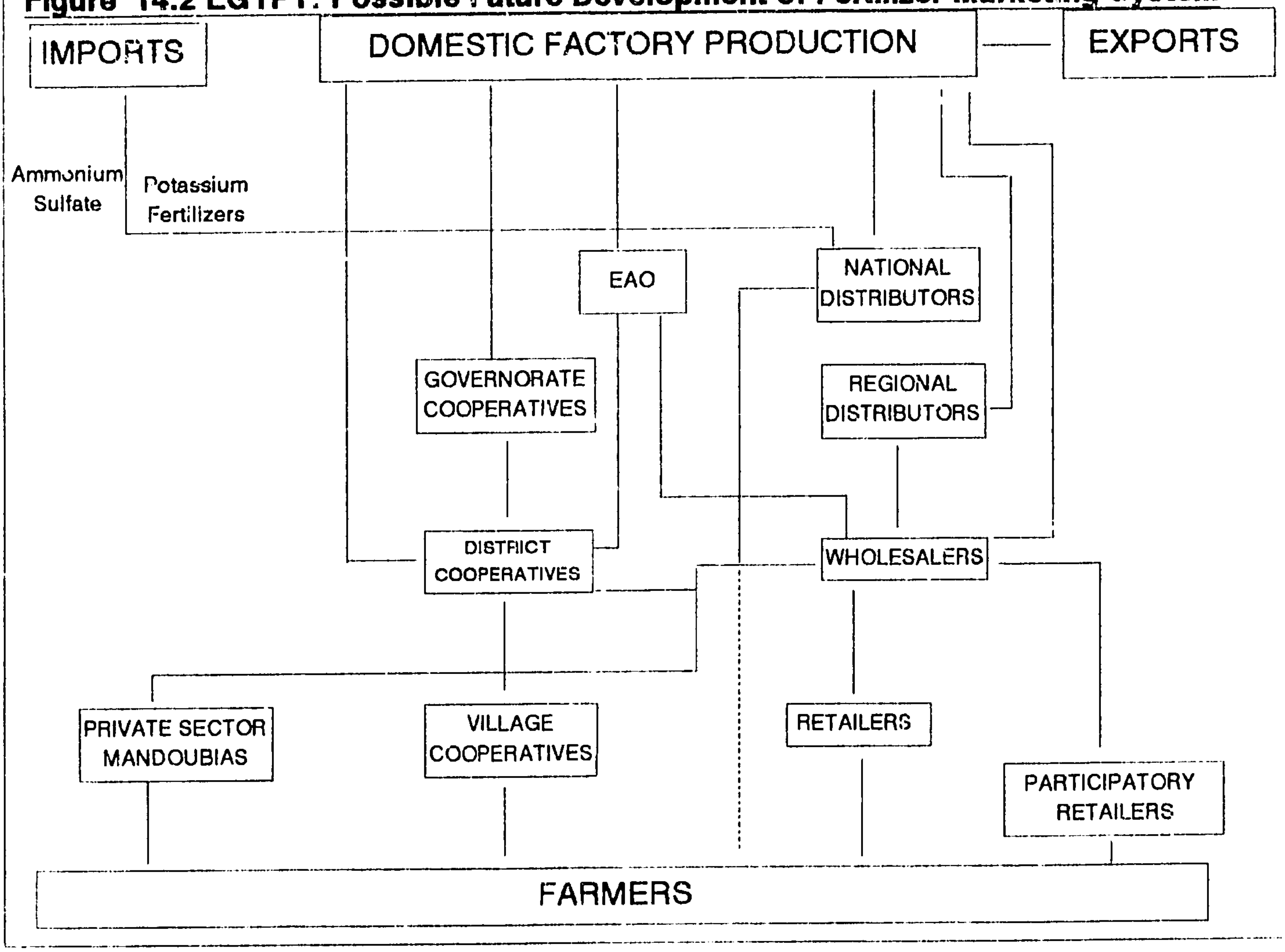
Figure 14.2 EGYPT: Possible Future Development of Fertilizer Marketing System



STATISTICAL ANNEX

Annex Table 4.1 Egypt: Index Number of Prices
IFDC Fertilizer Policy Impact Study 1993

year	General Wholesale Price Index	Agricultural Price Index	Consumer Price Index
	1965/66 = 100	1965/66=100	1966/67 = 10
1970	114.6	117.6	113.5
1971	119.1	116.9	117.9
1972	120.5	129.4	117.6
1973	128.8	146.3	131.2
1974	147.2	172.8	149.6
1975	158.3	178.7	167.9
1976	170.7	205.0	187.8
1977	186.6	240.6	206.7
1978	214.1	245.2	234.2
1979	234.6	292.7	248.7
1980	285.2	342.4	311.0
1981	308.9	372.3	353.4
1982	337.7	402.9	452.8
1983	391.1	498.7	499.8
1984	430.9	561.1	545.4
1985	487.8	657.7	609.2
1986	572.1	827.4	747.8
1987	650.2	876.1	848.1
1988	820.9	1023.3	1032.3
1989	1044.9	1421.9	1265.3
1990	1220.3	1581.7	1478.7
1991	1439.0	1844.4	1721.5

Source: CAPMS

indxp

Annex Table 4.6.1 Egypt: Areas, Production and yields of Wheat 1979/80-1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	556,995	1,736,440	3.12
1980/81	587,830	1,938,327	3.30
1981/82	576,917	2,016,992	3.50
1982/83	554,500	1,996,000	3.60
1983/84	495,034	1,815,176	3.67
1984/85	498,000	1,872,000	3.76
A. Average(80 to 85)	544,879	1,895,823	3.49
1985/86	507,000	1,928,000	3.80
1986/87	577,000	2,721,000	4.72
1987/88	597,350	2,838,000	4.75
1988/89	643,980	3,182,000	4.94
1989/90	821,301	4,268,049	5.20
1990/91	930,702	4,482,523	4.82
B.Average(86 to 91)	679,556	3,236,595	4.70
Change (A to B)	24.72%	70.72%	34.81%
Change Average (80/81 to 90/91)	53.04%	138.13%	56.09%
Growth rate	3.66%	8.65%	4.82%
Contribution	44.00%	-	56.00%

Source: Derived from MALR Data

whtarea

Annex Table 4.6.2 Egypt: Areas, Production and Yields of Broad Beans 1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	102,793	212,672	2.07
1980/81	99,847	207,855	2.08
1981/82	115,118	259,629	2.26
1982/83	137,000	295,000	2.15
1983/84	129,000	271,000	2.10
1984/85	142,400	302,000	2.12
A. Average(80 to 85)	121,026	258,026	2.13
1985/86	128,965	448,000	3.47
1986/87	136,110	499,000	3.67
1987/88	152,490	362,000	2.37
1988/89	154,590	460,000	2.98
1989/90	144,925	451,000	3.11
1990/91	122,888	307,131	2.50
B.Average(86 to 91)	139,995	421,189	3.02
Change (A to B)	15.67%	63.23%	41.62%
Change Average (80/81 to 90/91)	32.16%	80.28%	35.19%
Growth rate	2.83%	6.60%	3.66%
Contribution	44.00%	-	56.00%

Source: Derived from MALR Data

beanarea

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Annex Table 4.6.3 Egypt: Areas, Production and Yields of Rice
1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	408,374	2,382,100	5.83
1980/81	401,685	2,236,362	5.57
1981/82	430,758	2,440,513	5.67
1982/83	423,000	2,442,000	5.77
1983/84	413,711	2,236,436	5.41
1984/85	388,600	2,311,300	5.95
A. Average(80 to 85)	411,021	2,341,452	5.70
1985/86	423,400	2,445,000	5.77
1986/87	412,940	2,279,000	5.52
1987/88	351,600	2,132,000	6.06
1988/89	412,940	2,679,000	6.49
1989/90	435,908	3,167,421	7.27
1990/91	433,000	3,152,000	7.28
B.Average(86 to 91)	411,631	2,642,404	6.40
Change (A to B)	0.15%	12.85%	12.28%
Change Average (80/81 to 90/91)	7.26%	36.83%	27.59%
Growth rate	0.08%	2.23%	2.14%
Contribution	4.00%	-	96.00%

Source: Derived from MALR Data

ricearea

Annex Table 4.6.4 Egypt: Areas, Production and yields of Cotton 1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	522,701	1,408,267	2.69
1980/81	494,936	1,325,835	2.68
1981/82	447,738	1,210,850	2.70
1982/83	420,000	1,069,000	2.55
1983/84	413,000	1,049,000	2.54
1984/85	454,000	1,191,000	2.62
A. Average(80 to 85)	458,729	1,208,992	2.63
1985/86	443,180	1,120,000	2.53
1986/87	411,680	981,000	2.38
1987/88	425,960	882,000	2.07
1983/89	426,800	820,000	1.92
1989/90	417,247	838,000	2.01
1990/91	358,859	760,000	2.12
B.Average(86 to 91)	413,954	900,167	2.17
Change (A to B)	-9.76%	-25.54%	-17.47%
Change Average (80/81 to 90/91)	-23.73%	-41.55%	-23.20%
Growth rate	-2.07%	-5.07%	-3.06%
Contribution	40.00%	-	60.00%

Source: Derived from MALR Data

Annex Table 4.6.5 Egypt: Areas, Production and Yields of Maize
1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	800,440	3,231,075	4.04
1980/81	808,009	3,307,640	4.09
1981/82	812,832	3,347,293	4.12
1982/83	820,000	3,509,000	4.28
1983/84	830,000	3,698,000	4.46
1984/85	804,000	3,699,000	4.60
A. Average(80 to 85)	812,547	3,465,335	4.26
1985/86	623,000	3,608,000	5.79
1986/87	760,765	3,619,000	4.76
1987/88	823,357	4,088,000	4 97
1988/89	841,840	4,529,000	5.38
1989/90	830,174	4,798,635	5.78
1990/91	911,000	5,270,000	5.78
B.Average(86 to 91)	798,356	4,318,773	5.41
Change (A to B)	-1.75%	24.63%	26.87%
Change Average (80/81 to 90/91)	8.25%	53.98%	42.25%
Growth rate	0.50%	4.11%	3.60%
Contribution	12.00%	-	88.00%

Source: Derived from MALR Data

maizaroa

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Annex Table 4.6.6 Egypt: Areas, Production and Yields of Sugarcane 1979/80 - 1990/91

IFDC fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	106,072	8,618,000	81.25
1980/81	105,393	8,805,000	83.54
1981/82	106,879	8,740,000	81.77
1982/83	105,000	8,424,000	80.23
1983/84	102,500	8,633,000	84.22
1984/85	105,043	9,249,000	88.05
A. Average(80 to 85)	105,148	8,744,833	83.18
1985/86	109,939	9,684,000	88.09
1986/87	112,475	10,565,274	93.93
1987/88	115,605	10,795,000	93.38
1988/89	115,520	11,213,000	97.07
1989/90	117,620	11,143,000	94.74
1990/91	110,583	11,095,209	100.33
B.Average(86 to 91)	113,624	10,749,247	94.59
Change (A to B)	8.06%	22.92%	13.72%
Change Average (80/81 to 90/91)	7.92%	27.64%	18.37%
Growth rate	0.98%	3.03%	2.03%
Contribution	33.00%	-	67.00%

Source: Derived from MALR Data

sugarea

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Annex Table 4.6.7 Egypt: Areas, Production and Yields of Tomatoes 1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	129,322	2,467,793	19.08
1980/81	136,388	2,453,525	17.99
1981/82	135,134	2,657,045	19.66
1982/83	136,100	2,862,000	21.03
1983/84	134,845	2,993,000	22.20
1984/85	144,930	3,576,000	24.67
A. Average(80 to 85)	136,120	2,834,894	20.77
1985/86	165,510	4,455,939	26.92
1986/87	168,450	4,921,000	29.21
1987/88	168,872	4,212,000	24.94
1988/89	178,534	3,997,000	22.39
1989/90	155,873	4,233,842	27.16
1990/91	137,760	3,896,000	28.28
B.Average(86 to 91)	162,500	4,285,964	26.48
Change (A to B)	19.38%	51.19%	27.50%
Change Average (80/81 to 90/91)	10.51%	65.20%	49.56%
Growth rate	2.02%	5.91%	3.82%
Contribution	34.00%	-	66.00%

Source: Derived from MALR Data

tomarea

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Annex Table 4.6.8 Egypt: Areas, Production and Yields of Potatoes 1979/80 - 1990/91

IFDC Fertilizer Policy Impact Study 1993

Year	Area Harvested (ha)	Production (MT)	Yield (MT/ha)
1979/80	70,254	1,213,887	17.28
1980/81	66,907	1,194,870	17.86
1981/82	64,000	1,184,000	18.50
1982/83	57,550	1,095,000	19.03
1983/84	62,170	1,189,000	19.12
1984/85	74,350	1,478,229	19.88
A. Average(80 to 85)	65,872	1,225,831	18.61
1985/86	73,090	1,430,760	19.58
1986/87	79,820	1,800,748	22.56
1987/88	86,960	1,862,012	21.41
1988/89	73,930	1,657,000	22.41
1989/90	79,663	1,637,807	20.56
1990/91	43,600	920,000	21.10
B.Average(86 to 91)	72,844	1,551,388	21.27
Change (A to B)	10.58%	26.56%	14.28%
Change Average (80/81 to 90/91)	-10.13%	6.19%	18.56%
Growth rate	0.05%	2.12%	2.08%
Contribution	2.00%	-	98.00%

Source : MALR

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Annex Table 4.6.9 Egypt: Total Cultivated & Crops Area
1979/1980 - 1991/1992

IFDC Fertilizer Policy Impact Study 1993

(000 FD)

Year	Cultivated Area	Crop Area	Intensty
1979/80	5,878	10,982	1.87
1980/81	5,833	11,089	1.90
1981/82	5,850	11,207	1.92
1982/83	5,828	11,250	1.93
1983/84	5,992	11,190	1.87
1984/85	5,983	11,175	1.87
1985/86	6,001	11,137	1.86
1986/87	5,972	11,127	1.86
1987/88	6,102	11,235	1.84
1988/89	6,120	11,339	1.85
1989/90	6,303	11,527	1.83
1990/91	6,291	11,637	1.85
1991/92	6,200	11,827	1.91

Source: Derived from MALR Data

Annex Table 12.1 EGYPT: Total Fertilizer Sales 1982/83 to 1992/93

IFDC Fertilizer Policy Impact Study 1993

PRODUCT:	UREA	A.N.	C.A.N.	C.N.	A.S.	SSP	CSP	TSP	SUL.POT.
ANALYSIS	46%N	33%N	31%N	15.5%N	20.6%N	15%P2O5	37.5%P2O	46%P2O5	48%K?O
PRODUCT METRIC TONS									
1982/83	808,621	82,099	601,137	255,739	154,942	573,920	0	126,152	19,978
1983/84	991,144	81,803	615,057	270,575	132,590	733,841	0	110,106	36,400
1984/85	738,751	112,018	588,069	223,570	212,061	862,037	0	77,251	50,306
1985/86	897,983	227,203	577,274	208,853	365,363	1,070,534	31,916	24,162	50,767
1986/87	923,336	156,180	583,016	223,158	396,808	989,586	94,747	3,129	60,181
1987/88	960,290	224,955	528,237	246,903	351,499	1,012,118	102,952	1,003	61,442
1988/89	838,591	895,860	0	230,070	334,284	951,128	100,321	0	56,322
1989/90	950,842	871,419	0	246,575	324,104	968,579	66,085	0	44,143
1990/91	974,902	811,984	0	244,337	402,111	1,042,029	81,338	0	57,740
1991/92	747,252	1,017,988	6,000	188,488	289,306	748,338	33,811	0	43,837
6 months 1992/93	372,844	693,462	0	83,804	82,804	447,254	26,463	0	22,229
PRODUCT MIX PERCENT	<.......... Percent of Total Nitrogen				......>	< ..... Percent of Total P2O5		......>	
1982/83	56.3%	4.2%	28.2%	6.0%	4.8%	59.7%	0.0%	40.3%	100.0%
1983/84	61.1%	3.7%	25.5%	5.6%	3.7%	68.5%	0.0%	31.5%	100.0%
1984/85	53.0%	5.9%	28.4%	5.4%	6.8%	78.4%	0.0%	21.6%	100.0%
1985/86	53.0%	9.8%	23.0%	4.2%	9.7%	87.4%	6.5%	6.1%	100.0%
1986/87	54.7%	6.7%	23.3%	4.5%	10.5%	80.1%	19.2%	0.8%	100.0%
1987/88	55.6%	9.5%	20.6%	4.8%	9.1%	79.5%	20.2%	0.2%	100.0%
1988/89	48.6%	38.0%	0.0%	4.5%	8.7%	79.1%	20.9%	0.0%	100.0%
1989/90	52.4%	35.0%	0.0%	4.6%	8.0%	85.4%	14.6%	0.0%	100.0%
1990/91	53.3%	32.3%	0.0%	4.5%	9.8%	83.7%	16.3%	0.0%	100.0%
1991/92	44.3%	44.0%	0.2%	3.8%	7.7%	89.9%	10.1%	0.0%	100.0%
6 months 1992/93	39.5%	53.5%	0.0%	3.0%	3.9%	87.1%	12.9%	0.0%	100.0%
Average 82/83 - 86/87	871967	131861	592911	236379	252353	845984	25333	68160	43566
Average 87/88 - 91/92	894375	764441	106247	231275	340261	944438	76901	201	52697
Average 82/83 - 86/87	55.7%	6.1%	25.9%	5.1%	7.2%	75.6%	5.7%	6.1%	100.0%
Average 87/88 - 91/92	51.0%	31.7%	4.2%	4.4%	8.7%	83.0%	16.9%	0.0%	100.0%
6 months 1992/93	39.5%	53.5%	0.0%	3.0%	3.9%	87.1%	12.9%	0.0%	100.0%

	NUTRIENTS			
	N	P2O5	K2O	TOTAL
1982/83	660,385	144,118	9,589	814092
1983/84	746,326	160,725	17,472	924523
1984/85	640,931	164,841	24,243	830015
1985/86	778,663	183,663	24,368	986695
1986/87	777,037	185,407	28,887	991331
1987/88	794,167	190,886	29,492	1014545
1988/89	790,388	180,290	27,035	997712
1989/90	834,297	170,069	21,189	1025555
1990/91	841,177	186,806	27,715	1055698
1991/92	775,465	124,930	21,042	921436
6 months 1992/93	433,865	77,012	10,670	521547
Average 82/83 - 86/87	720,668	167,751	20,912	909331
Average 87/88 - 91/92	807,099	170,596	25,294	1002989

Annex Table 12.2 EGYPT: Total Nitrogen Sales by Governorate, 1983/84 to 1991/92

IFDC Fertilizer Policy impact Study 1993

(mt Nitrogen)

GOVERNORATE	1983-4	1984-5	1985-6	1986-7	1987-8	1988-9	1989-90	1990-1	1991-2
Behaira	94,901	94,709	102,124	108,400	101,292	108,859	108458	95,474	45,793
Kafr El Sheik	35,451	34,646	43,759	41,905	43,982	44,467	44680	44,532	29,901
Gharbia	46,452	39,538	47,154	45,196	47,339	48,402	48775	44,000	23,528
Dakahlia	57,515	45,056	61,507	56,029	58,179	59,250	58188	54,574	29,880
Damietta	8,163	7,551	8,403	8,723	7,693	8,093	8291	7,348	4,767
Sharkia	69,722	66,197	71,876	73,787	76,330	78,451	76290	69,905	37,669
Ismailia	9,011	10,873	14,834	14,900	16,411	14,578	13927	13,258	5,669
Menofia	48,854	44,634	51,462	49,829	54,629	50,766	47955	42,383	18,364
Kalubia	28,162	24,922	27,418	26,835	27,352	27,685	27200	23,053	10,095
Giza	31,000	26,208	31,409	34,206	36,631	31,252	32636	31,153	13,683
Beni Suef	36,663	18,942	32,135	29,653	33.140	31,642	32704	32,523	18,425
Fayoum	36,087	29,974	35,865	35,435	37,613	34,715	37370	32,439	15,772
Minya	63,595	47,748	58,707	58,750	60,940	61,196	61306	58,134	33.157
Assiut	45,774	31,633	39,591	44,396	39,752	43,049	41761	42,231	26,622
Sohag	42,973	25,812	44,281	38,169	38,630	38,671	40483	38,174	25,827
Qana	62,318	61,226	68,391	70,336	69,989	68,758	70472	67,859	50,467
Aswan	19,710	19,223	23,784	24,754	23,665	22,511	24569	23,162	20,760
Alexandria	7,793	7,971	9,565	12,777	14,654	15,004	17136	17,792	8,343
Cairo	761	790	846	947	1,128	1,156	1110	1,126	461
New Valley	1,134	1,094	1,283	1,455	1,593	1,401	1509	1,658	1,471
El Arish	212	280	433	555	533	480	536	579	295
Port Said a]	0	0	0	0	0	0	0	0	0
Suez a]	0	0	0	0	0	0	0	0	0
South Sinai a]	0	0	0	0	0	0	0	0	0
Total	746,251	639,027	774,826	777,037	791,525	790,388	793,357	741,357	420,970
Upper Egypt	170,775	137,894	176,047	177,655	172,036	172,989	177,285	171,426	123,697
Middle Egypt	195,507	147,794	185,534	184,879	195,726	186,491	191,217	177,302	91,131
Lower Egypt	379,969	353,339	413,245	414,503	423,763	430,908	424,955	392,620	206,141
ADJUSTMENTS FOR NON PBDAC SALES									
Total Factory Deliveries						683,433	667,285	635,805	671,688
Total imports						175,583	140,570	141,553	29,217
Total Supply						859,016	807,855	777,359	700,905
PBDAC Deliveries						683,433	626,180	538,803	378,030
PBDAC Stock Change						66,668	(21,100)	(61,110)	(13,828)
PBDAC Apparent Sales						792,348	787,850	741,466	421.075
Other deliveries						0	40,940	99,820	317,980
Total Consumption	746,251	639,027	774,826	777,037	791,525	790,388	834,297	841,177	738,950

Note: (a) Included in Cairo data.

Source: PBDAC and CIC

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Annex Table 12.3 EGYPT: Phosphate Use by Governorate, 1983/4 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt P2O5)

GOVERNORATE	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Beheira	24,779	27,160	28,510	29,640	31,076	28,408	28,160	31,602	21,185
Kafr El Sheik	10,511	10,118	11,422	11,209	11,565	11,255	11,140	13,020	8,325
Gharbia	10,243	10,365	13,631	11,020	11,113	10,861	10,983	14,425	6,921
Dakahlia	15,885	14,670	16,664	16,438	16,485	15,780	14,900	19,324	9,656
Damietta	2,600	2,550	2,684	2,769	2,833	2,790	2,403	3,125	1,918
Sharkia	16,381	16,089	16,684	16,687	16,660	17,105	15,839	20,252	9,970
Ismailia	2,824	3,019	4,167	4,474	4,602	3,979	2,595	3,054	1,268
Menofia	10,243	12,124	12,670	12,492	14,009	12,004	11,252	11,789	3,895
Kalubia	5,688	6,169	5,814	5,698	5,658	5,370	4,804	4,369	1,818
Giza	5,741	5,968	5,903	6,773	7,214	6,086	5,129	4,329	1,790
Beni Suef	5,208	5,465	6,176	6,870	7,102	7,287	6,002	6,131	2,756
Fayoum	6,345	6,566	7,930	7,923	7,903	7,099	6,191	5,610	2,355
Minya	11,954	12,607	14,725	15,397	15,713	14,969	13,178	15,806	7,100
Assiut	7,759	8,005	9,683	8,508	8,462	8,888	7,502	9,870	4,388
Sohag	4,501	4,965	5,735	6,269	6,357	6,297	5,803	7,621	4,505
Qena	11,858	11,318	13,889	14,045	13,706	12,707	11,180	7,032	4 946
Aswan	4,289	3,849	5,296	4,428	4,481	3,876	3,616	1,848	2,244
Alexandria	2,327	2,559	2,772	4,055	5,049	4,690	3,915	4,758	1,764
Cairo	155	171	211	233	287	256	208	166	116
New Valley	310	316	373	453	567	500	386	408	388
El Arish	22	15	19	20	24	22	20	16	21
Port Said a]	0	0	0	0	0	0	0	0	0
Suez a]	0	0	0	0	0	0	0	0	0
South Sinai a]	0	0	0	0	0	0	0	0	0
Total	159,623	164,068	184,958	185,407	190,866	180,290	165,206	184,556	97,330
Upper Egypt	28,407	28,137	34,603	33,250	33,005	31,828	28,101	26,371	16,084
Middle Egypt	34,936	36,775	40,548	42,661	43,590	40,811	35,304	36,245	15,821
Lower Egypt	96,280	99,156	109,807	109,496	114,271	107,650	101,801	121,940	65,425

ADJUSTMENTS FOR NON PBDAC SALES	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Total Factory Deliveries						192,863	202,238	164,128	124,350
Total imports						0	0	0	0
Total Supply						192,863	202,238	164,128	124,350
PBDAC Deliveries						191,132	197,375	164,128	83,654
PBDAC Stock Change						10,431	32,170	(20,444)	(13,675)
PBDAC Apparent Sales						180,701	165,205	184,572	97,329
Deliveries to Others						1,731	4,863	2,250	27,600
Total Consumption	159,623	164,068	184,958	185,407	190,866	182,021	170,069	186,806	124,930

Note: (a) Included in Cairo data.

Source: PBDAC and CIC.

Annex Table 12.4 EGYPT: Potash Use by Governorate, 1983/4 to 1991/92

IFDC Fertilizer Policy Study 1993

(Metric Tons K2O)

GOVERNORATE	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Beheira	3,204	3,998	3,696	4,764	5,034	4409	4630	7536	5772
Kafr El Sheik	322	416	316	356	396	304	131	284	948
Gharbia	555	1,546	1,377	1,355	1,220	1250	1260	812	954
Dakahlia	928	1,794	1,984	2,209	2,347	2625	1773	957	1068
Damietta	189	262	195	224	159	107	67	39	95
Sharkia	2,774	3,199	2,846	2,571	2,784	2774	2199	2794	1473
Ismailia	1,765	1,307	847	1,393	1,231	1320	907	1611	932
Menofia	883	1,370	1,080	1,082	1,064	988	1074	634	790
Kalubia	434	1,761	1,202	1,269	978	782	1020	928	588
Giza	372	543	618	972	1,135	1034	906	1382	911
Beni Suef	166	130	202	209	220	292	202	220	444
Fayoum	89	172	286	620	672	416	723	613	214
Minya	708	1,545	1,362	2,112	1,350	1327	837	900	780
Assiut	879	1,844	1,924	2,448	2,044	2354	498	829	711
Sohag	14	6	27	166	152	228	116	580	1223
Qena	3,704	3,730	4,833	5,212	6,057	4204	3371	3998	2615
Aswan	382	516	1,460	1,710	1,810	1684	1301	1908	1032
Alexandria	74	28	94	184	784	886	82	1373	442
Cairo	5	39	3	21	15	11	44	38	18
New Valley	12	9	4	6	11	6	14	13	9
El Arish	13	28	12	24	26	23	36	16	23
Port Said a)	0	0	0	0	0	0	0	0	0
Suez a)	0	0	0	0	0	0	0	0	0
South Sinai a)	0	0	0	0	0	0	0	0	0
Total	17,472	24,243	24,368	28,887	29,493	27,035	21,169	27,715	21,042
Upper Egypt	4,979	6,096	8,244	9,536	10,063	8,450	5,285	7,315	5,580
Middle Egypt	1,769	4,151	3,670	5,182	4,355	3,851	3,688	4,243	2,938
Lower Egypt	10,724	13,996	12,454	14,169	15,074	14,734	12,216	16,157	12,524
ADJUSTMENTS FOR NON PBDAC SALES									
Total Factory Deliveries						0	0	0	0
Total imports						38496	288	63353	12588
Total Supply						38493	288	63353	12538
PBDAC Deliveries						0	0	0	0
PBDAC Stock Change						11388	-20986	35542	-8502
PBDAC Apparent Sales						27035	21189	27715	21042
Other deliveries						0	0	0	0
Total Consumption	17472	24243	24368	28887	29493	27035	21189	27715	21042

Note: (a) Included in Cairo data.

Source: PBDAC and CIC

Annex Table 12.5 EGYPT: PBDAC Total Fertilizer Sales by Governorate, 1991/92

IFDC Fertilizer Policy Impact Study 1993

PRODUCT	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
ANALYSIS	46%	33.5%	31.5%	15.5%	20.6%	15%	37.5%	46%	48%
GOV.\PRODUCT TONNES									
BEHEIRA	46622	28188	0	7283	66869	129246	4794	0	12026
KAFR EL SHEIK	22315	31185	0	6834	39466	45975	3809	0	1974
GHARBIA	11138	18367	0	28751	37843	42937	1280	0	1909
DAKAHILA	23370	30885	0	4024	33610	60000	1748	0	2224
DAMIETTA	3411	4473	0	463	7903	12224	225	0	198
SHARKIA	32139	25004	0	31800	46503	60596	2347	0	3069
ISMAILIA	1601	9697	0	845	7537	8305	60	0	1941
MENOFIA	12647	15235	0	32938	11347	22475	1397	0	1646
KALUBIA	3018	10631	0	24400	6614	9875	839	0	12[illegible]6
GIZA	16033	6996	0	18883	5035	9831	842	0	1898
BENI SUEF	22449	23209	0	1308	587	14441	1574	0	926
FAYOUM	26139	9821	0	197	2072	15156	218	0	445
MINYA	37519	45464	0	0	3242	44386	1180	0	1626
ASSIUT	33685	31108	0	0	3428	22498	2703	0	1481
SOHAG	30290	35468	0	0	57	21494	8415	0	2547
QENA	42976	91697	0	0	0	16374	6541	0	5449
ASWAN	0	61970	0	0	0	13266	678	0	2149
ALEXANDRIA	1163	17563	0	0	5340	11757	0	0	921
CAIRO	333	26	0	733	900	774	0	0	38
NEW VALLEY	3063	0	0	0	301	2585	1	0	19
EL ARISH	341	0	0	24	652	143	0	0	[illegible]7
PORT SAID *	0	0	0	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0
TOTAL	370252	496988	0	150488	289306	564338	33811	0	43837
UPPER EGYPT	106951	220243	0	0	3485	73632	13437	0	11625
MIDDLE EGYPT	105158	96121	0	44793	17550	93689	4713	0	6121
LOWER EGYPT	158143	180624	0	113695	268271	397017	15661	0	26091

* NOTE: Port Said, Suez and South Sinai included in Cairo data

1991/92

GOV.\PRODUCT MIX	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
BEHEIRA	46.8%	20.6%	0.0%	2.5%	30.1%	91.5%	8.5%	0.0%	100.0%
KAFR EL SHEIK	34.3%	34.9%	0.0%	3.5%	27.2%	82.8%	17.2%	0.0%	100.0%
GHARBIA	21.8%	26.2%	0.0%	18.9%	33.1%	93.1%	6.9%	0.0%	100.0%
DAKAHILA	36.0%	34.6%	0.0%	2.1%	27.3%	93.2%	6.8%	0.0%	100.0%
DAMIETTA	32.9%	31.4%	0.0%	1.5%	34.1%	95.6%	4.4%	0.0%	100.0%
SHARKIA	39.2%	22.2%	0.0%	13.1%	25.4%	91.2%	8.8%	0.0%	100.0%
ISMAILIA	13.0%	57.3%	0.0%	2.3%	27.4%	98.2%	1.8%	0.0%	100.0%
MENOFIA	31.7%	27.8%	0.0%	27.8%	12.7%	86.6%	13.4%	0.0%	100.0%
KALUBIA	13.8%	35.3%	0.0%	37.5%	13.5%	81.5%	18.5%	0.0%	100.0%
GIZA	53.9%	17.1%	0.0%	21.4%	7.6%	82.4%	17.6%	0.0%	100.0%
BENI SUEF	56.0%	42.2%	0.0%	1.1%	0.7%	78.6%	21.4%	0.0%	100.0%
FAYOUM	76.2%	20.9%	0.0%	0.2%	2.7%	96.5%	3.5%	0.0%	100.0%
MINYA	52.1%	45.9%	0.0%	0.0%	2.0%	93.8%	6.2%	0.0%	100.0%
ASSIUT	58.2%	39.1%	0.0%	0.0%	2.7%	76.9%	23.1%	0.0%	100.0%
SOHAG	53.9%	46.0%	0.0%	0.0%	0.0%	71.6%	28.4%	0.0%	100.0%
QENA	39.2%	60.8%	0.0%	0.0%	0.0%	49.7%	50.3%	0.0%	100.0%
ASWAN	0.0%	100.0%	0.0%	0.0%	0.0%	88.7%	11.3%	0.0%	100.0%
ALEXANDRIA	6.4%	70.5%	0.0%	0.0%	23.1%	100.0%	0.0%	0.0%	100.0%
CAIRO	33.2%	1.9%	0.0%	24.7%	40.2%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	95.8%	0.0%	0.0%	0.0%	4.2%	99.9%	0.1%	0.0%	100.0%
EL ARISH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	40.5%	39.5%	0.0%	5.8%	14.2%	87.0%	13.0%	0.0%	100.0%
UPPER EGYPT	39.8%	59.6%	0.0%	0.0%	0.6%	68.7%	31.3%	0.0%	100.0%
MIDDLE EGYPT	53.1%	35.3%	0.0%	7.6%	4.0%	88.8%	11.2%	0.0%	100.0%
LOWER EGYPT	35.3%	29.4%	0.0%	8.5%	26.8%	91.0%	9.0%	0.0%	100.0%

Note: PBDAC sales only which were approximately 60% of total market

Source: PBDAC

Annex Table12.6 EGYPT: Total Fertilizer Sales by Governorate, 1990/91

IFDC Fertilizer Policy Impact Study 1993

PRODUCT	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
ANALYSIS	46%	33.5%	31%	15.5%	20.6%	15%	37.5%	46%	48%
GOV.\PRODUCT TONNES									
BEHEIRA	99096	76610	0	363	117334	175647	14014	0	15700
KAFR EL SHEIK	32260	49985	0	33	62025	73418	5353	0	592
GHARBIA	37080	30664	0	52316	41560	77641	7411	0	1692
DAKAHILA	60747	53295	0	88	42536	110019	7522	0	1993
DAMIETTA	6327	5130	0	40	5690	19021	726	0	82
SHARKIA	65408	60955	0	51402	55406	116774	7297	0	5820
ISMAILIA	5497	27391	0	205	7404	20362	0	0	3357
MENOFIA	38529	40442	0	54068	13259	66706	4755	0	1425
KALUBIA	6046	30875	0	45402	14036	21308	3127	0	1933
GIZA	41475	13817	0	37811	7694	20174	3474	0	2879
BENI SUEF	38046	44288	0	810	290	35741	2052	0	458
FAYOUM	46823	30147	0	0	3889	33942	1383	0	1693
MINYA	76345	66755	0	0	3169	97461	3166	0	1876
ASSIUT	66173	32832	0	0	3846	60512	2115	0	1728
SOHAG	53106	41006	0	30	18	34213	6638	0	1208
QENA	74688	100008	0	0	0	23518	9346	0	8330
ASWAN	0	69140	0	0	0	10319	800	0	3974
ALEXANDRIA	2666	38573	0	4	17637	26325	2159	0	2860
CAIRO	985	73	0	1721	1854	1104	0	0	79
NEW VALLEY	3579	0	0	0	57	2718	0	0	27
EL ARISH	1026	0	0	54	477	106	0	0	34
PORT SAID *	0	0	0	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0
TOTAL	757902	811364	0	244337	402111	1027029	81338	0	57740
UPPER EGYPT	193967	242986	0	30	3864	128562	18899	0	15240
MIDDLE EGYPT	202689	155007	0	38621	15042	187318	10075	0	6906
LOWER EGYPT	361246	413991	0	205686	383205	711149	52364	0	35594

* NOTE:Port Said,Suez and South Sinai included in Cairo data

1990/91

GOV.\PRODUCT MIX	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
BEHEIRA	47.7%	26.9%	0.0%	0.1%	25.3%	83.4%	16.6%	0.0%	100.0%
KAFR EL SHEIK	33.3%	37.6%	0.0%	0.0%	29.1%	84.6%	15.4%	0.0%	100.0%
GHARBIA	38.8%	23.3%	0.0%	18.4%	19.5%	80.7%	19.3%	0.0%	100.0%
DAKAHILA	51.2%	32.7%	0.0%	0.0%	16.1%	85.4%	14.6%	0.0%	100.0%
DAMIETTA	52.1%	23.4%	0.0%	0.1%	24.4%	91.3%	8.7%	0.0%	100.0%
SHARKIA	43.0%	29.2%	0.0%	11.4%	16.4%	86.5%	13.5%	0.0%	100.0%
ISMAILIA	19.1%	69.2%	0.0%	0.2%	11.5%	100.0%	0.0%	0.0%	100.0%
MENOFIA	41.0%	32.0%	0.0%	19.6%	6.4%	84.9%	15.1%	0.0%	100.0%
KALUBIA	12.1%	44.9%	0.0%	30.5%	12.5%	73.2%	26.8%	0.0%	100.0%
GIZA	61.2%	14.9%	0.0%	18.8%	5.1%	69.9%	30.1%	0.0%	100.0%
BENI SUEF	53.8%	45.6%	0.0%	0.4%	0.2%	87.4%	12.6%	0.0%	100.0%
FAYOUM	66.4%	31.1%	0.0%	0.0%	2.5%	90.8%	9.2%	0.0%	100.0%
MINYA	60.4%	38.5%	0.0%	0.0%	1.1%	92.5%	7.5%	0.0%	100.0%
ASSIUT	72.1%	26.0%	0.0%	0.0%	1.9%	92.0%	8.0%	0.0%	100.0%
SOHAG	64.0%	36.0%	0.0%	0.0%	0.0%	67.3%	32.7%	0.0%	100.0%
QENA	50.6%	49.4%	0.0%	0.0%	0.0%	50.2%	49.0%	0.0%	100.0%
ASWAN	0.0%	100.0%	0.0%	0.0%	0.0%	83.8%	16.2%	0.0%	100.0%
ALEXANDRIA	6.9%	72.6%	0.0%	0.0%	20.5%	83.0%	17.0%	0.0%	100.0%
CAIRO	40.2%	2.2%	0.0%	23.7%	33.9%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	99.3%	0.0%	0.0%	0.0%	0.7%	100.0%	0.0%	0.0%	100.0%
EL ARISH	81.6%	0.0%	0.0%	1.4%	17.0%	100.0%	0.0%	0.0%	100.0%
TOTAL	47.0%	36.7%	0.0%	5.1%	11.2%	83.5%	16.5%	0.0%	100.0%
UPPER EGYPT	52.0%	47.5%	0.0%	0.0%	0.5%	73.1%	26.9%	0.0%	100.0%
MIDDLE EGYPT	60.4%	33.7%	0.0%	3.9%	2.0%	88.1%	11.9%	0.0%	100.0%
LOWER EGYPT	40.0%	33.4%	0.0%	7.7%	19.0%	84.5%	15.5%	0.0%	100.0%

Source: PBDAC

Annex Table 12.7 EGYPT: Total Fertilizer Sales by Governorate, 1989/90

IFDC Fertilizer Policy Impact Study 1993

PRODUCT	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT	NUTRIENTS		
ANALYSIS	46%	33.5%	31%	15.5%	20.6%	15%	37.5%	46%	48%	N	P2O5	K2O
GOV.\PRODUCT TONNES												
BEHEIRA	141794	69316	0	105	87357	165771	8785	0	9646	106458	28160	4630
KAFR EL SHEIK	45587	45522	0	0	41067	57302	6787	0	273	44680	11140	131
GHARBIA	58118	25851	0	37000	37116	61914	4522	0	2624	48775	10983	1260
DAKAHILA	56153	72374	0	89	39315	78404	8372	0	3694	58188	14900	1773
DAMIETTA	9855	6611	0	0	7489	15375	259	0	139	8291	2403	67
SHARKIA	80833	67557	0	45764	48795	89830	6305	0	4581	76290	15839	2199
ISMAILIA	3992	30814	0	0	8581	17300	0	0	1889	13927	2595	907
MENOFIA	45120	47640	0	57959	10954	64902	4045	0	2238	47955	11252	1074
KALU'BIA	3587	43414	0	56622	10827	27810	1687	0	2125	27200	4804	1020
GIZA	38642	17780	0	46423	8295	25110	3634	0	1887	32636	5129	906
BENI SUEF	43387	37753	0	422	163	34705	2124	0	421	32704	6002	202
FAYOUM	55964	31495	0	0	5223	33320	3181	0	1507	37370	6191	723
MINYA	75200	78614	0	0	1838	76526	4530	0	1744	61306	13178	837
ASSIUT	61739	39875	0	20	0	46831	1274	0	1034	41761	7502	496
SOHAG	57118	42415	0	0	0	31137	3020	0	242	40483	5803	116
QENA	74910	107502	0	0	0	60451	5632	0	7023	70472	11180	3371
ASWAN	0	73339	0	0	0	19284	1928	0	2711	24569	3616	1301
ALEXANDRIA	4715	35496	0	16	14321	26097	0	0	170	17136	3915	82
CAIRO	935	51	0	2145	1605	1387	0	0	91	1110	208	44
NEW VALLEY	3260	0	0	0	27	2572	0	0	29	1509	386	14
EL ARISH	924	0	0	10	531	131	0	0	75	536	20	38
PORT SAID *	0	0	0	0	0	0	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	861842	871419	0	246575	324104	936159	66085	0	44143	793357	165206	21189
UPPER EGYPT	193767	263131	0	20	0	157703	11854	0	11010	177284.8	28100.7	5284.8
MIDDLE EGYPT	216780	209056	0	103467	26346	197471	15156	0	7684	191217.2	35304.15	3688.32
LOWER EGYPT	451295	399232	0	143088	297758	500985	39075	0	25449	424855.2	101800.9	12215.52

* NOTE:Port Said,Suez and South Sinai included in Cairo data

1989/90

GOV \PRODUCT MIX	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
BEHEIRA	61.3%	21.8%	0.0%	0.0%	16.9%	88.3%	11.7%	0.0%	100.0%
KAFR EL SHEIK	46.9%	34.1%	0.0%	0.0%	18.9%	77.2%	22.8%	0.0%	100.0%
GHARBIA	54.8%	17.8%	0.0%	11.9%	15.7%	84.6%	15.4%	0.0%	100.0%
DAKAHILA	44.4%	41.7%	0.0%	0.0%	13.9%	78.9%	21.1%	0.0%	100.0%
DAMIETTA	54.7%	26.7%	0.0%	0.0%	18.6%	96.0%	4.0%	0.0%	100.0%
SHARKIA	48.7%	28.8%	0.0%	9.3%	13.2%	85.1%	14.9%	0.0%	100.0%
ISMAILIA	13.2%	74.1%	0.0%	0.0%	12.7%	100.0%	0.0%	0.0%	100.0%
MENOFIA	43.3%	33.3%	0.0%	18.7%	4.7%	86.5%	13.5%	0.0%	100.0%
KALUBIA	6.1%	53.5%	0.0%	32.3%	8.2%	86.8%	13.2%	0.0%	100.0%
GIZA	54.5%	18.3%	0.0%	22.0%	5.2%	73.4%	26.6%	0.0%	100.0%
BENI SUEF	61.0%	38.7%	0.0%	0.2%	0.1%	86.7%	13.3%	0.0%	100.0%
FAYOUM	68.9%	28.2%	0.0%	0.0%	2.9%	80.7%	19.3%	0.0%	100.0%
MINYA	56.4%	43.0%	0.0%	0.0%	0.6%	87.1%	12.9%	0.0%	100.0%
ASSIUT	68.0%	32.0%	0.0%	0.0%	0.0%	93.6%	6.4%	0.0%	100.0%
SOHAG	64.9%	35.1%	0.0%	0.0%	0.0%	80.5%	19.5%	0.0%	100.0%
QENA	48.9%	51.1%	0.0%	0.0%	0.0%	81.1%	18.9%	0.0%	100.0%
ASWAN	0.0%	100.0%	0.0%	0.0%	0.0%	80.0%	20.0%	0.0%	100.0%
ALEXANDRIA	12.7%	69.4%	0.0%	0.0%	17.9%	100.0%	0.0%	0.0%	100.0%
CAIRO	38.7%	1.5%	0.0%	29.9%	29.8%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	99.6%	0.0%	0.0%	0.0%	0.4%	100.0%	0.0%	0.0%	100.0%
EL ARISH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	50.0%	36.8%	0.0%	4.8%	8.4%	85.0%	15.0%	0.0%	100.0%
UPPER EGYPT	50.3%	49.7%	0.0%	0.0%	0.0%	84.2%	15.8%	0.0%	100.0%
MIDDLE EGYPT	52.1%	36.6%	0.0%	8.4%	2.8%	83.9%	16.1%	0.0%	100.0%
LOWER EGYPT	48.9%	31.5%	0.0%	5.2%	14.4%	85.6%	14.4%	0.0%	100.0%

Source: PBDAC

Annex Table 12.8 EGYPT: Total Fertilizer Sales by Governorate 1988/89

IFDC Fertilizer Policy Impact Study 1990

PRODUCT / ANALYSIS	UREA 46%	AN 33.5%	CAN 31%	CN 15.5%	AS 20.6%	SSP 15%	CSP 37.5%	TSP 46%	SUL POT 48%
GOV.\PRODUCT TONNES									
BEHEIRA	138296	87151	0	0	77901	160486	11561	0	9247
KAFR EL SHEIK	45504	43435	0	85	43551	63759	4511	0	634
GHARBIA	46792	36199	0	33227	46606	54876	7013	0	2604
DAKAHILA	64453	65519	0	30	37127	62613	17035	0	5469
DAMIETTA	8096	7090	0	0	9679	18098	201	0	223
SHARKIA	75837	72844	0	48230	56736	80230	13520	0	5779
ISMAILIA	2529	34058	0	35	9707	26525	0	0	2750
MENOFIA	49401	51310	0	53499	12428	62336	7076	0	2059
KALUBIA	8872	41184	0	48455	11151	31604	1679	0	1630
GIZA	38425	17084	0	42497	6145	31042	3812	0	2154
BENI SUEF	40621	37808	0	1462	183	40112	3388	0	608
FAYOUM	46274	39354	0	0	1193	41972	2141	0	867
MINYA	71120	83405	0	0	2624	69908	11955	0	2764
ASSIUT	62733	42363	0	0	0	53604	2224	0	4904
SOHAG	55040	39858	0	0	0	37822	1082	0	476
QENA	74209	103350	0	0	0	61017	3003	0	8758
ASWAN	0	67198	0	0	0	18582	2904	0	3486
ALEXANDRIA	5531	26512	0	0	17327	31266	0	0	1846
CAIRO	880	58	0	2548	1634	1707	0	0	23
NEW VALLEY	3042	0	0	0	8	3330	0	0	13
EL ARISH	916	0	0	0	284	149	0	0	48
PORT SAID *	0	0	0	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0
TOTAL	838591	695860	0	230070	334284	951128	100321	0	56322
UPPER EGYPT	191982	252769	0	0	0	171115	16429	0	17604
MIDDLE EGYPT	205312	218915	0	92414	21296	214638	22975	0	8023
LOWER EGYPT	441297	424176	0	137656	312988	565375	60917	0	30695

* NOTE: Port Said, Suez and South Sinai included in Cairo data

1988/89

GOV/PRODUCT	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
BEHEIRA	58.4%	26.8%	0.0%	0.0%	14.7%	84.7%	15.3%	0.0%	100.0%
KAFR EL SHEIK	47.1%	32.7%	0.0%	0.0%	20.2%	85.0%	15.0%	0.0%	100.0%
GHARBIA	44.5%	25.1%	0.0%	10.6%	19.8%	75.8%	24.2%	0.0%	100.0%
DAKAHILA	50.0%	37.0%	0.0%	0.0%	12.9%	59.5%	40.5%	0.0%	100.0%
DAMIETTA	46.0%	29.3%	0.0%	0.0%	24.6%	97.3%	2.7%	0.0%	100.0%
SHARKIA	44.5%	31.1%	0.0%	9.5%	14.9%	70.4%	29.6%	0.0%	100.0%
ISMAILIA	8.0%	78.3%	0.0%	0.0%	13.7%	100.0%	0.0%	0.0%	100.0%
MENOFIA	44.8%	33.9%	0.0%	16.3%	5.0%	77.9%	22.1%	0.0%	100.0%
KALUBIA	14.7%	49.8%	0.0%	27.1%	8.3%	88.3%	11.7%	0.0%	100.0%
GIZA	56.6%	18.3%	0.0%	21.1%	4.1%	76.5%	23.5%	0.0%	100.0%
BENI SUEF	59.1%	40.1%	0.0%	0.7%	0.1%	82.6%	17.4%	0.0%	100.0%
FAYOUM	61.3%	38.0%	0.0%	0.0%	0.7%	88.7%	11.3%	0.0%	100.0%
MINYA	53.5%	45.7%	0.0%	0.0%	0.9%	70.1%	29.9%	0.0%	100.0%
ASSIUT	67.0%	33.0%	0.0%	0.0%	0.0%	90.6%	9.4%	0.0%	100.0%
SOHAG	65.5%	34.5%	0.0%	0.0%	0.0%	90.1%	9.9%	0.0%	100.0%
QENA	49.6%	50.4%	0.0%	0.0%	0.0%	71.7%	28.3%	0.0%	100.0%
ASWAN	0.0%	100.0%	0.0%	0.0%	0.0%	71.9%	28.1%	0.0%	100.0%
ALEXANDRIA	17.0%	59.2%	0.0%	0.0%	23.8%	100.0%	0.0%	0.0%	100.0%
CAIRO	35.0%	1.7%	0.0%	34.2%	29.1%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	99.9%	0.0%	0.0%	0.0%	0.1%	100.0%	0.0%	0.0%	100.0%
EL ARISH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	48.8%	38.0%	0.0%	4.5%	8.7%	79.1%	20.9%	0.0%	100.0%
UPPER EGYPT	51.1%	48.9%	0.0%	0.0%	0.0%	80.6%	19.4%	0.0%	100.0%
MIDDLE EGYPT	50.6%	39.3%	0.0%	7.7%	2.4%	78.9%	21.1%	0.0%	100.0%
LOWER EGYPT	47.1%	33.0%	0.0%	5.0%	15.0%	78.8%	21.2%	0.0%	100.0%

Source: PBDAC

Annex Table 12.9 EGYPT: Total Fertilizer Sales by Governorate 1987/88

IFDC Fertilizer Policy Impact Study 1990

PRODUCT	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
ANALYSIS	46%	33.5%	31.5%	15.5%	20.6%	15%	37.5%	46%	48%
GOV.\PRODUCT TONNES									
BEHEIRA	141599	20465	38259	10	79773	164525	17014	39	10488
KAFR EL SHEIK	54612	13950	18606	0	42210	60821	3972	119	825
GHARBIA	45018	12622	18461	46983	50084	60009	5399	198	2542
DAKAHILA	69081	17356	36658	45	42955	74258	14050	176	4890
DAMIETTA	9107	2058	3031	0	7332	18217	268	0	331
SHARKIA	87079	16858	27967	52313	67222	69141	16421	298	5800
ISMAILIA	7101	5870	28384	0	11550	30060	120	0	2565
MENOFIA	65559	18587	20372	58229	13345	78332	5504	103	2217
KALUBIA	16236	20378	13005	44632	10142	33614	1593	42	2038
GIZA	48825	19346	439	41420	5749	35777	4323	3	2365
BENI SUEF	49321	19755	11939	461	301	43015	1721	10	458
FAYOUM	62215	14173	11878	0	2735	42370	4122	4	1400
MINYA	84590	24075	42613	77	3603	76910	11117	0	2813
ASSIUT	67773	3835	23517	0	6	55448	336	0	4258
SOHAG	58430	29	37880	0	0	37783	1826	11	317
QENA	75478	0	113772	0	0	60354	12168	0	12619
ASWAN	0	622	75667	0	0	25003	1948	0	3771
ALEXANDRIA	14692	11676	4319	0	12842	33660	0	0	1633
CAIRO	845	0	60	2732	1444	1913	0	0	31
NEW VALLEY	3463	0	0	0	1	3780	0	0	23
EL ARISH	1068	0	0	0	203	169	0	0	60
PORT SAID *						0	0	0	0
SUEZ *						0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0
TOTAL	960290	224955	528237	246903	351499	1012118	102952	1003	61442
UPPER EGYPT	201680	4465	250836	0	6	179187	16328	11	20955
MIDDLE EGYPT	261185	97726	79934	86591	22530	231735	23477	59	9073
LOWER EGYPT	497424	122742	197467	160312	328963	601196	63147	933	31404

* NOTE: Port Said, Suez and South Sinai included in Cairo data

GOV \PRODUCT MIX	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL. POT
BEHEIRA	64.3%	7.8%	11.7%	0.0%	16.2%	79.4%	20.5%	0.1%	100.0%
KAFR EL SHEIK	56.5%	10.6%	13.1%	0.0%	19.8%	86.7%	12.9%	0.5%	100.0%
GHARBIA	41.8%	8.9%	12.1%	15.4%	21.8%	81.0%	18.2%	0.8%	100.0%
DAKAHILA	55.3%	10.0%	19.5%	0.0%	15.2%	67.6%	32.0%	0.5%	100.0%
DAMIETTA	54.5%	10.3%	15.5%	0.0%	19.6%	96.5%	3.5%	0.0%	100.0%
SHARKIA	52.5%	7.4%	11.4%	10.6%	18.1%	62.3%	37.0%	0.8%	100.0%
ISMAILIA	19.9%	12.0%	53.6%	0.0%	14.5%	99.0%	1.0%	0.0%	100.0%
MENOFIA	55.2%	11.4%	11.8%	16.5%	5.0%	83.9%	15.8%	0.3%	100.0%
KALUBIA	27.3%	25.0%	14.8%	25.3%	7.6%	89.1%	10.6%	0.3%	100.0%
GIZA	61.2%	17.7%	0.4%	17.5%	3.2%	74.4%	25.6%	0.0%	100.0%
BENI SUEF	68.5%	20.0%	11.2%	0.2%	0.2%	90.9%	9.1%	0.1%	100.0%
FAYOUM	76.1%	12.6%	9.8%	0.0%	1.5%	80.4%	19.6%	0.0%	100.0%
MINYA	63.9%	13.2%	21.7%	0.0%	1.2%	73.5%	26.5%	0.0%	100.0%
ASSIUT	78.4%	3.2%	18.3%	0.0%	0.0%	98.3%	1.7%	0.0%	100.0%
SOHAG	69.6%	0.0%	30.4%	0.0%	0.0%	89.2%	10.8%	0.1%	100.0%
QENA	49.6%	0.0%	50.4%	0.0%	0.0%	66.7%	33.3%	0.0%	100.0%
ASWAN	0.0%	0.9%	99.1%	0.0%	0.0%	83.7%	16.3%	0.0%	100.0%
ALEXANDRIA	46.1%	26.7%	9.1%	0.0%	18.1%	100.0%	0.0%	0.0%	100.0%
CAIRO	34.5%	0.0%	1.6%	37.5%	26.4%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
EL ARISH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	55.8%	9.5%	21.0%	4.8%	9.1%	79.5%	20.2%	0.2%	100.0%
UPPER EGYPT	53.9%	0.9%	45.2%	0.0%	0.0%	81.4%	18.6%	0.0%	100.0%
MIDDLE EGYPT	61.4%	16.7%	12.7%	6.9%	2.4%	79.7%	20.2%	0.1%	100.0%
LOWER EGYPT	54.0%	9.7%	14.4%	5.9%	16.0%	78.9%	20.7%	0.4%	100.0%

Source: PBDAC

Annex Table 12.10 EGYPT: Total Fertilizer Sales by Governorate 1986/87

IFDC Fertilizer Policy Impact Study 1993

PRODUCT	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
ANALYSIS	46%	33.5%	31.5%	15.5%	20.6%	15%	37.5%	46%	48%
GOV.\PRODUCT TONNES									
BEHEIRA	161472	19329	51177	13	104313	158366	15218	118	9925
KAFR EL SHEIK	56311	10832	22753	0	50461	65360	3610	367	742
GHARBIA	37450	8180	18852	44868	49997	60051	5020	624	2823
DAKAHILA	70914	13117	43635	50	49583	74728	13139	558	4602
DAMIETTA	11231	2166	5615	0	10369	17968	246	0	467
SHARKIA	79401	11448	29913	52325	70205	69888	15424	949	5356
ISMAILIA	6460	3977	30290	0	12049	29800	109	0	2902
MENOFIA	50277	10617	18776	48986	11736	70490	4937	292	2254
KALUBIA	12755	11924	12040	38466	9137	34161	1505	134	2644
GIZA	38747	11435	409	36058	5232	33899	4335	9	2025
BENI SUEF	44716	13339	12697	458	312	41990	1561	31	435
FAYOUM	58786	9974	13165	0	2964	42868	3875	13	1292
MINYA	80357	17033	47484	81	3924	76107	10216	0	4400
ASSIUT	72415	3052	29475	0	7	56265	364	0	5100
SOHAG	53813	20	40922	0	0	37601	1689	34	346
QENA	68769	0	121592	0	0	63034	11693	0	10858
ASWAN	0	413	79099	0	0	24906	1805	0	3563
ALEXANDRIA	14733	8721	5080	0	14767	27279	0	0	342
CAIRO	523	0	44	1853	1024	1566	0	0	44
NEW VALLEY	3079	0	0	0	1	3047	0	0	13
EL ARISH	1127	0	0	0	246	173	0	0	50
PORT SAID *	0	0	0	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0	0	0	0
TOTAL	923336	156160	583016	223158	396803	960586	94747	3129	60181
UPPER EGYPT	194995	3405	271088	0	7	181837	15551	34	19867
MIDDLE EGYPT	235362	63705	85795	75063	21569	229025	21492	187	10796
LOWER EGYPT	492978	88990	226133	148095	375231	578724	57703	2908	29519

* NOTE: Port Said, Suez and South Sinai included in Cairo data

1986/87

GOV.\PRODUCT MIX	% OF TOTAL N					% OF TOTAL P2O5			
	UREA	AN	CAN	CN	AS	SSP	CSP	TSP	SUL POT
BEHEIRA	62.6%	5.6%	13.4%	0.0%	18.1%	80.5%	19.3%	0.2%	100.0%
KAFR EL SHEIK	55.0%	7.7%	15.0%	0.0%	22.1%	86.6%	12.0%	1.5%	100.0%
GHARBIA	39.9%	6.4%	13.5%	16.1%	23.9%	80.6%	16.8%	2.6%	100.0%
DAKAHILA	53.4%	7.2%	22.2%	0.0%	16.9%	68.4%	30.1%	1.6%	100.0%
DAMIETTA	52.7%	7.4%	17.8%	0.0%	21.8%	96.7%	3.3%	0.0%	100.0%
SHARKIA	50.5%	5.3%	12.6%	11.2%	20.0%	62.8%	34.6%	2.6%	100.0%
ISMAILIA	18.2%	8.2%	57.5%	0.0%	15.2%	99.1%	0.9%	0.0%	100.0%
MENOFIA	54.3%	8.3%	13.7%	17.0%	5.7%	84.2%	14.7%	1.1%	100.0%
KALUBIA	27.3%	18.6%	17.4%	27.7%	8.8%	89.1%	9.8%	1.1%	100.0%
GIZA	62.6%	13.5%	0.4%	19.6%	3.8%	75.7%	24.2%	0.1%	100.0%
BENI SUEF	70.5%	15.3%	13.5%	0.2%	0.2%	91.3%	8.5%	0.2%	100.0%
FAYOUM	77.0%	9.5%	11.6%	0.0%	1.7%	81.5%	18.4%	0.1%	100.0%
MINYA	63.2%	9.8%	25.2%	0.0%	1.4%	74.9%	25.1%	0.0%	100.0%
ASSIUT	76.4%	2.3%	20.9%	0.0%	0.0%	98.4%	1.6%	0.0%	100.0%
SOHAG	65.7%	0.0%	33.7%	0.0%	0.0%	89.7%	10.1%	0.3%	100.0%
QENA	45.2%	0.0%	53.9%	0.0%	0.0%	68.3%	31.7%	0.0%	100.0%
ASWAN	0.0%	0.6%	97.9%	0.0%	0.0%	84.7%	15.3%	0.0%	100.0%
ALEXANDRIA	47.3%	20.4%	11.0%	0.0%	21.2%	100.0%	0.0%	0.0%	100.0%
CAIRO	32.0%	0.0%	1.8%	38.2%	28.0%	100.0%	0.0%	0.0%	100.0%
NEW VALLEY	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
EL ARISH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	54.7%	6.7%	23.6%	4.5%	10.5%	80.1%	19.2%	0.8%	100.0%
UPPER EGYPT	50.9%	0.7%	47.7%	0.0%	0.0%	82.3%	17.6%	0.0%	100.0%
MIDDLE EGYPT	62.7%	12.4%	15.4%	6.7%	2.6%	80.8%	19.0%	0.2%	100.0%
LOWER EGYPT	53.0%	7.0%	16.4%	5.4%	18.1%	79.1%	19.7%	1.2%	100.0%

Source: PBDAC

Annex Table 12.11 EGYPT: PBDAC Nitrogen Sales By Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Nitrogen)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	118564	101292	108859	106458	95474	45793
KAFR EL SHEIK	47094	43982	44467	44680	44532	29901
GHARBIA	43160	47339	48402	48775	44000	23528
DAKAHILA	61064	58179	59250	58190	54574	29880
DAMIETTA	9797	7693	8093	8291	7348	4767
SHARKIA	72372	76330	76451	76290	69905	37669
ISMAILIA	16327	16411	14578	13927	13258	5669
MENOFIA	42609	54629	50766	47955	42383	18364
KALUBIA	21499	27352	27685	27200	23053	10095
GIZA	28450	36681	31252	32636	31153	13683
BENI SUEF	29173	33140	31642	32704	32523	18425
FAYOUM	35140	37613	34715	37370	32439	15772
MINYA	58449	60940	61196	61306	58134	33157
ASSIUT	43619	39752	43049	41761	42231	26622
SOHAG	37651	38630	38671	40483	38174	25827
QENA	69935	69989	68758	70472	67859	50487
ASWAN	25054	23665	22511	24569	23162	20760
ALEXANDRIA	14341	14654	15004	17136	17792	8343
CAIRO	753	1128	1156	1110	1126	461
NEW VALLEY	1417	1593	1401	1509	1658	1471
EL ARISH	569	533	480	536	579	295
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	777037	791525	790388	793358	741357	420970
UPPER EGYPT	176260	172036	172989	177285	171426	123697
MIDDLE EGYPT	172711	195726	186491	191217	177302	91131
LOWER EGYPT	428066	423763	430908	424856	392629	206141
OTHER SALES			0	40940	99820	317980
TOTAL SALES	777037	791525	790388	834298	841177	738950

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional N sales from other organizations occurred from 1990 onwards.

Source PBDAC

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Annex Table 12.12 EGYPT: PBDAC Phosphate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt P2O5)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	29516	31076	28413	28160	31602	21185
KAFR EL SHEIK	11326	11565	11255	11140	13020	8325
GHARBIA	11177	11113	10861	10983	14425	6921
DAKAHILA	16393	16485	15780	14900	19324	9656
DAMIETTA	2787	2833	2790	2403	3125	1918
SHARKIA	16704	16660	17105	15839	20252	9970
ISMAILIA	4512	4602	3979	2595	3054	1268
MENOFIA	12559	14009	12004	11252	11789	3895
KALUBIA	5750	5658	5370	4804	4369	1818
GIZA	6715	7214	6086	5129	4329	1790
BENI SUEF	6898	7102	7287	6002	6131	2756
FAYOUM	7889	7903	7099	6191	5610	2355
MINYA	15247	15713	14969	13178	15806	7100
ASSIUT	8576	8462	8888	7502	9870	4388
SOHAG	6289	6357	6297	5803	7621	4505
GENA	13840	13706	12767	11180	7032	4946
ASWAN	4417	4481	3876	3616	1848	2244
ALEXANDRIA	4092	5049	4690	3915	4758	1764
CAIRO	235	287	256	208	166	116
NEW VALLEY	457	567	500	386	408	388
EL ARISH	26	24	22	20	16	21
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	185407	190866	180290	165206	184556	97330
UPPER EGYPT	33123	33006	31828	28101	26371	16084
MIDDLE EGYPT	42499	43590	40811	35304	36245	15821
LOWER EGYPT	109785	114270	107650	101801	121940	65425
OTHER SALES			1731	4863	2250	27600
TOTAL SALES	185407	190866	180290	170069	186806	124930

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional P2O5 sales from other organizations occurred from 1989 onwards.

Source PBDAC

Annex Table 12.13 EGYPT: PBDAC Total Potassium Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt K2O)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	4764	5034	4439	4630	7536	5772
KAFR EL SHEIK	356	396	304	131	284	948
GHARBIA	1355	1220	1250	1260	812	954
DAKAHILA	2209	2347	2625	1773	957	1068
DAMIETTA	224	159	107	67	39	95
SHARKIA	2571	2784	2774	2199	2794	1473
ISMAILIA	1393	1231	1320	907	1611	932
MENOFIA	1082	1064	988	1074	684	790
KALUBIA	1269	978	782	1020	928	588
GIZA	972	1135	1034	906	1382	911
BENI SUEF	209	220	292	202	220	444
FAYOUM	620	672	416	723	813	214
MINYA	2112	1350	1327	837	900	780
ASSIUT	2448	2044	2354	496	829	711
SOHAG	166	152	228	116	580	1223
QENA	5212	6057	4204	3371	3998	2615
ASWAN	1710	1810	1664	1301	1908	1032
ALEXANDRIA	164	784	886	82	1373	442
CAIRO	21	15	11	44	38	18
NEW VALLEY	6	11	6	14	13	9
EL ARISH	24	29	23	36	16	23
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Annex Table 12.14 EGYPT: PBDAC Urea Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Urea)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	161472	141599	138296	141794	99096	46622
KAFR EL SHEIK	56311	54012	45504	45587	32260	22315
GHARBIA	37450	43018	46792	58118	37080	11138
DAKAHILA	70914	69881	64453	56153	60747	23370
DAMIETTA	11231	9107	8096	9855	8327	3411
SHARKIA	79401	87079	75837	80833	65408	32139
ISMAILIA	6460	7101	2529	3992	5497	1601
MENOFIA	50277	65559	49401	45120	38529	12647
KALUBIA	12755	16235	8872	3587	6046	3018
GIZA	38747	48825	38425	38642	41475	16033
BENI SUEF	44716	49321	40621	43387	38046	22449
FAYOUM	58786	62215	46274	55964	46823	26139
MINYA	80357	84590	71120	75200	76345	37519
ASSIUT	72415	67773	62733	61739	66173	33685
SOHAG	53813	58430	55040	57118	53106	30290
QENA	68769	75478	74209	74910	74688	42976
ASWAN	0	0	0	0	0	0
ALEXANDRIA	14733	14692	5551	4715	2666	1163
CAIRO	523	845	880	935	985	333
NEW VALLEY	3079	3463	3042	3269	3579	3063
EL ARISH	1127	1068	916	924	1026	341
PORT SAID *	0		0	0	0	0
SUEZ *	0		0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	923336	960290	838591	861842	757902	370252
UPPER EGYPT	194996	201680	191982	193767	193967	106951
MIDDLE EGYPT	235362	261185	205312	216780	208735	105158
LOWER EGYPT	492978	497424	441297	451295	355200	158143
OTHER SALES				89000	217000	377000
TOTAL SALES	923336	960290	838591	950842	974902	747252

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional urea sales from other organizations occurred from 1990 onwards.

Source PBDAC

Annex Table 12.15 EGYPT: PBDAC Ammonium Nitrate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study1993

(mt Ammonium Nitrate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	19920	23465	87151	69316	76610	28188
KAFR EL SHEIK	10832	13950	43435	45522	49985	31185
GHARBIA	8183	12622	36199	25851	30664	18367
DAKAHILA	13117	17356	65519	72374	53295	30886
DAMIETTA	2166	2358	7090	6611	5138	4473
SHARKIA	11448	16858	72844	65557	60955	25004
ISMAILIA	3977	5870	34058	30814	27381	9697
MENOFIA	10617	18587	51310	47640	40442	15235
KALUBIA	11924	20378	41184	43414	30875	10631
GIZA	11435	19346	17084	17780	13817	6996
BENI SUEF	13339	19755	37888	37753	44288	23209
FAYOUM	9974	14173	39354	31495	30147	9821
MINYA	17033	24075	83405	78614	66755	45464
ASSIUT	3052	3835	42363	39875	32832	31108
SOHAG	20	29	39858	42415	41006	35468
QENA	0	0	103350	107502	100008	91697
ASWAN	413	622	67198	73339	69140	61970
ALEXANDRIA	8721	11676	26512	35496	38573	17563
CAIRO	0	0	58	51	73	26
NEW VALLEY	0	0	0	0	0	0
EL ARISH	0	0	0	0	0	0
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	156180	224955	895860	871419	811984	496988
UPPER EGYPT	3485	4486	252769	263131	242986	220243
MIDDLE EGYPT	63705	97726	218915	209056	185882	96121
LOWER EGYPT	88990	122742	424176	399232	383116	180624
OTHER SALES			0	0	0	412000
TOTAL SALES	156180	224955	895860	871419	811984	908988

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional AN sales from other organizations occurred from 1990 onwards.

Source PBDAC

Annex Table 12.16 EGYPT: PBDAC CAN Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Calcium Ammonium Nitrate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	51177	38259	0	0	0	0
KAFR EL SHEIK	22753	18606	0	0	0	0
GHARBIA	18852	18461	0	0	0	0
DAKAHILA	43635	36658	0	0	0	0
DAMIETTA	5615	3881	0	0	0	0
SHARKIA	29913	27967	0	0	0	0
ISMAILIA	30290	28384	0	0	0	0
MENOFIA	18776	20872	0	0	0	0
KALUBIA	12040	13065	0	0	0	0
GIZA	409	439	0	0	0	0
BENI SUEF	12697	11939	0	0	0	0
FAYOUM	13165	11878	0	0	0	0
MINYA	47484	42613	0	0	0	0
ASSIUT	29475	23517	0	0	0	0
SOHAG	40922	37880	0	0	0	0
QENA	121592	113772	0	0	0	0
ASWAN	79099	75667	0	0	0	0
ALEXANDRIA	5080	4319	0	0	0	0
CAIRO	44	60	0	0	0	0
NEW VALLEY	0	0	0	0	0	0
EL ARISH	0	0	0	0	0	0
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	583016	528237	0	0	0	0
UPPER EGYPT	271088	250836	0	0	0	0
MIDDLE EGYPT	85795	79934	0	0	0	0
LOWER EGYPT	226133	197467	0	0	0	0
OTHER SALES			0	0	0	0
TOTAL SALES	583016	528237	0	0	0	0

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Source PBDAC

Annex Table 12.17 EGYPT: PBDAC Calcium Nitrate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Calcium Nitrate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	13	10	0	105	353	7283
KAFR EL SHEIK	0	0	85	0	33	6834
GHARBIA	44868	46983	33227	37000	52316	28751
DAKAHILA	50	45	32	89	88	4024
DAMIETTA	0	0	0	0	40	463
SHARKIA	52325	52313	48230	45764	51402	31800
ISMAILIA	0	0	35	0	205	845
MENOFIA	48986	58229	53499	57959	54068	32938
KALUBIA	38466	44632	48455	56622	45402	24403
GIZA	36058	41420	42497	46423	37811	18883
BENI SUEF	458	461	1462	422	810	1308
FAYOUM	0	0	0	0	0	199
MINYA	81	77	0	0	0	0
ASSIUT	0	0	0	20	0	0
SOHAG	0	0	0	0	30	0
QENA	0	0	0	0	0	0
ASWAN	0	0	0	0	0	0
ALEXANDRIA	0	0	0	16	4	0
CAIRO	1853	2732	2548	2145	1721	733
NEW VALLEY	0	0	0	0	0	0
EL ARISH	0	0	0	10	54	24
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	223158	246903	230070	246575	244337	158488
UPPER EGYPT	0	0	0	20	30	0
MIDDLE EGYPT	75063	86591	92414	103467	84023	44793
LOWER EGYPT	148095	160312	137656	143088	160284	113695
OTHER SALES			0	0	0	30000
TOTAL SALES	223158	246903	230070	246575	244337	188488

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Minor additional CN sales from other organizations occurred from 1990 onwards.

Source PBDAC

Annex Table 12.18 EGYPT: PBDAC Ammonium Sulfate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Ammonium Sulfate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	104313	79773	77901	87357	117334	66869
KAFR EL SHEIK	50461	42210	43551	41067	62825	39466
GHARBIA	49997	50084	46606	37116	41560	37843
DAKAHILA	49983	42955	37127	39315	42536	39610
DAMIETTA	10369	7332	9679	7489	8690	7903
SHARKIA	70285	67222	56736	48795	55486	46503
ISMAILIA	12049	11550	9707	8581	7404	7537
MENOFIA	11736	13345	12428	10954	13259	11347
KALUBIA	9137	10142	11151	10827	14036	6614
GIZA	5232	5749	6145	8295	7694	5035
BENI SUEF	312	301	183	163	290	587
FAYOUM	2964	2735	1193	5223	3889	2072
MINYA	3924	3603	2624	1838	3169	3242
ASSIUT	7	6	0	0	3846	3428
SOHAG	0	0	0	0	18	57
QENA	0	0	0	0	0	0
ASWAN	0	0	0	0	0	0
ALEXANDRIA	14767	12842	17327	14921	17687	9340
CAIRO	1024	1444	1634	1605	1854	900
NEW VALLEY	1	1	8	27	57	301
EL ARISH	246	203	284	531	477	652
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	396808	351499	334284	324104	402111	289306
UPPER EGYPT	7	6	0	0	3864	3485
MIDDLE EGYPT	21569	22530	21296	26346	29078	17550
LOWER EGYPT	375231	328963	312988	297758	369169	268271
OTHER SALES			0	0	0	0
TOTAL SALES	396808	351499	334284	324104	402111	289306

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional AS sales from other organizations occurred from 1990 onwards.

Source PBDAC

Annex Table 12.19 EGYPT: Total Superphosphate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Single Superphosphate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	158366	164525	160486	165771	175647	129246
KAFR EL SHEIK	65360	66821	63759	57302	73418	45975
GHARBIA	60051	60009	54876	61914	77641	42937
DAKAHILA	74728	74258	62613	78404	110019	60000
DAMIETTA	17968	18217	18098	15375	19021	12224
SHARKIA	69688	69141	80230	89830	116774	60595
ISMAILIA	29809	30380	26525	17300	20362	8305
MENOFIA	70490	78332	62336	64902	66706	22475
KALUBIA	34161	33614	31604	27810	21308	9875
GIZA	33899	35777	31042	25110	20174	9831
BENI SUEF	41990	43015	40112	34705	35741	14441
FAYOUM	42368	42370	41972	33320	33942	15156
MINYA	76107	76960	69908	76526	97461	44386
ASSIUT	56265	55448	53694	46831	60512	22498
SOHAG	37601	37783	37822	31137	34213	21494
QENA	63034	60954	61017	60451	23518	16374
ASWAN	24936	25003	18582	19284	10319	13266
ALEXANDRIA	27279	33660	31266	26097	26325	11757
CAIRO	1566	1913	1707	1387	1104	774
NEW VALLEY	3047	3780	3330	2572	2718	2585
EL ARISH	173	160	149	131	106	143
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	989586	1012118	951128	936159	1027029	564338
UPPER EGYPT	181837	179187	171115	157703	128562	73632
MIDDLE EGYPT	229025	231735	214638	197471	208626	93689
LOWER EGYPT	578724	601196	565375	580985	689841	397017
OTHER SALES			11540	32420	15000	184000
TOTAL SALES	989586	1012118	951128	968579	1042029	748338

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional SSP sales from other organizations occurred from 1990 onwards.

Source PBDAC

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Annex Table 12.20 EGYPT: PBDAC CSP Sales by Governorate, 1986/87 to 1991/92

IFDC Ferilizer Policy Impact Study 1993

(mt Concentrated Superphosphate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	15218	17014	11561	8785	14014	4794
KAFR EL SHEIK	3610	3972	4511	6787	5353	3809
GHARBIA	5020	5399	7013	4522	7411	1280
DAKAHILA	13139	14050	17035	8372	7522	1748
DAMIETTA	246	268	201	259	726	225
SHARKIA	15424	16421	13520	6305	7297	2347
ISMAILIA	109	120	0	0	0	60
MENOFIA	4937	5904	7076	4045	4755	1397
KALUBIA	1505	1593	1679	1687	3127	899
GIZA	4335	4923	3812	3634	3474	842
BENI SUEF	1561	1721	3388	2124	2052	1574
FAYOUM	3875	4122	2141	3181	1383	218
MINYA	10216	11117	11955	4530	3166	1180
ASSIUT	364	386	2224	1274	2115	2703
SOHAG	1689	1826	1662	3020	6638	3415
QENA	11693	12168	9639	5632	9346	6641
ASWAN	1805	1948	2904	1928	800	678
ALEXANDRIA	0	0	0	0	2159	0
CAIRO	0	0	0	0	0	0
NEW VALLEY	0	0	0	0	0	1
EL ARISH	0	0	0	0	0	0
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	94747	102952	100321	66085	81338	33811
UPPER EGYPT	15551	16328	16429	11854	18899	13437
MIDDLE EGYPT	21492	23477	22975	15156	13202	4713
LOWER EGYPT	57703	63147	60917	39075	49237	15661
OTHER SALES			0	0	0	0
TOTAL SALES	94747	102952	100321	66085	81338	33811

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Note: Additional CSP sales from other organizations occurred from 1990 onwards.

Source PBDAC

Annex Table 12.21 EGYPT: Triple Superphosphate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Impact Study 1993

(mt Triple Superphosphate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	118	39	0	0	0	0
KAFR EL SHEIK	367	119	0	0	0	0
GHARBIA	624	198	0	0	0	0
DAKAHILA	558	176	0	0	0	0
DAMIETTA	0	0	0	0	0	0
SHARKIA	949	298	0	0	0	0
ISMAILIA	0	0	0	0	0	0
MENOFIA	292	103	0	0	0	0
KALUBIA	134	42	0	0	0	0
GIZA	9	3	0	0	0	0
BENI SUEF	31	10	0	0	0	0
FAYOUM	13	4	0	0	0	0
MINYA	0	0	0	0	0	0
ASSIUT	0	0	0	0	0	0
SOHAG	34	11	0	0	0	0
QENA	0	0	0	0	0	0
ASWAN	0	0	0	0	0	0
ALEXANDRIA	0	0	0	0	0	0
CAIRO	0	0	0	0	0	0
NEW VALLEY	0	0	0	0	0	0
EL ARISH	0	0	0	0	0	0
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	3129	1003	0	0	0	0
UPPER EGYPT	34	11	0	0	0	0
MIDDLE EGYPT	187	59	0	0	0	0
LOWER EGYPT	2908	933	0	0	0	0
OTHER SALES			0	0	0	0
TOTAL SALES	3129	1003	0	0	0	0

* NOTE: Port Said, Suez and South Sinai included in Cairo data

Source PBDAC

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Annex Table 12.22 EGYPT: PBDAC Potassium Sulfate Sales by Governorate, 1986/87 to 1991/92

IFDC Fertilizer Policy Study 1993

(mt Potassium Sulfate)

GOVERNORATE	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
BEHEIRA	9925	10488	9247	9646	15700	12026
KAFR EL SHEIK	742	825	634	273	592	1974
GHARBIA	2823	2542	2604	2624	1692	1988
DAKAHILA	4602	4890	5469	3694	1993	2224
DAMIETTA	467	331	223	139	82	198
SHARKIA	5356	5800	5779	4581	5820	3069
ISMAILIA	2902	2565	2750	1889	3357	1941
MENOFIA	2254	2217	2059	2238	1425	1646
KALUBIA	2644	2038	1630	2125	1933	1226
GIZA	2025	2365	2154	1887	2879	1898
BENI SUEF	435	458	608	421	458	926
FAYOUM	1292	1400	867	1507	1693	445
MINYA	4400	2813	2764	1744	1876	1626
ASSIUT	5100	4258	4904	1034	1723	1481
SOHAG	346	317	476	242	1208	2547
QENA	10858	12619	8758	7023	8330	5448
ASWAN	3563	3771	3466	2711	3974	2149
ALEXANDRIA	342	1633	1646	170	2860	921
CAIRO	44	31	23	91	79	38
NEW VALLEY	13	23	13	29	27	19
EL ARISH	50	60	48	75	34	47
PORT SAID *	0	0	0	0	0	0
SUEZ *	0	0	0	0	0	0
SOUTH SINAI *	0	0	0	0	0	0
TOTAL	60181	61442	56322	44143	57740	43837
UPPER EGYPT	19867	20965	17604	11010	15240	11625
MIDDLE EGYPT	10796	9073	8023	7684	8839	6121
LOWER EGYPT	29519	31404	30695	25449	33661	26091
OTHER SALES			0	0	0	0
TOTAL SALES	60181	61442	56322	44143	57740	43837

* NOTE:Port Said,Suez and South Sinai included in Cairo data

Source PBDAC

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TERMS OF REFERENCE

IMPACT OF POLICY REFORM IN EGYPT ON MARKETING, PRICING, AND UTILIZATION OF FERTILIZERS AND AGRICULTURAL CHEMICALS

PROJECT PROPOSAL RESPONSE TO SCOPE OF WORK (SOW) PREPARED BY GOE/USAID PRESENTED BY THE INTERNATIONAL FERTILIZER DEVELOPMENT CENTER, MUSCLE SHOALS, ALABAMA, USA

1. BACKGROUND

The orderly transition to a market-orientated fertilizer and agri-inputs distribution and marketing system with a minimal disruption to agricultural production is an objective of the Government of Egypt (GOE) which has been pursued through policy reform and implementation since 1987. The most important policy reforms in the fertilizer subsector implemented under the APCP policy reform program have been:

1. Gradual elimination of fertilizer subsidies by 1993.

2. Granting of unsubsidized cash credit in lieu of credit in-kind.

3. Gradually opening the retailing, wholesaling, and importation of fertilizers to the private sector and cooperatives.

4. The adjustment of marketing margins toward commercial levels by the Principal Bank for Development and Agricultural Credit (PBDAC).

5. Setting ex-factory fertilizer prices equal to border prices by 1993.

These important reforms of a system, which was highly regulated and subsidized and under the virtual monopoly control of PBDAC and direction of the Ministry of Agriculture (MOA), have also been matched by decontrol of all major agricultural production and pricing except for cotton, providing farmers with a greater degree of freedom in farm operating decisions. Recent land reforms,

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including elimination of rent control over the next five years, have also been applied which will impact on the structure, output and profitability of the agricultural sector.

Implementation of open, competitive market reforms leading to a market needs responsive marketing system and efficiency improvements in resource allocation and operation requires a policy framework addressed at both macro and micro levels and a support and regulatory framework designed to facilitate a market orientated system. In Egypt the policy reform program agreement period to 1992-93 includes a pilot effort by PBDAC with 106 cooperatives in three governorates to test the feasibility of divesting at least some retail and wholesale activities to cooperatives, direct sales of fertilizer from factories to agents and merchants, and a pilot project by PBDAC to transfer retail fertilizer marketing to the private sector. Under current agreements PBDAC will retain control over 50% of total fertilizer marketed beyond 1992-93. Such control and a reported distrust by farmers of the private sector compared to the cooperative sector[1] can be expected to profoundly influence the rate of liberalization of the industry and the potential for development of the private sector and a market responsive system.

Several fertilizer marketing studies have been completed in recent years, including a privatization study, an in-depth analysis of the entire fertilizer industry as it pertains to Upper Egypt, a feasibility analysis of the planned expansion of a domestic fertilizer plant, and a study of the capacity, capability, and legal structure of the cooperative system to supply agri-inputs and market farm outputs. PBDAC is completing a study of storage facilities for fertilizer and other agri-inputs and under APAC with U/AES a survey is currently being conducted of agri-inputs wholesalers and retailers in the private and cooperative sectors which includes specific reference to changes in the fertilizer marketing system and the role of PBDAC. Sufficient data and information is therefore available to assess the impact of policy reform to date on the marketing and pricing of fertilizers and agricultural chemicals and to develop a comprehensive plan document to facilitate the orderly transition to a market-orientated fertilizer and other agri-input supply/marketing system.

The Scope of Work (SOW) prepared by PBDAC and USAID, Cairo, which was received by IFDC in October, 1992, requests the preparation of detailed demand forecasts for fertilizers and agrichemicals through the year 2010. Such forecasts prepared from econometric models or time series analysis cannot provide accurate estimates of future demand in the significantly changed policy environment and market organization structure. The historical input/output factors under the previously planned allocative distribution system operated by PBDAC will not provide a guide to future supply/demand relationships. While provision is made in this proposal for some limited quantitative and qualitative product demand forecasts significant effort will be placed on recommendations for a Management Information System to monitor and provide timely information on all relevant aspects of the fertilizer and agrichemical subsectors operating in an open competitive market system. Such an MIS system will be be far more relevant to the PBDAC divestiture and national planners and policy decision makers.

II. OBJECTIVES

The overall objective of the study is to develop a practical time framed implementation schedule of recommendations designed to address the major policy and intervention issues related to the cost efficient privatization and liberalization of fertilizer and agricultural chemicals marketing, distribution, and import procurement. Where appropriate, options and alternate approaches for implementing market liberalization and privatization of PBDAC marketing facilities via direct interventions will be discussed and quantified.

An assessment of the macro and micro level impacts of fertilizer sector policy reforms implemented to date and proposed for implementation, and of the pilot projects being conducted by PBDAC with the cooperative and private sectors will be an integral part of the study and the development of recommendations, as will be the design of the divestiture plan for PBDAC currently being developed by PBDAC with assistance from the APCP.

The thrust of the study will be the provision of guidance and the recommendation of options to assist PBDAC and GOE in implementing future market liberalization and privatization of PBDAC marketing facilities.

III. EXPECTED OUTPUTS FROM THE STUDY

The main outputs from the study will include:

1. A critical assessment of fertilizer and agri-chemicals subsector developments over the past 5 years. Included will be a review and appraisal of the fertilizer and pesticide supply and marketing system with specific focus on:-

   (a) policy development
   (b) use trends
   (c) crop/input price relationships and farm incomes
   (d) fertilizer and pesticide control legislation
   (e) the credit system to support agriculture and the fertilizer subsector
   (f) the capacity and capability of the cooperative sector to operate in an open competitive market system
   (g) the structure, capacity, and capability of the private sector to operate in an open competitive market system
   (h) the adequacy and appropriateness of fertilizer and agri-chemical warehouse and storage facilities within the public, cooperative, and private sectors
   (i) the development and transfer of appropriate fertilizer and agri-chemical technology to farmers
   (j) marketing margins and costs at each level of the marketing chain

2. A critical assessment of the PBDAC pilot projects for transfer of fertilizer marketing to cooperatives and the private sector including the identification of constraints to cost efficient open competitive marketing and the development of recommendations for overcoming these constraints.

3. A critical assessment of the mechanisms and operation of fertilizer and agri-chemical procurement from domestic sources and imports including the direct sales of fertilizer from factories to agents and merchants and the capacity, capability, and constraints of the private and cooperative sectors to import fertilizers.

4. A critical assessment of the PBDAC fertilizer marketing divestment plans with particular focus on the sale of assets, options with regard to staff, and timing of divestitures.

5. An assessment of the distribution and farm production credit needs of the newly liberalizing fertilizer and agri-chemicals market and an assessment of the current PBDAC and Commercial Banks credit instruments and facilities to meet those needs.

6. A coordinated identification of constraints within the present marketing system and planned divestiture of PBDAC marketing operations for each marketing function with focus on legislation, macroeconomic, fiscal, pricing, organizational and anti-trust policies and regulatory interventions in the areas of credit, quality control, storage, research and extension, and information management and dissemination.

7. Recommendations to facilitate a continuation of the orderly development of the private and cooperative sectors in fertilizer and agrichemical marketing. Key areas will be in (a) policy development, (b) human resource development, (c) the disposition of GOE-held assets, (d) credit system development, and technology transfer. Specific attention will be given to recommendations for a national fertilizer management information system that can provide a timely and reasonably accurate assessment of supply, farm level use, and demand for fertilizers and agrichemicals to be used for policy analysis and sector planning.

IV. SPECIFIC TERMS OF REFERENCE

The above output will include activities in the following areas:

Agronomic Analysis

1) Review and evaluate the agronomic and economic aspects of fertilizer product use and agrichemical use by major crop and by region where data permits.
2) Evaluate the impact of subsidy removal on fertilizer and agrichemicals use by farmers.

3) Assess observed and anticipated changes in use by amount and type of fertilizer and agrichemical product.
4) Review fertilizer response functions for major crops and review and evaluate relevant research findings on the response of major crops to types and levels of fertilizer use under specific conditions.
5) Identify the most agronomically and economically appropriate fertilizer and chemical products for major crops under existing or adjusted crop production conditions.
6) Identify additional research which may be required to provide the basis for selecting fertilizers and agrichemicals for Egyptian agricultural conditions.
7) Describe and evaluate the capacity of the research and extension system in the public and private sectors to produce new technology in the coming decade and transfer it effectively to farmers.
8) Assess farm-level use of fertigation, chemigation, micro nutrients and NPK compounds and blends, and comment on future development of these products.
9) Determine the most appropriate use of potassium sulfate in the farming systems of Egypt and identify from existing research and knowledge the opportunities for the most economical and technically appropriate supply of potassium fertilizer.
10) Review current plans and make recommendations for technology transfer to farmers in the areas of fertilizer use efficiency and appropriate and safe use of agrichemicals. Assess the requirements of the public, private, and cooperative sectors for fulfilling appropriate technology transfer to farmers.

Economic and Policy Analysis

1) Describe and analyze the social, political, and macro-economic factors which affect the level of agricultural technology in general and the use of fertilizer and agrichemical products in particular for the major crops.
2) Utilizing existing data, determine cost and demand functions for use on selected major crops at recommended application rates.
3) Using existing crop response functions and current prices, estimate optimum fertilizer use for selected major crops and compare to existing recommendations.

4) Determine and analyze historical trends in fertilizer use by product and nutrient, by crop and by region for the period 1975-91. Accurate data on actual cropwise use is limited and the analysis will be restricted to apparent(or planned) use. Determine trends in agrichemicals use to the extent that data is available.

5) Assess the changes expected in farm-level prices for the major crops under the newly liberalized crop marketing system and assess the impact of unsubsidized fertilizer prices on farm use and demand using existing crop response functions.

6) Identify and analyze demand related constraints to expanded product use and recommend remedial actions.

7) Review the policy and regulatory changes in the agricultural sector and fertilizer subsector since 1987.

8) Assess the policy and regulatory environment conducive to privatization/liberalization, focusing on macro-economic, fiscal, trade, financial, organizational and anti-trust policies.

9) Assess the support and regulatory environment conducive to open competitive marketing focusing on distribution and farm production credit,quality control, research and extension, and information management and dissemination.

10) Develop the framework for a management information system(MIS) to provide policymakers and decisionmakers accurate and timely information and analyses relative to the fertilizer, agrichemicals, and crop markets. The basic methodologies will be identified. Included will be:

    (a) Primary functions of the MIS.
    (b) Monitoring reports to be prepared.
    (c) Structure of the automated MIS.
    (d) MIS software requirements.
    (e) Data requirements.
    (f) Physical facilities and equipment requirements
    (g) Staffing requirements/training needs.
    (h) An indicative budget
    (i) Institutional linkages.

11) Develop alternative policy scenarios and assess the impact of each on trends in output, use and price of fertilizer and agrichemicals; recommend a time-framed policy and regulatory implementation program designed to

promote and support the orderly transition to an open competitive fertilizer and agrichemicals market in the most cost effective way.

Marketing System Analysis

1) Describe the structural changes in the fertilizer and agrichemicals marketing system that have taken place since 1987.
2) Describe and appraise PBDAC's strategy under the pilot program, including pricing, allocation criteria, credit policies, selection of eligible cooperatives and private firms, and regional demarcation.
3) Assess the financial outcome of participating firms and cooperatives and assess the quality of services provided.
4) Assess farmer's degree of satisfaction with marketing services and prices under the pilot scheme.
5) Determine the degree of competition that arose among cooperatives, private firms and PBDAC.
6) Recommend modifications to the pilot program as appropriate.
7) Describe and assess the existing private sector firms which could play a role in fertilizer and agrichemicals marketing utilizing data from the PBDAC pilot program and the APAC-U/AES survey of fertilizer and agrichemical distributors and retailers. Specifically develop a profile of small, medium, and large firm that function at the village,district,and national level quantifying numbers, capacities, capabilities, financial and physical resources and disposition to use PBDAC for credit to the extent data is available.
8) Analyze marketing margins and costs at each level of the existing marketing system. Compare and contrast PBDAC's real costs and margins for fertilizers and agrichemicals with those of cooperatives and private sector firms on a size classified basis. Analyze the efficiency of pricing systems ex-factory and at wholesale and retail levels.
9) Assess the current competitive situation at each level of the marketing system within and between the private sector and the cooperative and PBDAC system.
10) Quantify and assess the efficiency of the direct sale of fertilizer from the factories to the private and cooperative sector.
11) Assess the adequacy of current and proposed storage capacity for fertilizers and agrichemicals at all levels and in all sectors of the marketing

system based on data and information made available from the 1992 PBDAC study and the APAC-U/AES survey of fertilizer dealers. Assess the impact of market liberalization/privatization on storage requirements at factories and regional godowns and on distribution costs. Specifically examine PBDAC's plans for divesting itself of storage facilities currently under construction. Examine the regulatory conditions governing construction of storage space by the private sector.

12) Recommend a time phased program for facilitating a more cost efficient open competitive marketing system and divestiture by PBDAC of its fertilizer and agrichemical marketing functions.

Cooperatives and Credit

1) Review the Agricultural Cooperative Assessment for Egypt study prepared for USAID in 1990 and assess the role of cooperatives, present and potential, in the marketing of fertilizer and agrichemicals as PBDAC withdraws from input marketing and trade is opened to the private sector. Compare and contrast the operation of cooperatives in the PBDAC pilot program with cooperatives in other governorates and quantify and assess the achievements of the pilot program.
2) Assess the capacity and capability of the cooperatives financially, managerially, and structurally to develop and maintain agri-input marketing services for members in competition with private sector firms in a competitive market.
3) Assess the credit needs of cooperatives for marketing fertilizer and agrichemicals, currently and after complete liberalization of fertilizer marketing.
4) Identify constraints to cooperatives preventing them fulfilling a needs based market responsive role in agri-input marketing and recommend policy and regulatory changes, if required, to assist their transition to competitive market organizations.
5) Assess the role of credit in the newly liberalizing market for fertilizers and agrichemicals, quantifying total distribution credit for private and cooperative sectors.
6) Determine if the credit instruments and facilities of PBDAC and Commercial Banks are adequately designed to meet the needs of cooperatives and the private sector in the marketing of agri-inputs.

7) Assess the capital conditions of PBDAC and compare to estimated credit requirements for fertilizer and other inputs. Develop recommendations for addressing perceived gaps in the supply and demand for credit and the special requirements for private sector importation of fertilizers and agrichemicals.

VI. STUDY IMPLEMENTATION AND DELIVERABLES

The study will be conducted by a four person study team from the International Fertilizer Development Center, Muscle Shoals, Alabama, USA, supported by four Egyptian experts and two local support staff, and will form part of the PBDAC Private Sector Outreach Program. The Study Team, under the guidance of the Team Leader, will keep in close consultation with senior officers of PBDAC and USAID, Cairo throughout the implementation of the study. The study will be completed during an eleven week period commencing in the first quarter of 1993 and not later than two(2) months after USAID's approval of the project as recorded in a signed contract between USAID and IFDC.

An initial time-framed schedule of work is presented in Table 1. Study Team members will visit relevant organizations, government departments and agencies, and firms in Cairo and make field visits to the PBDAC pilot areas in three governorates as well as fertilizer production factories and other locations relevant to the study.

At the end of the first week the study team is together, the Team Leader will deliver a time-phased implementation plan and prepare a revised scope of work for review by PBDAC, U/AES, and USAID, Cairo based on prior discussions with these parties.

A Draft Study Report will be presented to USAID (3 copies), PBDAC (3 copies), and U/AES (1 copy) at the end of the 8th team-week. The Team Leader will call a review meeting with USAID, PBDAC, and U/AES during the 9th week , where the draft report will be discussed. The Final Report will be submitted to USAID (12 copies), PBDAC (3 copies), and U/AES (1 copy) by the end of the 11th week or before the Team Leader departs Egypt.