PN-ABD-745

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PN-ABL-745
ISN 63565

PRIVATIZATION OF INPUT SUPPLY ACTIVITIES OF THE PRINCIPAL BANK FOR DEVELOPMENT AND AGRICULTURAL CREDIT

(PBDAC)

ARAB REPUBLIC OF EGYPT

VOLUME 1

Report by

The Aries Group, Ltd.
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WASHINGTON, D.C. 20006

Project No. 104

April 1989

Prepared for the
BUREAU FOR PRIVATE ENTERPRISE
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

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The materials in this volume are supplemented and amplified by the following annexes contained in Volume 2:

Annex A:	Fertilizer Sector Review.
Annex B:	Privatization of Agricultural Inputs: Economic Effects of the Removal of Subsidies and the Application of World Prices.
Annex C:	Report of Sociological Assessments of Input Privatization.
Annex D:	Financial Analyses of PBDAC: Income and Expense Statements (Tables D-1 through D-36).
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The authors express their thanks to the management and staff of the Ministry of Agriculture, the Principal Bank for Development and Agricultural Credit, and the MISR Iran Development Bank for their cooperation and assistance in the preparation of this study.

ABBREVIATIONS

Organizations and Government Agencies

PBDAC	The Principal Bank for Development and Agricultural Credit
GOE	Government of Egypt
MOA	Ministry of Agriculture
MOE	Ministry of Economy
MOF	Ministry of Finance
MOI	Ministry of Industry
MOS	Ministry of Supply
MOT	Ministry of Transport
ARC	Agricultural Research Center
CIO	Chemical Industries Organization
GAASF	General Authority for Agriculture Price Stabilization Fund
GOFI	General Organization for Industry
NRC	National Research Center

Fertilizer Terms

N	Nitrogen	
P205	Phosphorous Pentoxide	
K20	Potassium Oxide	
CN	Calcium Nitrate	(containing 15.5% N)
AN	Ammonium Nitrate	(containing 33.5% N)
CAN	Cal Ammonium Nitrate	(containing 31% N)
AS	Ammonium Sulfate	(containing 20.5% N)
U	Urea	(containing 46% N)
SSP	Single Superphosphate	(containing 15% P205)
DSP	Double Superphosphate	(containing 37.5% P205)
	(DSP is used to denote domestic TSP)	
TSP	Triple Superphosphate	(containing 44-46% P205)
PS	Potassium Sulfate	(containing 48% K20)
NPK	Mixed Fertilizers	(containing N, P205, & K20)

EXECUTIVE SUMMARY

1. The basic premise of this study is that the Government of Egypt supports the privatization of the agricultural production input activities of the Principal Bank for Development and Agricultural Credit (PBDAC). Government does so in order to achieve the efficiencies and economies that can be obtained only through competitive private activity in this field. Divestiture of these activities to a private or public monopoly would serve only the purpose of permitting PBDAC to concentrate on its banking and credit activities; it would fail to afford the advantages attainable through competitive private enterprise subject only to necessary public regulation in the public interest. Therefore divestiture may be considered, if at all, as an intermediate step towards privatization.

2. Special features of PBDAC's situation in input distribution are significant for the study: (a) the transfer of PBDAC's physical inputs is not a principal issue; The privatization of these storage facilities assume importance if, and only if, in specific locations the private sector does not ban or is unable to acquire such facilities. (b) owing to the absence of competition it is impossible to measure the efficiency and effectiveness of PBDAC's input activities; and (c) the involvement of the private sector in input distribution is severely inhibited. These latter inhibitions derive principally from: (a) the subsidization of inputs distributed by PBDAC; (b) the dominant position of PBDAC in providing credit, largely in kind, to farmers; and (c) the very existence of a large parastatal in the field.

3. Notwithstanding, private firms are currently, and some heavily, involved in the distribution of agricultural production inputs. This involvement varies in form and degree among the several input categories. Private sector involvement in the fertilizer business is perhaps least significant despite the facts that private firms are now permitted to import and distribute fertilizers and that a thriving black market exists in the sale of fertilizer supplies which are treated by farmers as surplus within their quota allotments. Legitimate private distribution of fertilizer is limited essentially to specialty fertilizer products (foliar and drip irrigation items). Otherwise, the importation, domestic procurement, and distribution of fertilizer belong to PBDAC. The importation, manufacture, and sale of new jute bags is wholly in the hands of the government, with PBDAC serving as the exclusive distributor.

4. Despite the fact that Egypt itself produces none of the ingredients of agricultural chemicals (pesticides), the role of the Ministry of Agriculture is dominant in assaying and approving ingredients and formulations for use in Egypt and in deciding about their importation and sale. The largest use of pesticides for field crops is for cotton, under arrangements determined and

administered by the Ministry of Agriculture. PBDAC serves the Ministry as an agent in the importation, storage, and distribution to facilities for applying pesticides to production areas designated for cotton production by the Ministry. Private firms distribute pesticides primarily for horticultural crops, through PBDAC on a contingency basis and directly, accounting for perhaps 15 percent of total usage of this input class.

5. The Ministry of Agriculture presently has responsibility for the production of breeder and foundation seed for field crops as well as for the production of practically all certified and registered seed for such crops. Private firms, with recent encouragement from PBDAC, have begun to move into the distribution, directly and through PBDAC as contingency agent, of maize seed, primarily hybrid varieties. Private firms, however, are the dominant suppliers, directly and through PBDAC, of horticultural seeds. If the private sector is to enlarge its place and become an alternative to PBDAC in supplying field crop seed, it must be free to produce certified and registered seed as well as to engage in their distribution.

6. The activity of PBDAC appears very great in supplying agricultural machinery and equipment as well as in providing credit for equipment purchases. PBDAC provides no after-sales service and has only limited facilities for the display of equipment for sale. In spite of its identification as an important supplier, PBDAC is essentially a consignment agent for private and public manufacturers and importers. Its large turnover is explained in terms of the availability of credit for purchases by agricultural producers.

7. PBDAC is active in supplying large animal feed, essentially for milk and meat production. Except in supplying certain ingredients for poultry feed, the production and distribution of feed for small animals are divided about equally between one public and several quite large private firms. The governmental position in the production of large animal feed is dominant. PBDAC serves as an agent in procuring and distributing principal ingredients for feed producers. Its role in distributing feed for large animals is confined to feed used in connection with special governmental programs and the requirements of governmental agencies, both in accordance with quotas set by the Ministry of Agriculture. Many of the recipients of PBDAC's large animal feed have resources that would readily permit them to obtain their feed supplies directly from factories.

8. Spokesmen of private firms emphasize, with respect to their assumption of a major role in input distribution, the importance of three conditions for increased private activity in the field: (a) that governmental policies affecting private firms be clear, durable, reliable, and consistently applied; (b) that the government maintain a level playing field, with equal conditions

for both private and public sector organizations; and (c) that privatization proceed gradually, allowing time for private firms to develop outlets and facilities for the distribution of inputs.

9. There is sufficient evidence that the private sector is ready, willing and able to take over or play a major role in the distribution activities presently under the jurisdiction of PBDAC.It is assumed that the government is truly interested in successful privatization, will help private firms to establish themselves in this field and to do so within a reasonable time span, typically no less than three years for some inputs and as much as seven or eight years in the case of the largest input category, fertilizer. Thus, privatization will proceed gradually, with approach and timing adjusted to the special circumstances characterizing each input class. The privatization options considered and selected as those to be preferred assume the gradual elimination of subsidies and possibly the removal of controlled output prices in favor of world prices so as to limit if not eliminate adverse effects on farmers.

10. The longest period for the attainment of full privatization is for fertilizer, the largest and most important input category and the one where the government monopoly is most pervasive. The consultant teams's preferred option for fertilizer calls for the initiation of privatization by allocating 15 percent of total supply to the private sector for distribution. However, if government is of the opinion that an across-the-board reduction of quotas would cause undue hardship to the small farmers or would be politically unacceptable, the following three alternatives, which may be locally more acceptable, may be considered:

1. Maintaining the fertilizer allocations for the major field crops (sugarcane, wheat, maize, cotton, rice, sorghum) and reducing or eliminating allocations for others. The unallocated fertilizer would be sold by the private sector and PBDAC at free market prices.

2. Allocating to the private sector that portion represented by fertilizer for horticultural crops.

3. Postponing the removal of fertilizer allocations and PBDAC's withdrawal from the distribution of allocations until subsidies have been removed (1992-3) and encouraging the private sector to import and distribute fertilizer beyond allocations until that time. Once subsidies have been removed, PBDAC's sale would be reduced by half a million tons a year to be sold by the private sector.

The last of these alternatives is the softest, and would in effect defer the start of active private distribution of fertilizer for some four or five years.

11. In the case of seed, a shorter period of privatization is seen as appropriate. Privatization, as in all input classes, would be initiated by a government declaration of its intention to proceed with privatization. Initial privatization experience would be extended from white maize seed, already partly privatized, to include seed for additional field crops year by year, with seed for controlled crops reserved for privatization late in the process. The privatization of seed requires that the private sector's role in the production of registered and certified seed be expanded, leaving the Ministry of Agriculture responsible primarily for producing breeder and foundation seed and assaying and approving varieties and controlling labelling and packaging.

12. With respect to pesticides, again, the position of government is dominant. Government properly evaluates the safety, efficacy, and environmental effects of agricultural chemicals. Its activities now extend far beyond that level to include control over the importation and distribution of all individual ingredients and products. The Ministry of Agriculture is extensively involved in the procurement and distribution of pesticides for cotton and their application. Privatization of pesticide distribution would begin with the discontinuance of consignment distribution of horticultural pesticides by PBDAC. It would proceed then to admit private sector firms to compete for all non-cotton pesticides equally with public sector firms. The final stage of privatization, expected in the fifth year of the process, would take place with the discontinuance of PBDAC delivery, storage, and distribution of cotton pesticides.

13. A three-year phase-out of PBDAC's involvement in the distribution of agricultural machinery and equipment is recommended. This process would begin with the encouragement of private importers and domestic producers of equipment to develop dealer-service networks for themselves. This would be followed by discontinuing the importation, distribution, and sale of equipment by PBDAC, with the exception of tractors and irrigation sets. These latter categories would be privatized last, within two years following the end of public sector importation and sale of other equipment types.

14. The preferred option for animal feed envisions the discontinuance of PBDAC distribution of non-traditional feed as a first step, together with the requirement that public sector recipients pick up their own feed from PBDAC or producers. Recipients of traditional feed through PBDAC would be phased out of PBDAC's distribution system by one third in the next following year, by a further one third in the succeeding year, and completely in the third or fourth year of privatization. Manufacturers would then sell feed directly to the end users and traders.

15. The governmental monopoly over the importation, manufacture,

and initial sale of jute bags is complete. The privatization of this input area would therefore have to begin with the authorization of private manufacture, importation, and sale of jute bags. As the local industry is now very small, this phase of privatization would be modest in the initial years, during which private capabilities and facilities are developed, proceeding to full privatization of these activities in the fifth year.

16. With the exception of fertilizer and jute bags, where the governmental monopoly is very nearly complete, other but less desirable options would typically begin with the government's announcement of its intention to proceed with privatization, with initial steps moving forward on a governorate by governorate basis, rather than nation-wide.

17. It is unrealistic to draw up a tight schedule for privatization. Even assuming the government's full cooperation in privatization, the extent of the private sector's interest and involvement will depend on many factors, some of which are impossible to foresee at this time. It is only after the process has begun and an interim evaluation of the degree of success with privatization has been made that the future course of action can be charted in detail.

18. The general organizational structure and functional assignments within PBDAC seem suitably related in general to its responsibilities in the distribution of inputs. The distinction made between the General Departments of Inputs and Commercial Affairs is an artificial one, and consideration might be given to consolidating the two general departments.

19. The privatization of PBDAC's input supply and associated overhead activities will affect employees in an estimated 16,500 authorized positions. With full privatization, these employments will become surplus to the needs of input distribution except as PBDAC employees may find employment in private sector input supply firms. Immediately, therefore, PBDAC should adopt a no-hire policy and consider encouragement of early retirements and other separations as well as retraining for staff likely to be surplus. The effects of such measures can only be estimated, and it is possible that no more than one third of the 16,500 may be separated through attrition and induced separations. Thus, PBDAC may have some 11,000 regular employees additional to its future needs, save as these may be absorbed by the organization's banking activities.

20. The financial effects upon PBDAC of privatization may be summarized in the following terms. If PBDAC's non-banking activities are all phased out linearly over five years, the total income from them will gradually drop to zero. Most non-personnel costs associated with these activities (e.g. financing, transport) will decrease proportionately. If the number of PBDAC employees engaged in non-banking functions decreases linearly over five years

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from the present estimated number of 16,500 to 11,000, the phasing out of non-banking activities will cause PBDAC to forego the following net income in comparison with the financial results of 1987-8:

Year	Year 1	Year 2	Year 3	Year 4	Year 5
		(LE Million)			
Net income foregone	21.4	42.8	64.1	85.6	106.9

However, the net financial effect on PBDAC will be considerably smaller than the above numbers suggest, since most of PBDAC's profits (80% in 1987-8) go to the Government of Egypt, either as commercial profit tax or dividends. Removal of subsidies, however, would save the government a minimum of about LE 317 million. The future credit activity of PBDAC is presently the subject of an indepth study. It is expected that this study will make specific recommendations with regards tot he loan portfolio of PBDAC as privatization of inputs proceeds. The result of this study would make it possible to arrive t more accurate estimates of the effects of privatizations of inputs and the new lending operation on the financial statements of PBDAC.

21. Removal of subsidies, as envisioned by the recommendations of this report, will have adverse effects upon the average gross margins of farmers, ranging between 9.3 per cent and 13.6 percent, with an average of 11.3 percent. This range is reduced to between 4.3 and 8.1 percent with the removal of subsidies for all crops except cotton. With an increase in fertilizer and cotton pest control costs to Shadow Farm Gate Prices (SFGP)[1] and a corresponding adjustment of cotton, wheat, rice, maize, sugarcane, and sorghum prices to the shadow prices, however, the resulting average gross margins increase by 56.6 percent, with a range from 13.5 percent to 79 percent. If input and crop prices of all crops in the rotations examined are adjusted to the shadow prices and cotton remained constant, the average decrease in gross margins for farmers would be 6.5 percent. A slight increase in cotton prices to farmers, however, would offset this reduction, and leave farmers better off financially than they are now.

22. Nevertheless, farmers are widely uncertain about privatization's effects upon them, an uncertainty that stems in part from their habit of looking to government for assistance and control and from a heritage of bad experiences with unscrupulous merchants.

23. During the closing weeks of this study the project team has met with responsible officials of PBDAC regarding the substance

[1]International prices of commodities at the border adjusted by costs associated with bringing the goods to the farm.

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and effects of privatization recommendations. These meetings have revealated a general official acceptance of "privatization" at least to the extent of divesting PBDAC of its input activities and creating one or several successor enterprises that would, somehow, become in time a part of a competetive private environment for the distribution of agriculture inputs. There apprears to be an official acceptance, in principle at least, of recommendations of this report regarding the privatization of pesticides, agriculture machinery, and large animal feed. In the case of agricultural machinery the officials of PBDAC expressed the view that privatization could proceed faster than recommended. With regard to animal feed they are of the view that the production of traditional feed should decrease and non-traditional feed increase. They believe that with this development it would be possible to remove the present allocation system and the feed mills could sell their products as they do now with non-traditional feed. This may not occur because feed is in short supply and non-traditional feed in also subsidized. Official reservations about privatizing seed distribution appear to center on the rate at which private sector firms will proceed to develop nation-wide distribution networks.

24. Official preference for fertilizer privatization, moved evidently by concern that small farmers continue to receive their requirements, is that quotas for farmers and PBDAC distribution be maintained until subsidies have been removed and domestic production capabilities enlarged; probably about 1992-3. Substantial private distribution of fertilizer would begin at that time and would continue progressively over the next four or five years to full privatization. This preference is accommodated by project recommendations, though not as a first preference.

25. The deepest official concerns over the possible departure of government from the input supply business appear to center on two possibilities. First, that the absence of government from the distribution scene will leave farmers, and especially small farmers, exposed to possible exploitation by unscrupulous dealers. And, second, that the demise of PBDAC as supplier may leave many present employees of the organization without assured, stable employment. As to the first concern, the team's recommendations have at several points in this report emphasized the need for a continued governmental role in regulating private sector behavior in the supply of inputs. As to the second, the consultant can only emphasize that it has no authority to commit the Government of Egypt to large expenditures in ameliorating possible unemployment or in requiring private firms to engage the services of employees of PBDAC who may be displaced by privatization. Alternative solutions to the important problem of redundancy should be the subject of a separate in-depth study.

26. Negotiation with the World Bank for a substantial investment in the improvement of PBDAC's storage facilities are in an advances stage. It is the consultant's view that the execution of this

project would inevitably inhib and at the minimum slow down progress towards the privatization of the inputs.

I. RATIONALE FOR THE STUDY

Introduction

1. After about two decades of rigid, extensive, and centralized controls of the nation's economy by government, in the mid 1970's a change in policy allowing greater participation of the private sector was initiated. It is reflected in the Open Door Policy, which allows greater scope of activity for the Egyptian private sector and permits increased participation by foreign enterprises in the economic life of the country. This change of policy is, however, being implemented very cautiously.

2. It can be safely assumed that this important shift in policy reflects the conviction that the private sector will introduce greater efficiency and responsiveness under competitive conditions. This conviction, in turn, is based on historical evidence confirming the poor performance of state-owned enterprises. Such enterprises are often bureaucratic in their operations and unresponsive to demand. More often than not they have become a financial burden to the state because political circumstances induced state subsidies and because management was not under constant competitive pressure to market goods and services at the lowest possible cost. The disappointing performance of state-owned enterprises in the absence of competitive marked-based provision of goods and services is therefore a fundamental motive for shifting from public to private management and ownership.

3. Ordinarily privatization means the transfer of productive assets from the public to the private sector <u>under competitive conditions</u>. In fact it can be argued that in the absence of competition there would be little incentive for efficiency and responsiveness. When the absence of competition is coupled with the absence of proper governmental controls and regulations, as is often the case in developing countries, the private sector's drive for maximizing profit will work against the interests of the society in general.

4. A pragmatic rather than a dogmatic approach has inclined the Government of Egypt to enlarge the role of the private sector in all economic sectors. In the field of agriculture it is gradually removing the highly restrictive conditions which have virtually dictated almost all aspects of farming activities. The activities so affected have included: the crops that the farmer could grow; the kind and quantities of fertilizer and other inputs to be applied; the government agency that would provide him with inputs and specify the price to be paid for them; and the sale of his products to a government agency at prices fixed by government.

5. Today, by contrast, except for cotton, sugarcane, and rice, the farmer enjoys free choice in the crops he may grow and the sale of his produce in the free market. Even so, in spite of the removal of restrictions, the government remains the sole or the primary

provider of agricultural inputs for farmers.

Divestiture/Privatization of Input Activities

6. The government, having decided that it might be desirable to privatize the agricultural input activities of the Principal Bank for Development and Agricultural Credit (PBDAC), has commissioned two projects. One of these deals with the strengthening of the role, organization, and conduct of the credit functions of PBDAC. The other deals with divesting PBDAC of its input operations and/or privatizing these activities.

7. Putting aside the issue of privatization in general, in the particular case of PBDAC another important consideration seems to have led to the decision that a study of the divestiture of the input activities of the Bank should be undertaken. It is not very common for a financial institution to be involved in purely commercial operations. It can be taken for granted that such involvement diverts the attention of the institution away from its principal function, which is the granting of credit, and towards its non-banking activities. This will be ostensibly the case when about half of the staff of the institution are engaged in non-banking activities and as much as almost half its profits is derived from these trading activities. The government's understandable conclusion was that PBDAC cannot function efficiently and effectively as a credit institution so long as it is also responsible for providing agricultural inputs for farmers, marketing their products, and performing various other activities alien to its banking functions.

Special Features of PBDAC Input Activities

8. In investigating options for the privatization of the input activities of PBDAC, the following very important facts should be kept in mind:

1. The transfer of PBDAC's physical assets is not a principal issue;

2. Owing to the absence of competition, it is impossible to measure the efficiency and responsiveness of PBDAC; and

3. Private sector involvement in distributing inputs is severely inhibited.

9. First, contrary to the norm in privatization, the transfer of the PBDAC's physical assets is not the principal issue. In fact the privatization of the storage and other facilities of the Bank assume importance if, and only if, in specific locations the private sector does not have or is unable to acquire such facilities. Therefore, the issue instead is that of a change in government policy, from supplying production inputs to farmers

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through a governmental agency or transferring these activities to the private sector, wholly or partially, immediately or gradually. The essential change required is the revision or elimination of laws and regulations that presently deny or constrain the private sector from participating in the production, import, distribution, storage, and sale of agricultural inputs.

10. Second, as already mentioned, the assumed benefits of privatization are based on using the market place to achieve more efficient and effective economic institutions. Ordinarily the efficiency of an institution is measured by comparing its performance against other institutions engaged in the same or similar activities. In Egypt the measurement of the performance of PBDAC by such criteria as efficiency, economy, responsiveness, and profitability is not possible because of the absence of competition. Trade in fertilizers is an exclusive monopoly of the government. The private sector has no participation in this activity in the face of government's absolute monopoly on import, domestic production, transportation, storage, distribution, and sale of solid fertilizers. The government has also a virtual monopoly in all or some aspects of import, domestic production, storage, distribution, and sale of the other major inputs such as feed, seed, pesticides, and jute bags.

11. Even where, as in the case of production credit, the monopolistic situation does not prevail it is virtually impossible for the farmer to satisfy his need for credit from other sources. PBDAC is the principal source of credit for agriculture and practically the only source of seasonal credit to small farmers with credit provided in kind rather than in cash. It is therefore impossible to gauge PBDAC's efficiency when there is no basis for comparison with other institutions in the public or private sector engaged in the same activity.

Inhibitions on Private Sector Participation

12. The involvement of private firms in the distribution of inputs is inhibited by several important characteristics of the present economic scene in this field:

1. The subsidization of the inputs provided by PBDAC;
2. The dominant position of PBDAC in providing credit for small farmers, largely in kind; and
3. The existence of a large parastated in an important market area.

13. **Input Subsidies**. First, and most important, is the element of subsidy for the inputs provided by PBDAC to the farmers. The farmer pays for only part of the cost, the remaining portion being assimilated by the government through budgetary allocations. Initially the provision of subsidized inputs was treated as an offset to government controlled prices paid to the farmer for his

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crops. In spite of the fact that controlled prices of crops were removed and now restrictions exist for only three crops, however, the government continues to provide subsidized inputs through PBDAC for all crops.

14. The existence of subsidies is an impediment to privatization because the private sector would be at a disadvantage in competition with PBDAC unless private firms as well were permitted to distribute subsidized inputs. Full private sector participation presupposes the treatment of the private sector on the same footing as the public sector. This does not necessarily mean that the removal of subsidies is a pre-condition to privatization. Subsides could be applied to inputs distributed by the private sector as well as those distributed by PBDAC. However, the application of subsidy to inputs distributed by a large number of firms would be extremely difficult and cumbersome.

15. Alternatively and as an interim measure, PBDAC could continue to provide inputs at subsidized prices and the private sector allowed to sell at unsubsidized prices. The existence of a differential between the subsidized and the unsubsidized price for a commodity, assuming demand is sustained, would inevitably create the opportunity for misallocation of subsidized inputs for a quick profit, an unhealthy market situation, and other irregularities. Moreover, it is reasonable to assume that under such a system, especially if the price differential were significant, a vested interest group among farmers and intermediaries for trade in a particular input would come into being with consequent agitation for the continuation of subsidies.

16. Of the three possible alternatives - - application of subsidy to private sector, distribution of subsidized inputs by the public sector and unsubsidized inputs by the private sector, and, finally, the removal of subsidies - - the latter is the simplest, the most practical, and administratively the least difficult to implement.

17. **Production Credit for Farmers**. A second inhibiting factor affecting the privatization of input supply is found in the fact that the majority of production credit is provided by PBDAC and provided to the farmers in kind rather than in cash. The government determines the input and cash requirements of the farmer for each crop. PBDAC provides the farmer with this package of commodities and cash. Literally, the farmer receives the package as a whole, no more, no less. He has no choice in the quantities or kind of inputs; he is not at liberty to receive a cash loan instead of an in-kind loan. His account with the bank is debited for the whole and he repays the loan at a highly subsidized rate of interest.

18. Obviously, so long as cash credit is not provided to the farmer by PBDAC or credit is not provided to private sector

distributors who in turn would extend credit to the farmer, the private sector could not play an important role in the distribution of inputs. The fact that the rate of interest charged is highly subsidized may not be a crucial factor. More important is the fact that the farmer does not and will not have access to credit from other financial institutions. Other financial institutions are reluctant to extend credit to small farmers because they believe it to be too costly and risky to do so. If PBDAC is not prepared to provide cash credit because it believes that the recovery of its loans will be jeopardized, the private sector's involvement in input distribution will at best be marginal. With subsidy and credit coupled together, as is presently the case with PBDAC operations, the expectation that the private sector would assume an important role in the distribution of inputs becomes highly doubtful.

19. **The Presence of PBDAC in the Market**. To the above two a third factor inhibiting privatization should be added. The existence of a large parastatal in an important market segment can impede rather than hasten the development of the private sector's interest and readiness to engage in input distribution. At present this is the case with the input function of PBDAC. In theory it may be possible to invite the private sector to participate to a limited extent in the distribution of all or a part of a specific input. Likewise, it may be possible to invite the private sector to provide the future additional requirements of a particular input with a corresponding reduction in PBDAC's present level of activity.

20. The presence of PBDAC at a high level of activity, however, will constitute an inhibiting factor in the initial participation and the expansion of the activity of the private sector. Furthermore, in the particular case of PBDAC a further inhibiting factor for private sector involvement in the distribution of inputs is that, while PBDAC has the experience, the staff, the finance, and the facilities needed for input distribution, the private sector is not in a similar position.

21. The foregoing advantages for PBDAC are particularly notable in the case of finance and facilities. PBDAC has easy access to credit from the government, local banks, and the bilateral and the international sources of finance. PBDAC has already in place a network of literally thousands of distribution outlets. This is not the case with the private sector. The acquisition of the physical facilities may be difficult and very costly. Without PBDAC's help it may not be possible for the private sector to be able to reach the end users of input commodities. It may take an inordinately long time to establish its credit worthiness with the commercial banks and to put its distribution network in place.

The Private Sector and Input Distribution

22. The private sector's share in the Egyptian economy has been growing rapidly. A fair number of firms of large and medium size are very actively engaged in the production, importation, distribution, and sale of some agricultural inputs. The commodities handled by such firms include seed, feed, pesticides, agricultural machinery, and foliar fertilizer. With the exception of solid fertilizers, these firms provide to the farmer the same inputs presently distributed by PBDAC, albeit in much smaller quantities. Some of the firms have extensive network and distribution facilities. In numerous conversations with the managers of these firms the mission was informed, and has concluded, that the private sector is interested in and capable of providing the services now provided by PBDAC.

23. The three salient conditions reiterated by the private sector for its full involvement were:

1. Government policies should be made clear and adhered to over a long period.

2. The private sector cannot and will not become totally involved in agricultural input distribution if it is not treated on the same footing as the public sector; and

3. The privatization of PBDACs input distribution should proceed gradually.

24. The private sector expresses the view that government objectives can be accommodated if policies are clear, constant, and uniformly enforced. Private firms claim and complain that policies, laws, and regulations are created and changed with such frequency and enforced with such capriciousness that farmers and support industries are discouraged from long-term commitments and investments. Lack of confidence could be a serious handicap to privatization efforts. The only solution to the problem is for the government to announce policies clearly and not deviate from them.

25. The second point hardly needs further elaboration. The private sector is asking for a level playing field. It is not reasonable to expect the private sector to compete with a government agency if that agency enjoys advantages denied to the private sector. Preferential rates of foreign exchange, lower custom duties, subsidized ingredients for manufacturing, and subsidized sale prices are among the obvious examples of such advantages.

26. There is a concurrence of views between the private and public sectors on the need for a gradual approach to privatization. Both parties are of the opinion that privatization should be implemented

gradually. In this connection it is the mission's impression that the private sector wants to have the best of the two worlds. Private firms would like to be given a free rein in areas of activity where profits can be made with few inconveniences, an understandable desire insofar as the private sector is concerned. The mission agrees with the views of the private sector on the first two points and supports gradualism. However, the mission believes that the private sector's dependence on the government should be reduced as quickly as is possible.

Principal Considerations in Privatization Options

27. Theoretically, a wide array of divestiture/privatization options is available. Such options range through the divestiture /privatization of PBDAC's input and allied operations in their entirety to include divestiture/privatization of the supply of some of the commodities at the import, wholesale, or retail level. All of these possibilities must be evaluated in terms of their effects upon the farmer, PBDAC, and PBDAC's employees.

28. Privatization options for one or all inputs and for all or part of the activities related to an input have been the subject of previous studies. The most elaborate of these studies are Jennifer Bremer's Privatization of Agricultural Input Supply: Constraints and Opportunities for Reform in the Egyptian Situation, (February, 1988), and her Demand for Nitrogenous Fertilizers in Upper Egypt and Potential Supply of Marketing Services, (April, 1987). The mission has reviewed these recommendations and others with care and in detail.

29. The mission questions the options of divestiture and privatization of PBDAC's input activities as a whole. The principal reason for this is that neither of the two provide for competition. Additionally, the creation of a new governmental entity to which the input functions of PBDAC would be transferred would require capital and the transfer of certain assets and of the staff of PBDAC presently engaged in input distribution. The creation of such an entity would take several years at least, would certainly mean additional operating costs, and might further delay any meaningful move towards privatization because of the inherent opposition of entrenched interests in the new organization. The same reasons are equally valid for not recommending the creation of a private sector entity. They combine with the additional reason that it cannot be taken for granted that the private sector is prepared to invest the large sums required for such an undertaking. If, however, the process of privatization is likely to be protracted and disengagement of PBDAC's input from its banking activities is urgent, divestiture and privatization of the input activities as a whole may be considered as an intermediate step towards privatization.

30. In the recommended options it has been assumed that:

1. The Government of Egypt and PBDAC are truly interested in privatization and will assist the private sector to establish itself and expand its activities, particularly in relation to credit and storage facilities.

2. PBDAC is prepared to decouple credit to farmers from purchase of goods from PBDAC.

3. A level playing field will prevail until subsidies are totally removed.

4. Each option for privatization should be evaluated against that of privatizing all inputs within a reasonably short period of time. Limited privatization may be preferable to no privatization at all. It must be recognized, however, that the ultimate objective of the government is full privatization.

5. Privatization of the several input categories should avoid uniform approaches because the problems associated with each input category differ.

6. The implementation of privatization should be gradual. There are two important reasons for a gradual approach. The principal reason is that PBDAC has had a monopoly in the distribution of the majority of the inputs. The involvement and greater participation of the private sector will take some time. The second reason is that privatization will have serious adverse effects on the income of PBDAC. Phasing PBDAC out of input distribution over a period of five to seven years will provide ample opportunity for necessary adjustments.

Organization of the Remainder of the Report

31. The following chapter deals with the individual inputs and recommended options for their privatization. This is followed by two chapters analyzing the implications of privatization for the organization, staffing, and finances of PBDAC. The final chapter of the main report summarizes the findings and recommendations of the study and their effects. There are several annexes to the study. These are the fertilizers annex; the economic analysis annex which deals with removal of subsidies and application of world prices on inputs and farm products; the sociological assessment of farmers and private sector attitudes towards privatization of inputs; and detailed findings about PBDAC's finances.

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II. THE SUPPLY OF AGRICULTURAL INPUTS

Introduction

2.1 This chapter presents findings and recommendations respecting the roles of PBDAC and the private sector in the supply of agricultural production inputs for farmers. It deals successively with the input subsectors of fertilizers, seed, agricultural chemicals (pesticides), agricultural machinery and equipment, animal feed, and jute bags. Each of these sections describes the character and dimensions of the subsector; the roles and relationships of PBDAC and associated governmental agencies in supplying inputs to end users; and the scope and nature of the participation of private firms in input supply.

2.2 The successive sections then summarize relevant findings in these respects and finally present options for proceeding with the privatization of the subsector. The options here presented focus on the individual subsectors, for the possibility that the Government of Egypt may favor approaching privatization subsector by subsector rather than embarking on privatization of input categories more or less simultaneously as parts of an integrated program.

2.3 The final chapter of this report returns to the subject of privatization of input supply. In doing so the concluding chapter summarizes findings and privatization recommendations and effects of the recommended program for the input supply activities of the Bank.

Fertilizer Distribution and Marketing

2.4 This section describes the Egyptian fertilizer sector as it concerns domestic production, import procurement, and the distribution of fertilizer to the country's four million farmers. In doing so the section, within the limits of available information:

- Characterizes the markets and demand for fertilizers;
- Describes the sources of supply;
- Describes the current distribution system;

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- Assesses the strengths and weaknesses of current arrangements and the role of PBDAC and the private sector; and

- Examines the possibilities, opportunities, and constraints on the privatization of PBDAC's activities in the supply of fertilizer.

A more detailed description and analysis of the fertilizer sector is provided in Annex A to this report.

The Market for Fertilizers

2.5 Egypt's limited agricultural land base of six million feddans of old lands in the Nile Valley and Delta, supplemented by a further one million feddans of reclaimed lands, supports a fully irrigated agriculture with approximately four million farm holdings. The majority of farms are less than 3 feddans in area and 80% of the total cultivatable land is occupied by farms of less than 10 feddans. Farms are fragmented and this is a considerable constraint to mechanization and one reason for the block farming system imposed by the government. The land holdings are concentrated around the 4,500 villages, which vary in population size from 1,500 to 30,000 and in the services and amenities available.

2.6 Within the old lands area available irrigation water is not a constraint, but water management and the associated problems of drainage and soil salinity are. Low soil nitrogen levels, widespread phosphate deficiency, and zinc, iron, manganese and copper deficiencies are the major soil nutrient deficiencies. In the new land areas similar soil nutrient deficiencies exist but to a much greater extent and degree; these soils are generally very coarse textured with poor water holding capacity.

2.7 Farming systems under the full irrigation regime are based on either two- or three-year rotations of the major field crops of cotton, wheat, maize, and rice with Egyptian Clover (Berseem) and leguminous field crops such as beans and an increasing area of vegetables. Cropping intensity is high with three cropping seasons, winter, summer and Nili or fall season crops leading to an average of two crops per year. A very wide range of vegetable and minor crops is grown. In addition there are almost 300,000 feddans of sugar cane in Upper Egypt and throughout the agricultural areas an increasing area of permanent fruit trees, primarily citrus.

2.8 Fertilizer consumption in Egypt has increased substantially over the last 30 years, reaching 793,000 tons N, 191,000 tons P2O5, and 29,700 tons K2O in 1987-8, contained in 3.5 million product tons. Since 1970-1 N consumption has increased by 5.3% per annum from 330,800 tons; P2O5 consumption has increased from a lower base

of 40,200 tons by 9.6% per annum; and K2O by 17.5% per annum from a negligible base in 1970-1 of 1,900 tons. In the past 5 years growth in consumption has been less spectacular. N consumption increased by an average 1.6% p.a. between 1983-4 and 1987-8, P2O5 by 4.8%, and K2O by 14.1%.

2.9 Consumption should not be equated with demand. The total supply of fertilizer available to Egyptian farmers is constrained by the level of domestic production and the availability of foreign exchange allocated for fertilizer imports.

2.10 Fertilizer nutrient consumption in Egypt is often cited as being very high by world standards. This contention is based on comparisons of nutrient usage per hectare of cultivated land and permanent crops. It fails, however, to take account of the unique nature of Egyptian agriculture: its almost total reliance on irrigation and a consequent cropping intensity of 2.2 crops. It should suffice to say that fertilizer use in Egypt is well developed by world standards.

2.11 The Egyptian fertilizer product mix -- that is the proportions of the various nitrogen, phosphate, and potash products used - seeks to reflect the agronomic needs of the soils, crops, and management practices but has probably been distorted by a uniform pricing policy for nitrogen products.

2.12 The striking feature about the product mix is the reliance on straight fertilizer products, with use of mixtures limited to specialized fully soluble NPK plus trace element mixtures for drip irrigation in new lands and specialized greenhouse production systems. Over the next few years the nitrogen product mix will swing to a predominance of Ammonium Nitrate(AN) and urea with smaller quantities of Ammonium Sulfate(AS) and Calcium Nitrate(CN). The alkaline soils and basin irrigation techniques combined with surface application of nitrogen fertilizer are not conducive to efficient utilization of urea. On the clay loams of the Nile Valley there is no significant difference in nitrogen efficiency between urea and AN or CAN when incorporated into the soil. On the coarse textured sandy soils urea has always been less efficient than either AN or AS, even with soil incorporation. Until 1987 there was no difference in the unit price (per kg N) between CAN, AN, AS, and urea, so that farmers faced with an equal cost choice showed a distinct preference for AN and CAN.

2.13 Single superphosphate has been the traditional phosphate product used in Egypt but in recent years there has been an increased use of Triple Superphosphate, encouraged by the GOE in order to take advantage from lower freight costs for the more concentrated product. TSP was supplied initially from imports and then from the Abu Zaabal plant. No attempt has been made to introduce ammonium phosphates to the Egyptian market. To date there have been no significant responses to sulfur and the use of over

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1 million tons of SSP, containing 17 % S, and 200,000 tons of AS containing 24 % S, annually will have influenced this situation. Future increases in non sulfur containing fertilizers may induce some S deficiencies in the future.

2.14 All the potash fertilizer has been supplied as potassium sulfate containing 48 % K2O. The use of potassium chloride is banned by decree based on the deleterious effect the chloride would have on already alkaline soils.

2.15 The micronutrient market is dominated by the use of foliar fertilizers, predominantly used on cotton and vegetable crops. Zinc sulfate and other micronutrient products are used to a limited extent on other field crops.

2.16 There are quite distinct differences in both total nutrient use and product mix in the three main regions of the country. The average nutrient consumption in tons for Upper, Middle, and Lower Egypt averaged over the 5 years ending 1987/88 were:

Region	N	P2O5	K2O
Upper Egypt	166,881	33,005	10,063
Middle Egypt	182,782	39,913	3,842
Lower Egypt	396,069	105,591	15,060

When expressed as nutrient usage per arable and permanent crop area the intensity of fertilizer use is highest in Upper Egypt and lowest in Lower Egypt.

2.17 The higher average rates in Upper Egypt reflect the high use on sugarcane in that region and the relatively higher proportion of crop area in wheat and maize compared to Middle and Lower Egypt. The high proportion of cotton and rice in Lower Egypt, with lower nitrogen application rates than used on sugarcane, wheat, and maize, bring down the average application rates. At the Governorate level the largest quantity of fertilizer used is in Beheira Governorate. It should be noted that one third of the total use is accounted for by four Governorates: Beheira, Dakahlia, Sharkia and Gharbia. The seasonal cropping patterns and cropping intensity lead to a fairly even spread of demand throughout the year but with a larger summer peak in Upper Egypt than in other areas.

Sources of Supply

2.18 Egypt has a developed fertilizer manufacturing capability which supplies 85 % of the nitrogen and 100% of the phosphate

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requirements, using indigenous hydrocarbon and phosphate rock resources. There are six public sector fertilizer companies operating nine nitrogen plants and three phosphate plants; two plants are located in Upper Egypt and the remainder in Lower Egypt. All of the potash fertilizer is imported plus residual nitrogen requirements of Ammonium Nitrate, Ammonium Sulphate, and the Sulfur for phosphates manufacture.

2.19 During the current Five Year Plan considerable investments are planned for new plants and the rehabilitation of older, less economic plants. By 1993 there should be surplus nitrogen capacity allowing for limited exports of urea while maintaining a modest level of Ammonium Sulfate imports. Necessary improvements to the quality and efficiency of phosphate fertilizers is also planned. Overall, it is possible for the fertilizer industry to bring the cost of energy, currently subsidized, up to world price levels and be competitive with imports by the mid 1990's.

2.20 The expansion of the domestic industry has led to a decline in fertilizer imports in recent years. Nitrogen imports accounted for 50% of consumption in 1961-2, reaching a peak in 1973 at 80% of consumption before declining. In 1987-8 imports of nitrogen were 10% of consumption. The last imports of urea were made in 1984-5. In 1982-3 a counter - trade protocol was agreed with the USSR which included the supply of AS from USSR. Under this agreement Egypt received 122,500 tons AS in 1982-3 and 1983-4 and 126,000 annually from 1984-5 until 1986-7. In 1987/88 the annual tonnage was increased to 168,000 tons. Phosphate imports averaged around 40% of total consumption during the early 1960's and then declined to zero from 1969 to 1973. From 1974 imports increased but were less than 12% of consumption until 1982. Increases occurred during the next three years with imports of Triple Superphosphate, which accounted for up to 20% of consumption. Since 1985 there have been no imports of phosphate fertilizers although consumption of the previously imported TSP occurred through 1987/88.

2.21 With no domestic production of potash all potash fertilizers have been imported, in the form of potassium sulfate. For the past two years approximately 60,000 tons of potassium sulfate have been imported and a further 1550 tons of soluble NPK's supplied under Dutch Aid in 1987.

Fertilizer Distribution

2.22 The fertilizer distribution system was completely overhauled in 1976 with the establishment of The Principal Bank for Development and Agricultural Credit and of monopoly control of the supply of fertilizer and other agricultural inputs distribution with the Bank. Today this system remains virtually unchanged, and forms an integral part of the government's control of production, import, distribution, and use of fertilizer. Despite many

shortcomings the fertilizer distribution system as operated by PBDAC works well in ensuring the availability of 3.5 million tons of fertilizer annually to Egypt's farmers. The shortcomings of the system stem from the fact that PBDAC is not a marketing organization but operates as a distribution and allocation control organization for the government.

2.23 Recent amendments to the legislation have, in theory, allowed private sector participation in fertilizer importation and four private companies have become involved in this activity. Special dispensations have also recently allowed some private sector participation in distribution and marketing but to date the private sector involvement is minimal and fraught with financial and bureaucratic hurdles.

2.24 A further element exists in distribution and marketing, the so-called black market in fertilizers operated by farmers and traders at the village, district, and governorate levels. This channel is essentially a redistribution process of the official allocations of fertilizer and a source of temporary cash credit for farmers. It exists due to the constraint on supply, the two tier price system of subsidized and unsubsidized fertilizer, and because it provides a means of obtaining low cost short term cash credit. It is thought that about 25% of all fertilizer enters into this market.

2.25 PBDAC has a large and extensive distribution system throughout the agricultural areas, undoubtedly a major strength of its fertilizer activities. The system is organized at three levels; governorate warehouses, district shounas, and village mandubias and provide a total of almost 560,000 tons of storage space.

2.26 There are between 1 and 3 governorate warehouses located in each governorate, a total of 65 providing storage capacity of approximately 230,000 tons. These warehouses are covered structures with masonry walls usually about 1,000 m2 in area. There are 476 shounas with a total covered or partially covered storage capacity of 330,000 tons. These shounas are mostly fenced open areas ranging in size from 2,000 to 20,000 m2 and contain a small office structure and sometimes an open sided shed for storage. Most storage is in the open. Truck scales, paving and lighting are rare and there is no mechanized materials handling equipment.

2.27 The mandubias are retail outlets situated in 4,312 villages. They are usually less than 400 m2 and rarely offer any form of covered storage. In some locations the mandubias are located alongside the shounas and sometimes together with the village bank and shouna in the one location. The mandubias are run as separate entities from the shouna, which is solely a wholesale distribution site. PBDAC owns a total of 274 governorate warehouses and Shounas and leases the other facilities. It is believed that most of the Mandubias are leased.

2.28 Deliveries from domestic factories or from the port are made to both the warehouses and the shounas. PBDAC claims that approximately 50 % of all the primary distribution is made direct to shounas, bypassing the warehouses and getting fertilizer closer to the location of final consumption. The restriction on this practice is the varying degrees of access to the shounas for the 20 to 25 ton trucks used for most of this transportation. Fertilizer is distributed to the mandubias in trucks of smaller capacity more suited to the often unpaved access roads and limited access to the storages. Sometimes direct delivery to farms from shounas is arranged for larger orders but the deliveries are processed through the mandubias.

2.29 The operation of shounas and mandubias appears to vary considerably and there does not appear to be a fixed standard of house-keeping or operational standards. Training of storage personnel does not include any systematic attempt to improve materials handling knowledge or abilities. Product losses in shounas cannot be gauged from PBDAC's records; stock control is exercised by counting bags without regard for the quality and quantity of their contents. Losses are passed on to farmers in the form of damaged bags, underweight bags, and substandard material. Fertilizer losses in the distribution and storage system were recently estimated by the World Bank at around 5.5%, but this figure is at best an educated guess.

2.30 The PBDAC distribution system has the great advantage of being able to rationalize primary and secondary distribution throughout the country from the factories and ports. In addition the location and number of mandubias provide farmers with ready access to fertilizer in close proximity (reportedly no more than 5 km) to every farm. There are, however, weaknesses:

- The lack of sufficient covered storage;
- The lack of maintenance of existing facilities;
- The lack of skills in storage and handling techniques; and
- The high level of product losses.

2.31 Total PBDAC distribution and marketing costs were reported to be LE 9.84/t and LE 11.51/t for 1986/87 and 1987/88, respectively. The direct costs associated with fertilizer distribution are almost 90% of the total, with only 13 - 14% being an allocation of overheads. The direct costs are assumed to be 80% of the total costs of input distribution. The allocation of costs of storage facilities between input distribution and crop marketing is not clear. The allocation of organization overheads is

reportedly made on the basis of allocations pro rated to the direct costs.

2.32 Labor costs account for 65% of total costs; a further 9% is accounted for in services, primarily travelling and non freight transportation costs; and financing and interest charges comprise 17% of the total. Depreciation, maintenance, and normal marketing expenses such as advertising, promotion, and market development, are virtually non existent.

2.33 The financing costs at 12% interest rate on average monthly stocks, estimated to be 22% of annual sales, are low at LE 1.95/t due to the relatively high stock turn of 4.6. Depreciation charges are low as most distribution points owned by PBDAC have a fully written off book value and no revaluation of assets has been made. Other physical assets are minimal.

2.34 When total transport costs are included the total distribution and marketing costs in 1987-8 were LE 25.35/t, including an allowance for 3% losses, which the PBDAC accounting system does not recognize. Transport accounts for approximately 40% (LE 10.96/t), finance only 8%, and loss allowance 11%. The total marketing cost per ton is low compared to other developing countries, but comparisons should be made with caution as transport costs which comprise the largest item are greatly dependent on market dispersion. In 1986-7 total marketing costs in developed fertilizer markets in Asia ranged around US$ 30/t, compared to the Egyptian costs of around US$ 10/t. The ratio to product cost in Egypt is however similar to that in other countries and low costs whilst laudable are not necessarily good. The lack of maintenance and storage facilities in the PBDAC system is a contributing factor to the low costs and needs to be addressed.

Fertilizer Prices

2.35 Fertilizer prices are recommended by the PBDAC Fertilizer Use Committee and GAASF and approved by the High Policy Committee each year. The official prices are published through PBDAC decrees and consist of two price lists, subsidized and unsubsidized prices.

2.36 After a period of no price increases for five years the subsidized prices started to increase in 1987-8 as the GOE began implementing a policy of subsidy reduction. Prices were increased in March, 1988, and again in August, 1988. The first increase was associated with the change in the method of subsidy payment, when all direct subsidy payments were made to PBDAC and no longer split between the factories and PBDAC, and the increase in energy costs to the manufacturers.

2.37 The second increase was part of the subsidy reduction program. When the subsidized prices are compared to the

unsubsidized prices it is seen that over the past seven years there has been a marked change in the relativities of the two price sets. The unweighted average subsidized price for nitrogen (expressed as LE / kg N) was 60% of the unsubsidized price in 1982-3, then declined to about 40% for the next three years, and has since recovered to 64%. A similar pattern exists for phosphate but at a higher level of subsidization. Subsidized potash prices have,however, remained at approximately 27% of the unsubsidized price.

2.38 The logic and method of setting the unsubsidized prices is unclear. It is related to the actual costs of procurement but not directly so. The subsidized price levels are in theory set after consideration of farm enterprise profitability but in practice the availability of funds for subsidization appears to have been the over riding factor.

2.39 Retail prices for all products are the same throughout the country, a policy which involves equalization of product pricing from different factories and transportation subsidization. Until 1987-8 the unit prices (i.e. price per kg of nutrient) was basically equalized for nitrogen and phosphate products. Irrespective of product form the subsidized retail price for N was 27p/kg for the four years to 1987-8 with the exception of CN, at 31p/kg N; the equivalent price for P2O5 was 20p/kg. The changes in retail pricing in the past two years have abandoned this policy but the impact of both the old and new pricing structures has been to distort the product preferences of farmers. The interaction of price and product substitution is not manifested under the controlled allocation system of fertilizer supply today but needs to be taken into account in rationalizing the pricing system.

2.40 The actual prices paid by farmers for fertilizers differ from the official retail prices. In the first place all farmers are entitled to an allocation of fertilizers based on the official requirements for their approved cropping programs. PBDAC charges an additional LE 4.5/t for freight to the mandubias above the retail price list and a small levy for the MOA extension agents' social services fund. Further small levies are also added to the prices as a form of governorate level taxation. These vary from governorate to governorate.

2.41 The Credit and Agrarian Reform Cooperatives are entitled to a 5% discount from the official prices, a concession which was introduced in 1986-7 following pressure from the cooperatives. In 1987-8 approximately 80% of all sales made by PBDAC went to cooperative members. The discount is used by the cooperatives as a source of funding although it is officially a compensation for the cost of distributing fertilizers. In practice only 280 cooperatives were actually performing this role in 1987-8.

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2.42 In theory farmers are entitled to their allocations of subsidized fertilizer according to their cropping pattern and the official recommended needs per feddan; they may then purchase additional quantities at unsubsidized prices, if supplies are available. In practice it appears that very little, if any, fertilizer is purchased from PBDAC at unsubsidized prices due to lack of supplies and the operation of a thriving black market at price levels between the subsidized and unsubsidized prices.

Fertilizer Subsidies

2.43 Historically the fertilizer subsidies have fallen into seven categories:

1. Indirect production subsidies via energy pricing;
2. Direct production cost subsidies;
3. Direct distribution product subsidies;
4. Direct freight subsidies,included with category 3;
5. Indirect freight subsidies via energy pricing;
6. Indirect subsidies through preferential exchange rates for imports; and
7. Direct distribution subsidies for cooperatives.

Neither the indirect subsidies on domestic production nor those on transport costs will be considered here as they are not sectorially specific.

2.44 The direct production cost subsidies paid to the factories were transferred to direct distribution product subsidies paid to PBDAC in January, 1988. These direct distribution product subsidies include an element of subsidy applicable to the product cost, the difference between ex-factory and retail prices, and an element of freight cost subsidy as farmers do not pay for the cost of delivery into the governorates. These are not separated as such in the method of calculation or payment. The calculation of these subsidies is made as follows:

1. The cost of procurement is adjusted for stock changes by PBDAC;
2. The 16.5% PBDAC commission is added to the net procurement cost;
3. The net revenue from product sales to farmers is

deducted from the above costs; and

4. The resultant value is the subsidy entitlement.

2.45 The subsidy thus includes an element of product cost subsidy and an element of transport subsidy to the primary distribution points. The calculation for 1987-8 is shown below:

Opening Inventory	39.9 million LE
Domestic Purchases	348.9
Import Purchases	46.1
Closing Inventory	77.3
Cost of Product	357.6
PBDAC Commission	47.5
Sub Total	405.1
Net Sales Value	270.8
Subsidy Paid	126.5

The GAASF administers the subsidy funds.

2.46 It was not possible to reconcile the above subsidy calculation, based on PBDAC's records with data from the GAASF for 1987-8. In part this may have been due to changes in procedures during the year and in part to lack of sufficiently detailed data on the value of PBDAC's stocks and procurement costs during the year. The data supplied by the GAASF for 1987-8 gave the total subsidy paid to PBDAC as LE 129 million, LE 25 million on imported products and LE 104 million for domestic products. In addition the factories were paid LE 107 million up to the 31 December but this included approximately LE 37 million for under payment in previous years. The total direct product cost and distribution subsidy for 1987-8 was therefore in the order of LE 199 million.

2.47 In addition to this direct subsidy PBDAC is also paid a rebate for sales made to cooperative members to compensate in full for the 5% discount given to these farmers. The rationale for this is that the cooperatives receive the discount to enable them to distribute the fertilizer; the actual distribution, however, is performed by PBDAC and therefore the organization is compensated. In 1987-8 this rebate was LE 11 million.

2.48 The total cost of imported fertilizers sold by PBDAC in 1987-8 was LE 46.1 million. If the preferential exchange rate had not

been applied the cost would have been LE 119.7 million. There was therefore an indirect subsidy of LE 74 million on imports.

2.49 In summary the 1987/88 fertilizer subsidy amounted to LE 284 million, as follows:

Direct production subsidy	70 million LE
Direct distribution (sales) subsidy	129
Cooperative rebate	11
Sub-total Direct subsidies	210
Indirect Import subsidy	74
Total	284

2.50 The subsidy situation in 1987-8 was complicated by the transition from one payment method to another, by retail price changes, and by ex factory price changes. To clarify the issue estimates of the subsidy per product and per source of supply have been made based on the current retail prices, current ex factory prices, and actual import costs at the preferential exchange rate for the 1987-8 sales quantities. These calculations show that the existing price structure has gone a long way towards reducing the direct subsidies on fertilizers.

2.51 The direct subsidy on imports would have been LE 10.5 million, on domestic products LE 35.8 million, and the cooperative rebate, LE 19.2 million, a total of LE 65.5 million. This is the approximate level of subsidy that will be required in 1988-9, given that sales will be similar to last year.

2.52 The subsidy on imports is limited to potassium sulfate and is at a high level on this product - LE 171/t. Of the domestic nitrogen products, urea is unsubsidized, as is most of the ammonium sulfate with only the small annual production at Helwan being subsidized at the rate of around LE 14/t. The ammonium nitrate from all plants is subsidized, from LE 30 -44/t, except for Talkha which requires only a subsidy of LE 4.5/t at current prices and costs.

2.53 The superphosphate products are all subsidized, single superphosphate at LE 15-20/t and triple superphosphate at LE 46/t. The overall subsidy for <u>all products</u> is 10.8%.

2.54 This reduced subsidy level will, however, be eroded by the proposed energy cost increases in ex-factory prices for 1989-90, which will increase total product cost by 43 %. These increases without any corresponding increase in retail prices would raise the subsidy to about LE 230 million for a full year.

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Fertilizer Margins

2.55 PBDAC operates as would a consignment agent taking a commission from sales of distributed product. The commission is calculated at 16.5 % of the official retail prices and has to cover the operating and overhead expenses of its fertilizer operations. PBDAC's total expenses allocated to fertilizers were LE 9.84/t in 1986-7 and LE 11.51/t in 1987-8. The total commissions in 1987-8 were LE 49 million, with a further LE 11 million from the cooperative rebate and other income of LE 2 million. This represented an income per ton distributed of LE 17.76 and provided a net profit before tax of LE 6.24/t. This compared to LE 6.07/t in the previous year. There is no pricing structure for wholesale pricing or discounts to retailers as PBDAC sells only at the retail level.

2.56 If PBDAC were considered as a merchant agency and allowance made for product losses, the distribution/marketing costs would approximate LE 25/t.

2.57 Based on the current ex factory and retail prices it is calculated that at the 1987-8 sales level PBDAC's income per ton will in 1988-9 rise to LE 29.5 and the net profit before tax to LE 16.6/t. These calculations include increased commissions and cooperative rebate due to the higher retail prices and increased financing costs due to the higher level of working capital required. Obviously as retail prices are increased, as the subsidy reduction policy continues, the current formula for calculating PBDAC's commission is going to provide windfall profits and this situation is in urgent need of review.

Private Sector Involvement in Fertilizer Marketing

2.58 From 1976 until 1988 PBDAC had by law a complete monopoly on fertilizer procurement and distribution. In January, 1988 the law was amended to provide the private sector with access to importation of fertilizer and its distribution, but no changes were made to PBDAC's monopoly on purchase and distribution of domestic fertilizer supplies.

2.59 The fact that the private sector has not taken advantage of the changed regulations is due to the following discriminations against private sector companies:

- There is no entitlement to preferential exchange rates;
- At least 25 % of the foreign exchange for imports must be supplied from the importers own sources as an advance payment;

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- No subsidy is applicable to private sector imports;
- No freight subsidy is applicable;
- There is no well established distribution system outside PBDAC;
- Access to working capital is limited for both the potential national distributors and potential retailers; and
- There are numerous and complicated permissions to be obtained before importation is allowed.

2.60 Under these circumstances the private sector is not able to compete with PBDAC for market share of the main stream products. The limited experience of the private sector to date is that under the current conditions it will not participate in the fertilizer market in competition with PBDAC to any perceptible degree. This is not to say that the private sector has lost all interest in participating in the market. Interested parties are merely waiting for the GOE to provide the opportunity for them to participate under equal terms with PBDAC. Given such circumstances the private sector has expressed interest in establishing distribution networks though not necessarily as extensive as PBDAC's.

Assessment of the Current Situation

2.61 The Egyptian fertilizer sector, for years under very stringent control and direction of the GOE, is undergoing a rapid change in policy direction that requires very careful planning and implementation of further change to ensure that its current strengths are capitalized on and its weaknesses eliminated so that the farmers and the nation may obtain the greatest productivity from the limited land and water resources of the agricultural sector.

2.62 The current sector is characterized by:

- State ownership of domestic production, which accounts for 85% of the total nitrogen requirements and 100% of P2O5 requirements;
- Imports of 15% of nitrogen and 100% of potash, restricted by availability of foreign exchange;
- Local financial production costs, which are now close to world market fob prices but are distorted by subsidized energy inputs masking inefficiencies in

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processes, management, and raw materials;

- Well developed usage of nitrogen, almost 800,000 tons per annum, and to a lesser degree of phosphate, 190,000 tons per annum, and potash30,000 tons per annum;
- A controlled allocative distribution system through PBDAC, a government controlled credit and agricultural input distribution organization;
- A supply constrained market in which free demand factors have been distorted;
- Supply constrained by domestic production limitations and foreign exchange restrictions for importation;
- Subsidized fertilizer prices incorporating both product and distribution subsidies and equalized pricing throughout the country;
- The linkage of input supply to cash and in kind credit for cropping activities through PBDAC;
- A secondary redistribution market among farmers of subsidized fertilizers at black market prices;
- Poor efficiency in fertilizer use at the farm level associated with limitations in extension services,and partially associated with low fertilizer prices compared to other inputs;
- The decontrol of crop output prices except for cotton, sugarcane and rice;
- A decline in the rate of growth of fertilizer usage; and
- Minimal involvement of the private sector.

2.63 The objective of this study is to explore, examine, and recommend options for privatizing the input distribution activities of PBDAC, including fertilizer. Any moves towards privatization will need to be preferably beneficial and at the very least provide the minimum disruption to the established system.

2.64 **Strengths of the Existing System.** The greatest strength of the existing system is that it works. It may not be efficient but it ensures access by farmers to whatever fertilizer supplies are available in a reasonable time frame. The cropping pattern control

of the MOA works to the extent of overcoming the limitations of fragmented farm holdings and providing through the official fertilizer allocations an equity of access to restricted fertilizer supplies. The PBDAC distribution system of governorate warehouses, shounas, and mandubias provides full coverage of the total agricultural areas and ease of access to these supplies for all farmers. The provision and linkage of credit to fertilizer and other inputs ensures that input use is not constrained by lack of financial resources and assists in a degree of technology transfer. The system also enables a very high rate of loan recovery to be maintained.

2.65 The existence of a sole distribution organization in conjunction with the crop planning activities of the MOA leads to a simple and straight forward planning process. The ease of planning and the total control of fertilizer distribution provides opportunity for obtaining efficiency in national distribution of both domestic and imported supplies of fertilizer. The monopoly position of PBDAC also provides economies of scale which are reflected in the low cost of distribution in comparison to other countries. The control over both input and output prices has enabled the government to ensure that crop - fertilizer price ratios have been sufficiently attractive to encourage and develop fertilizer use.

2.66 Weaknesses of the Existing System. Despite the strengths summarized above, the sector suffers from many deficiencies. These arise from policy, structural, and operational deficiencies, as follows:

1. In the first place insufficient supply to satisfy demand has necessitated some form of equitable allocation of fertilizer, but this has been distorted by misallocations and a generally inflexible distribution system.

2. There has been inadequate provision of products for specialized needs or the development of fertilizer use technology in new land areas.

3. There is no competition in the market for fertilizer and no alternative sources of supply. This leads to a lack of incentive to improve the level of service to farmers and also to the danger of market supply interruptions such as stock outs or lack of product choice.

4. The system suffers from poor product quality, particularly in phosphates and in end user protection. The public sector factories, assured of selling all their production and guaranteed a given level of profit, have no incentive to improve efficiency or product and packaging quality. PBDAC has no authority to demand from domestic producers that product or packaging meet certain specifications, though it should be pointed out that attempts to do this are being made. PBDAC does have this ability with regard to imports, although constrained to some extent by the USSR protocol trade. PBDAC appears to have adopted a policy of quantity over quality in order to stretch the foreign exchange allocations. Under the prevailing circumstances this may have been the correct policy, but it has done little to improve the overall level of fertilizer quality.

5. Although PBDAC has the opportunity to optimize product distribution there appears to have been little attempt to apply pressure on domestic factories or other government authorities to utilize the lowest cost modes of transportation. This optimization opportunity may not provide large savings per ton but from a national perspective there are opportunities for considerable savings. In the latest contracts it is stipulated that 50% of product transported to Upper Egypt from the Delta go by rail.

6. The subsidized pricing system has distorted the product choice decisions of farmers while attempting to provide incentives for nitrogen products which are technically preferable.

7. The restricted quantities of fertilizer available combined with the inadequacies of the allocation system have created

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and sustained an active black market in fertilizer that in turn raises the average fertilizer cost.

8. The control of credit through the provision of in-kind credit has also sustained the black market as a means of acquiring low cost short term cash credit.

9. The provision of fertilizer without technical advice at the point of sale, other than the official recommended rates of application, and the lack of demonstrations and field days for farmers, have added to the general inefficient use of fertilizer and below optimum yield achievement.

10. In spite of the potential benefits of national planning in achieving efficiencies in procurement, distribution, and pricing, the current system is unnecessarily complicated with bureaucratic planning and approval procedures. The increased ex factory prices and changes to the subsidy payment system in January, 1988, for example, were not fully reflected in the official retail prices until August of that year, causing a substantial and unnecessary increase in subsidy payments.

11. With past restrictions on supply there has not been the necessity to develop a reliable forecasting system and none exists as such, but when domestic supply is increased in 1991 from the Abu Qir plant and later from Kima the need for a good demand forecasting system will be paramount.

12. PBDAC management information systems to provide analysis of individual product profitability, cost analysis of individual distribution elements, and overall financial management are lacking, in part due to the entirely manual record system but also apparently because of the lack of incentive to improve efficiencies as subsidy payments and the method of commission calculation cover all deficiencies.

13. Finally PBDAC has not been encouraged or allowed to make provision for adequate maintenance of existing storage facilities or investment in new facilities but is now considering substantial investments that may not be necessary, whether or not PBDAC maintains a monopoly position in fertilizer distribution.

Options for Privatization

2.67 The supply of fertilizers to farmers should be an integral part of the continuing policy reform process of liberalizing the agricultural sector. The Government of Egypt's intention to initiate a privatization process for fertilizer distribution and marketing requires that the objectives of privatization be clearly established and understood from the outset. There are four

categories of objectives to be considered:

- The security of agricultural production;
- The future role of the government and its agencies;
- The expected role of the private sector; and
- Implementation timing and phasing.

2.68 The Security of Agricultural Production. It is recognized that the GOE may wish to continue its role in securing production of cotton, sugar and rice through controls on production, field operations, and pricing. For other crops the introduction of free market and floor prices and the lifting of direct cropping controls have ensured that the essential requirements to maintain production are the supply of fertilizers and other inputs on a timely basis to all farmers at prices which allow their rational and efficient use, and the continued development and improvement of technology transfer to farmers. There is sufficent evidence that these requirements can be met in a privatized system. The impact on farm crop enterprise budgets has been demonstrated to be minimal.

2.69 The Role of Government. The premises for considering the future role of the Government in Egypt's fertilizer sector are that:

- The legitimate role of government is to provide and foster the circumstances for the development of private sector competition and provide such regulation as is necessary for the protection of consumer interests from possible abuses within a free enterprise system, to support agricultural research and extension, and to protect the productive resource base of the agricultural sector.
- The procurement, distribution, and marketing of fertilizer is not a necessary function of government through its agency, PBDAC, once there is adequate supply so that allocation is no longer necessary.
- The manufacturing sector will continue to be owned and controlled by the government through the CIO.
- The particular circumstances in Egypt require the Ministry of Agriculture to continue the administration of the block cropping system at the village level but not the enforced allocation of fertilizer requirements to farmers once sufficient fertilizer supplies are available.

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2.70 In other countries where privatization of government controlled fertilizer distribution and marketing has been attempted, but no clear future role of government defined, there have been a lingering presence of government involvement and disruptions to private sector activities which undermined the confidence of the private sector and the operation of market forces.

2.71 The establishment of free enterprise competition, with minimal controls, that adds value in varying degrees through the marketing process and provides incentives for efficiency in operation is the basic concept for the role of the private sector.

2.72 The consultant believe that the private sector in Egypt potentially has the capability to procure, distribute, and market fertilizer to all the farmers in an efficient manner and with a reasonable level of profit and, provided there are certain initial controls, can accomplish this without adverse consequences to the farmers.

2.73 Implementation Timing. Considerable progress has been made by the GOE in the past two years in liberalizing the agricultural sector. All crop prices, except cotton, sugar cane and rice, are currently free market prices, and direct fertilizer subsidies have been substantially reduced. There are still considerable barriers to free markets in farm inputs, such as price control, which will need to be removed to move to a completely free system. The complete removal of subsidies on inputs is not , however, necessarily a requirement for privatization, although such a move makes privatization more easily accomplished and administered. More important is the question of price control per se and the lack of development of the private sector in fertilizer marketing.

2.74 Experience in other countries with similar fertilizer sector supply structures, relying on domestic and import supply, has shown that the essential prerequisite for privatizing the fertilizer sector and allowing market forces to determine prices is an adequate supply of fertilizer at all times. The importance of this factor can be illustrated. A shortage of fertilizer at a crucial planting or side-dressing period, which often is only for a few weeks, can lead to unfilled demand at the local level forcing prices upwards to the detriment of farmers.

2.75 Avoidance of these risks will require the adequate total availability of fertilizer in the country, and the ability of the sector to quickly replenish stocks at the retail level in response to unforeseen upsurges in demand. It is the consultant's premise that the total availability of fertilizer in Egypt will be more than sufficient to meet demand by 1992 and that the distribution facilities can provide sufficient fertilizer to any location within

two or three days.

2.76 The virtual absence of the private sector from fertilizer distribution and marketing and its restriction to specialty products plus the absence of formal private sector distribution channels for fertilizer to the retail level preclude the immediate and total transfer of fertilizer distribution to the private sector. It is the consultant's premise that this transfer will need to be phased in over a period of time to allow the private sector to build and develop marketing channels.

2.77 Consideration needs to be given to the setting of clear objectives for the phasing in of privatization. Choices exist between phasing by specific functions, e.g. importing; by location, e.g. selected governorates; or by a total national policy of gradual replacement of PBDAC, in part or completely, over a period of time. It is the consultant's basic premise that the latter choice provides the most rational objective.

2.78 Options. The options for privatization fall into three categories:

1. The closure of PBDAC's input supply function and its complete replacement by a number of private firms;

2. The divestment of PBDAC's input supply functions within the public sector with private sector competition; and

3. The establishment of a private corporation to take over all the input functions of PBDAC.

2.79 Option I is recommended by the consultant, primarily because once there is an adequate supply of fertilizer without subsidy there will be no further justification for allocation and subsidy administration and thus no justification for a continued role by PBDAC in administering the allocation system. Option I is a phased withdrawal of the GOE from fertilizer distribution and the complete replacement of this function by the private sector.

2.80 In Option II the intention would be to separate the supply activities of PBDAC into an autonomous government corporation run as a commercial enterprise in competition with the private sector. This would require the new organization to operate under the same or very similar conditions, to the private sector without preferential treatment, conditions or favor so that its future viability would be entirely related to merit, an unlikely supposition.

2.81 Option III entails the divestment of PBDAC's input supply operation business to the private sector, in part or in whole, and allowing other private sector interests to enter the market in

competition with the divested company.

2.82 Before considering the merits of the three options in some detail it is appropriate to restate the current and likely future conditions applicable to the fertilizer sector. These are:

- Total supply is constrained by the level of domestic production and foreign exchange to purchase sufficient imports to meet demand.

- Domestic production is currently 90% of total N supply and 100% of P2O5 supply, while all K2O is imported.

- By 1992 there will be sufficient domestic N supply to meet expected demand with the commissioning of Abu Qir AN plant. This supply will be further augmented by the increased Kima capacity at more economic production levels.

- Currently planned investments in nitrogen production involving rehabilitation will allow domestic production of nitrogen to be made at or below world prices by the mid 1990's.

- Current investment programs in the phosphate sector will increase the supply and improve the quality of domestic phosphate fertilizers by the mid 1990's.

- Importation of AS may continue to meet demand for this product, leaving room for export of other nitrogen products, most likely urea.

- Complete subsidy removal will not have a significant effect on crop production gross margins and could be offset by small increases in the prices of controlled crops or improvements in use efficiency or both. For some products a phased withdrawal of subsidy will be required to avoid large market disruptions.

- From the mid 1990's there can be a change from a supply driven market to a demand driven market. The actual level of demand, freely expressed, is very difficult to quantify but is expected to be slightly higher than the present usage.

- Under the current allocation system of inadequate supplies there is an active black market which can be expected to disappear once there are no restrictions on farmers' purchases.

- The supply of credit to farmers is administratively linked to allocations, but with the removal of

allocations these linkages can and should be broken so that farmers have access to credit for input purchase from any source.

- There are currently legal, financial, and administrative impediments to private sector involvement in fertilizer distribution and marketing that need to be removed if the private sector is to develop its capacity to perform these functions either in competition with PBDAC or in competition within the private sector alone.

- Due to the present restrictions placed on the private sector there is a need for a gradual phase-in of the private sector in order to allow companies to develop marketing channels.

2.83 In summary the time is right for the phased introduction of the private sector so that by the early 1990's a free, demand - driven market can be operating successfully with benefits to farmers through reduced distribution costs and/or improved levels of service. In all three options listed above the commonality is that the private sector must be allowed to operate in the market under the same terms and conditions as PBDAC. Without this condition the private sector will not participate.

2.84 Consideration was given to the options described and considered in the Agricultural Policy Analysis Project Report which examined the areas of entry of the private sector and recommended price reform and then a gradual introduction of the private sector at the retail level. The options considered here and the recommended implementation program differ significantly from these earlier recommendations in both the timing and level of entry. The retail area is the least developed private sector area and it is considered here that by concentrating initially on wholesale distribution that the deficiencies in alternative retail channels will be more quickly resolved.

Option I

2.85 This phased withdrawal option capitalizes on the developing supply situation, and the interest of the private sector, It can meet the interests of farmers, national productivity objectives. It clearly states the government's intention to withdraw from fertilizer distribution within a given time period and in a way which will cause minimal disruption to the fertilizer market.

2.86 The requirements for this option are the removal of all fertilizer subsidies within 5 years and all retail pricing controls and allocations by 1992-3. Its objectives are to:

- Remove the government from fertilizer distribution within seven years;

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- Provide the private sector with the opportunity to participate in fertilizer distribution immediately;
- Ensure that the private sector takes over the fertilizer distribution and marketing functions completely within seven years;
- Develop market force competition ultimately between the manufacturing companies; and
- Provide a safety net via the existing PBDAC organization during the initial period.

2.87 It is proposed that the following specific sequence of events should be implemented starting in the 1989-90 financial year:

1989-90 Year 1:

Announce the intention of PBDAC to withdraw completely from fertilizer distribution by no later than July, 1997.

1990-1 Year 2:

Reduce the availability of fertilizer allocations through PBDAC to all farmers by 15%.
Allow the private sector to distribute 15% of all fertilizer and participate in fertilizer importation in competition with PBDAC.
Allow the private sector to import and distribute all specialty fertilizers.

1991-2 Year 3:

Reduce the PBDAC allocations by a further 15% and increase the availability of fertilizer to the private sector by the same amount.

1992-3 Year 4:

Remove all allocations, price controls, and restrictions on private sector procurement.

1992-7 Years 4-8:

Progressively withdraw PBDAC from the market.

2.88 This straight forward time table of events will require considerable and complex changes to be made within the sector to achieve the desired objectives. These changes will require

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comprehensive policy initiatives and action plans. Recommendations on these are set forth below, categorized by operational areas.

Recommendations for Implementation and Operation

2.89 Allocations. The block cropping controls and national and village level cropping programs are recognized as essential elements for certain technical crop management practices and should be continued. Fertilizer allocations should be discontinued in the 1992-3 financial year, starting with the winter cropping program. In the transition from an allocated market to a free market, consideration needs to be given to the political sensitivity of how and when further allocations should be removed to allow private sector participation.

2.90 There are three alternative approaches for the implementation of Option I. The simplest and softest line of approach would be to delay privatization until sufficient fertilizer supplies are available and fertilizer subsidies are removed. Admittedly, this would protract the privatization process and act counter to the liberalization of crop prices already in progress. Under this alternative, MOA would not increase the present fertilizer quotas. Neither would PBDAC sell fertilizer over and above the presently established quotas. All over-quota fertilizer would be imported and distributed by the private sector. Once fertilizer is available in sufficient quantities in about 1992/3 and subsidies have been removed the fertilizer quotas distributed by PBDAC would be reduced and an equivalent quantity would be sold to the private sector for distribution and sale. Obviously this would postpone privatization of fertilizer distribution by about four years. Under the alternative, MOA would announce the following program in August 1989. Beginning in 1990 subsidies for fertilizer will be reduced by 25 percent. Further reductions of 25 percent will take place so that by 1993 there will be no further subsidies. This involves the elimination of the preferential exchange rate for fertilizer imports, the implementation of actual costs of production in arriving at sales prices for domestic production, and the elimination of all budgetary subsidies for distribution and sale of fertilizer. In 1993, when all subsidies have been removed the allocations will be abolished and PBDAC will reduce its sales to 3 million tons to be followed with further reductions of 0.5 million tons in successive years depending on the interest, willingness and capabilities of the private sector to distribute fertilizer. It is to be expected that as subsidies are gradually removed and the differential between the subsidized and the free market price narrows, there will be greater incentive for private sector participation in the importation and sale of fertilizer and the establishment of its own distribution network for this activity.

2.91 Another approach would be to maintain allocations for the

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major field crops: cotton, wheat, rice, maize, and sugarcane, until 1992-3. This allocated fertilizer would be available through PBDAC only and all other crop fertilizer allocations would be reduced or removed to provide the private sector access to a maximum of 40% of the fertilizer supply.

2.92 A further alternative may be to reduce the allocations for high value crops only, such as vegetables and fruits. This would allow the availability of fertilizer for private sector distribution to around 20%.

2.93 Subsidies. All direct subsidies for nitrogen and phosphate fertilizers should be removed by 1993 and for potash fertilizers by 1995, progressively removing existing subsidies by equal annual installments. The method of subsidy administration should revert to payments to the manufacturing companies, either directly or through the CIO, and to the importing companies on the basis of a subsidy per ton applicable to the cif value.

2.94 Procurement Pricing for PBDAC. The CIO should continue to recommend ex-factory prices based on the current or a similar basis of production costs plus. Until 1993 the ex-factory prices for the same product should be equalized on a weighted basis so that all domestic AN, for example, has the same ex-factory price. The CIO should be administratively responsible for the reallocation of revenues to factories as per the annually agreed production cost-plus formula. Until 1993 PBDAC should procure its domestic allocations at the ex-factory equalized prices. After 1993 it is proposed that PBDAC secure its supplies at prices freely negotiated with individual factories and the equalized product pricing system be discontinued.

2.95 Procurement Pricing for Private Sector. During the coming year expressions of interest should be invited from the private sector for the purchase and distribution of 15% of each individual manufacturing company's expected 1990-1 output on the basis of competitive tenders, subject to minimum and maximum annual quantities and minimum load off-takes. For valid expressions of interest by the private sector, pre qualification of individual companies should examine demonstrated financial and organizational capability to distribute the requested quantities of fertilizer. In the event of over-subscription to the private sector allocation, the highest bidder(s) would be awarded the full quantity requested and subsequent amounts awarded to the next highest bidder(s). In the event of under subscription by the private sector the unfilled quantities would revert to PBDAC at the set ex-factory price. During 1990-1 further invitations would be issued to the private sector for pre-qualification for distribution of the private sector allocation for 1991-2, again on a bid basis. From 1992-3 onwards the pre-qualified private sector companies would be free to tender for any quantities at each factory and no barriers other than normal pre qualification requirements would be placed on new

private sector entrants. It is proposed that revenues in excess of the set ex-factory prices during the initial phase-in period, arising from the private sector bids, be utilized by CIO for investment in plant improvements for the benefit of the sector as a whole.

2.96 Retail Prices for PBDAC. Until 1993 PBDAC would sell its share of fertilizers at fixed retail prices but the pricing system would be changed to an area pricing system that reflected the ex-factory prices plus the actual cost of transportation to each governorate and locality within each governorate. The regional prices would be set to provide PBDAC with sufficient margin to cover operating expenses and aggregating 85% of the 1987-8 profit level in real terms and the payment of commission would cease. From 1993, after PBDAC changes its procurement from a fixed price to a tender price, PBDAC would be free to set its own prices in competition with the private sector.

2.97 Retail Prices for the Private Sector. From the first entry of the private sector into fertilizer distribution each company should be free to set it's own prices and sell in any locality.

2.98 PBDAC Distribution System. It is recommended that PBDAC's commitment to privatization of fertilizer distribution would be served by offering terms and conditions to the private sector for use of PBDAC's warehouses, shounas, and mandubias on a storage charge and handling fee basis during the transition period to full private sector involvement. After 1993 during the progressive withdrawal of PBDAC from the market the facilities owned by PBDAC should be offered for sale to private sector companies involved in fertilizer distribution. In the event of failure to sell these facilities PBDAC should offer them for lease to the same parties and as a last resort offer them for sale on the open market.

2.99 The question arises of whether the GOE should go ahead with the proposals for new storage warehouses at shounas using a World Bank loan for this purpose. It is recommended that this option should be reconsidered in the light of the proposed privatization option recommended here. Consideration should be given to increasing the storage capacity at manufacturing sites and assisting the private sector to invest in large regional warehouses at strategic centers. Improvements to storage facilities at many shounas should be restricted to low cost improvements that can be fully amortized. Greater attention should be paid to improving fertilizer packaging.

2.100 Role of the Cooperatives. The cooperatives have had a traditional role in fertilizer distribution for their members which was taken over by PBDAC and to which there is currently a concession made through the 5% discount PBDAC provides to cooperatives. In the private sector proposal recommended here it is envisaged that the cooperatives could resume their participation

in the sector either by purchasing fertilizer from private sector distributors at the wholesale level for supply to village members or by participation in procurement and distribution at the governorate or regional level. The replacement of the current funding of cooperatives via the fertilizer discount would need to be addressed.

2.101 Import Supply. Until such time as foreign exchange for imports is not a constraint it is recommended that an annual allocation of foreign exchange be made available for imports determined in the current manner. The private sector should be allowed to compete for tenders in competition with PBDAC for the supply of imports, other than counter trade AS from the USSR, acting as import agents for PBDAC so long as the preferential rate is operative. It is also recommended that successful tenderers should be provided with access to the foreign exchange reserved for fertilizer imports and that the preferential exchange rate for fertilizer imports be eliminated by 1991. It is further recommended that the tarrif of 10% on imported fertilizers and sulfur be removed.

2.102 Specialty Fertilizers. Specialty fertilizers for drip irrigation and other specialized needs should be left entirely in the hands of the private sector, free to import at full exchange rates and with access to foreign exchange in the total national fertilizer allocation. This may only be an interim measure as steps are being taken to develop some domestic capacity for such products.

2.103 Exporting. It is recommended that the private sector tender for the export of surplus nitrogen fertilizer, when available.

2.104 Credit. The supply of credit to farmers linked to allocations is an integral part of the current system. Fertilizer credit has been heavily provided on an in-kind basis tied to supply of allocations. Under the privatization option recommended PBDAC will need to address the supply of credit for cropping inputs. The use of credit vouchers is not recommended as there is a danger that these could become tradable items. The provision of cash credit or alternatively the payment to retailers on presentation of signed receipts of fertilizer supply to individual farmers should be considered. In this latter alternative it is envisaged that farmers' individual accounts would be debited by the Bank when retailers are credited. Credit control could be exercised in a similar manner to the current system with the clearance of crop credit accounts before further credit is issued.

2.105 Transportation. It is recommended that the private sector national and regional distributors be allowed to use whatever means of transport is available and that individual companies contract with public or private sector transport companies on a competitive basis. It is envisaged that the private sector distributors will

utilize to the fullest extent possible the lowest cost means of transport including the savings that can be made through back hauling. It is also envisaged that the private sector will be able to make greater economies in transportation over longer than shorter distances and that such savings will provide a further incentive to distribute product to more distant areas.

Option II

2.106 This divestiture option requires the establishment of an independent government corporation. The corporation would be established by the transfer of the staff and fixed and current assets of PBDAC associated with fertilizer and other agricultural inputs distribution from the existing PBDAC organization.

2.107 The establishment of this organization and its separation from PBDAC would take considerable time, effort, and expense and almost certainly require an infusion of new capital in order not to dilute the asset base of the remaining banking functions of PBDAC. It is estimated that it would take two years for such an organization to become operational, independent of PBDAC.

2.108 By this time the fertilizer supply situation would be rapidly approaching the supply position that could support a free market -- a condition that would no longer necessitate direct government involvement in fertilizer distribution. During the intervening period required to divest the input operations from PBDAC, the private sector would be hesitant to enter the market due to the lack of visible evidence that the government is committed to allowing the private sector to operate on a free and equal footing with the new PBDAC organization.

2.109 It is believed that any delay in the involvement of the private sector would be detrimental to its successful entry; during any period of delay PBDAC would be continuing in a non - competitive environment.

2.110 If this option were pursued it is likely that the operating costs of the new PBDAC organization would be similar to existing levels. Any erosion of market volume due to competition from the private sector would result in increased costs per ton of fertilizer distributed; cost reductions would be difficult to achieve due to the high labor component in the cost structure. Under these circumstances there would be a great temptation for the management of the new PBDAC to turn to the government for financial or regulatory assistance, an avenue denied the private sector. In the event the new PBDAC organization should not be able to compete successfully with the private sector without receiving assistance from the government its demise would create a need for compensation for the public sector employees, cause a loss of the establishment costs, and reflect poorly on the government.

2.111 An approach addressed to this particular aspect would be to divest the PBDAC distribution operations into several regional companies in order to encourage competition between them. Several problems are foreseen with this approach. The pool of managerial expertise within PBDAC would be diluted; the newly divested companies would involve a duplication of public sector organization overheads; the companies would not necessarily enter into competition; and the time delay in formation of several companies would be greater than that involved in setting up one company.

Option III

2.112 Privatization of the PBDAC fertilizer distribution function involves the sale to the private sector, either completely or in part, of the equivalent of the divested organization referred to above. To be attractive as an investment to the private sector, whether as a whole or in parts,the business has to be profitable or potentially so or assets undervalued. In the case of PBDAC the fertilizer business is already profitable but its current role as an agency for the government precludes its attractiveness to the private sector. Likewise, the government would be unlikely to find it attractive to have the private sector acting as its agent. In addition the over staffing of PBDAC compared to private sector norms would make the business very unattractive to the private sector. The major assets of PBDAC for potential fertilizer distributors are the storage areas, warehouses, and mandubias situated throughout the country. However the purchase of these assets at market value would not appear to be an attractive proposition, as the land values are very high and the improvements minimal and the alternative of leasing storage facilities and developing alternative channels offers a lower cost route for the private sector.

2.113 This is not a viable option. Not only is the time delay required for it to be put into operation unacceptable but there is really nothing to privatize.

The Pivotal Issues

2.114 The radical changes proposed in the recommended privatization option for fertilizer distribution center on the leveling of the market conditions to enable the private sector to enter and crucially on two aspects: the change to area pricing and the availability of adequate supplies of fertilizer. Without either of these conditions in place the proposed option will not work. The time-table set in this proposal is based on current information on the investment plans for the manufacturing companies. This schedule may have to be modified in the light of available supplies during the implementation; this could be done by extending the period of allocations.

2.115 Preliminary calculations on the impact of area pricing show that the major effect will be on urea prices in Upper Egypt which represents the highest current distribution cost. The regional spread in urea retail pricing can be expected to be on the order of LE 20/t between the Delta and Upper Egypt. It is recommended that a full distribution and area-pricing study be considered prior to implementation of these proposals and together with a re-examination of distribution storage requirements.

2.116 Egypt's farmers are committed users of fertilizer and fertilizer use is thoroughly established as a necessary farm production tool. The PBDAC fertilizer distribution and allied credit system have been a significant force in achieving this commendable position. With the anticipated increased supply of fertilizer from domestic production the private sector may now fulfill a role in a free market system that will be an integral part of continuing policy reforms and beneficial to farmers and the agricultural sector.

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The Seed Subsector

2.117. This section describes the supply of seed to farmers. In doing so it characterizes:

- The proportions, composition, and sources of supply;
- The respective roles of PBDAC and other public agencies and of the private sector in supplying seed needs;
- The nature and extent of subsidies which accrue to farmers in connection with seed purchases; and
- The options for privatizing PBDAC's input supply activities in this subsector.

2.118. The total requirements of Egyptian farmers for seed are very large. The Ministry of Agriculture estimates that, on a 100% annual replacement basis, total seed requirements would amount to some 600,000 metric tons (MT).[1] The volume of seeds actually entering formal commercial channels of distribution, including those of PBDAC, is a much smaller figure, probably 200,000 MT or less. The proportions of the informal channels are not known, but are very large indeed; these channels include retention of seeds for on-farm use or sale to other farmers or local merchants by the farmers themselves. Informal seed production (operating without government regulation or certification) plays a significant role in Egypt. It is reported, for example, that one third of the rice seed and one half of the wheat seed used in recent years were produced in the informal sector. In the case of one major fodder crop, Egyptian clover, the quantity produced is immense; trading, however, centers on informal channels. although a modest export of seed has been developed by Egyptian producers and merchants.

2.119. The treatment of the seed subsector that follows however, focuses on the formal sector. For descriptive and analytical purposes it is convenient to treat vegetable seeds separately from those for other crops, hereinafter referred to as field crops. There are three reasons for proceeding in this fashion.

2.120. First, it is apparent, as the remainder of this section will show, that the private sector is much more active as supplier of vegetable seeds to both intermediaries and end users than is the case with field crops. Second, farmers receive subsidies for seeds only in the case of selected field crops, but not in the case of vegetable seed. Finally, seed for field crops are the responsibility of the Seeds Department of PBDAC's Inputs Division;

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[1] See Abdel S. Gomaa, Ahmed Momtaz, and Bill Gregg, "The Private Sector in Egypt's Seed Supply." September, 1987.

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vegetable seeds are the responsibility of the Agricultural Chemicals Department of the Commercial Affairs Division.

Field Crop Seed

2.121. For present purposes field crops include principally those listed in the accompanying Table II-1. This table shows, by field crop, the quantity and value (in terms of prices to farmers) of seed distributed through PBDAC's Inputs Division and supply network in the fiscal years 1986-7 and 1987-8. Based upon these figures and estimates of the Ministry of Agriculture of seed used in 1987-8, it is evident that for major field crops PBDAC is very nearly the sole supplier to end users. The following tabulation compares the Ministry's estimates of supplies with PBDAC's reported distribution.

Crop	Estimated Use (MT)	Supplied By PBDAC (MT)
Cotton	100,000	66,625
Wheat	50,000	53,005
Rice	50,000	38,356
White maize	14,000	12,478
Barley	2,000	768
Local beans	7,000	9,469
Lentils	1,000	828
Soy beans	5,000	4,135
Sorghum	2,000	--
Total	231,000	185,664

Source: Abdel S. Gomaa, Ministry of Agriculture.

2.122. In the case of white maize, the private sector figures prominently as a source of supply, although their products are distributed in considerable measure through PBDAC's channels. In the case of other crop seed listed above and in Table II-1., PBDAC is the principal source of supply through formal distribution channels.

2.123. With the exception of some of the white maize distributed with private sector participation, field crop stocks of breeder and foundation seed are supplied by the Agriculture Research Center (ARC) of the Ministry of Agriculture. ARC is also charged with the production of foundation and registered seed on state farms. The Ministry's Central Agency for seed (CSA) in turn has responsibility for planning seed production, contracting for testing, and certification. PBDAC finances MOA contracts with private farmers

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for the production of seed stocks which, under the supervision of CSA, are conditioned and returned to PBDAC for distribution through its own channels. The costs incurred for the processing, handling, and distribution of seed stocks are recovered through prices charged to farmers. Prices to farmers, however, are determined by the Ministry of Agriculture, and may be set below costs, with the consequent need for a subsidy chargeable against the Agricultural Stabilization Fund. Some seed conditioning is performed by plants owned and operated by CSA; the greater part, however, is carried out by public and private sector plants operating under contracts negotiated and administrated by MOA and financed by PBDAC. Reportedly only three of the 16 seed processing plants are operated by the private sector.

2.124. Prices for registered seed supplied to contract growers are determined by the Ministry of Agriculture, as are the prices paid to contract farmers for raw (unconditioned) seed. Raw seed and conditioned seed are subject to inspection by the Ministry of Agriculture in company with PBDAC personnel. PBDAC serves as agent for the Ministry of Agriculture, in effect selling seed consigned to it by the Ministry, including PBDAC's commission as consignee.

2.125. Imports account for a very small proportion of the field crop seed available to farmers. Current and recent past imports have included seed for sugar beets (all imported, by public agencies), potatoes (for a union of potato growers), sunflower, and soybeans, the latter two by the Agricultural Research Center of the Ministry of Agriculture. One private company brings in its own foundation seed for white maize and its own seed for certain other crops.

The Private Sector Role: Field Crops

2.126. Except for very limited seed processing and the raw seed production contract growers, the role of the private sector in field crop seed is relatively minor and currently focuses principally upon white maize seed. Five organizations engage in the production and supply of white maize seed, one of them the Agricultural Research Center. The estimated division of this production among the public and private producers is as follows: Agricultural Research Center, 3,000 MT, of which almost all was parent seed used by private companies to produce commercial seed. The four private companies together produced approximately 14,000 MT. Of the four private companies, three make use of Egyptian hybrids, while the fourth imports and produces parent stock. The four private companies use contract growers as well as their own farms. Two companies import other hybrid field crop seed including forage and grain sorghum, alfalfa, and millet. With three of the four private companies, other agricultural input product lines are produced/imported and distributed; such product lines include foliar fertilizer and hybrid forage and vegetable seed.

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2.127. Two of the four private companies sell some white maize seed directly to farmers and all four distribute through PBDAC. The Ministry of Agriculture estimates that only about half of the white maize seed planted is produced by private companies with the remainder largely provided by farmers themselves. The hybrid white maize seed of private companies are not, however, competitively available through PBDAC channels: reportedly, PBDAC determines which governorate(s) will be the locations for the distribution of the products of individual companies.

Vegetable Seed

2.128. The dimensions of the total supply of vegetable seed, whether local varieties or imported hybrids, are not precisely known. The Ministry of Agriculture's estimate of "total requirements" of vegetable seed at 100 percent replacement was set at some 7,500 MT in 1986-7. One private sector company engaged in the vegetable seed business estimates the national vegetable seed trade, including seed for peas and beans, at 4,000 MT. In very general terms it seems likely that informal local production and distribution, primarily if not wholly of local varieties, account for a very large proportion of the total supply.

2.129. Available information about PBDAC as supplier of vegetable seed indicates, for the current (estimated) and the two preceding years, total sales as follows:

Year	Sales (MT)	Varieties
1986-7	12.3	Imported: tomato, cucumber, carrot, cantaloupe, pepper Domestic: squash, watermelon, musk mellon, Egyptian clover.
1987-8	7.25	Imported: tomato, cucumber, carrot
1988-9	11.0	Imported: tomato, cucumber, carrot, bell pepper, hot pepper, cabbage, cantaloupe.

Source: Commercial Affairs Division, PBDAC.

Reportedly, 1986-7 was the first year in which PBDAC engaged in sales of private sector supplied vegetable seed. Its substantial projected sales increase for the current year is attributed to the reported eagerness of private companies to market through the Bank. PBDAC handles stocks of vegetable seed on a commission basis.

The Private Sector Role: Vegetable Seed

2.130. Supplies of vegetable seed provided by private companies are not known. In the aggregate, they may be a large and even expanding business. Reportedly some 25 or more companies are engaged in distributing imported vegetable seed, directly to producers, through private merchants, through PBDAC, or in some combination to the three types of outlets. It appears that five or six private companies account for 65 to 70 percent of the trade, while the public Egyptian Agriculture Organization reportedly accounts for about 25 percent. The larger private companies assert that they provide technical assistance to producers through their distribution personnel. These companies have other agribusiness lines. Distribution directly and through local merchants is largely confined to lower and middle Egypt. Sales may be in cash, with or without discount, or by short-term credit extended by the companies themselves. Credit is available for producer purchases through PBDAC, as is credit for private companies supplying imported vegetable seed through PBDAC.

Subsidies and PBDAC Finance in the Subsector

2.131. State subsidies for seed supplied to farmers are confined to their purchases of field crop seed, except as subsidies are inherent in the extension of credit through PBDAC's banking operations to farmers and agribusiness firms. Indirect subsidies, such as those involved in the support of research and seed operations of the Ministry of Agriculture and in the operation of state-owned seed processing plants and transportation services, may be considerable. These latter types of subsidies, however, are beyond the scope of the present study.

2.132. Direct subsidies for field crop seed for farmers vary widely, depending upon the crop involved. The largest subsidies may be those for cotton seed; such subsidies, however, are not reflected in payments to PBDAC.[2] For other crops, the relation of subsidy to total price to farmers varies with the crop. The accompanying Table II-2 presents summaries of cost elements for subsidized field crops in the 1988/89 cropping year.

2.133. These figures are not believed to be a typical of practices of the recent past except as subsidies have been reduced. Total direct subsidies for seeds distributed by PBDAC in fiscal 1987-8 amounted to LE 4,250,000 according to the reports of the Agricultural Stabilization Fund. According to figures for

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[2] PBDAC sources have emphasized to the consultant that cotton seed are heavily subsidized. The CSA reports the belief that the price of cotton seed at the gin is far below actual cost.

fiscal 1987-8 obtained from the manager of PBDAC's Seed Department, the subsidy totaled LE 3,037,833 (See Table II-2).

2.134. In contrast with its experience with other categories of inputs, the financial results of PBDAC operations in supplying seed to farmers fail, on average, to contribute to PBDAC's net income. The tabulation below shows four years' results in rounded amounts of PBDAC's seed supply operations, including direct and allocated indirect costs.

Year	Income	Expense	Profit (Loss)
	(Figures in LE 000,000)		
1987-8	5	5	0
1986-7	4	4	0
1985-6	3	4	(1)
1984-5	2	2	(-)

Source: Rounded, from PBDAC annual financial statements.

2.135. The explanation of PBDAC's essentially negative results in profits from seed operations may be found in the modesty of its commissions in relation to the multiple transactions involved in distributing raw seed to contract farmers, recovery of the seed, paying the farmers and seed processors, as well as distributing the seed for production purposes.

Governmental Responsibilities for Seed

2.136. There are indispensable responsibilities for government in relation to seed supplies. These responsibilities minimally include:

- Conducting and encouraging others to engage in broad research programs which serve to identify and evaluate crops and seed suited to local conditions and to strong support of a flourishing agricultural sector;

- Developing and evaluating breeder and foundation seed stocks reflecting the results of research;

- Exercising at least sufficient supervision over the production and labeling of registered and certifies seed to assure that seeds of high quality are available and that plant diseases are kept in check; and

- Providing an environment which affords to farmers the bases and opportunities for product choice among types

of crops and varieties of seed and favors optimal farmer use of the types and varieties he selects for production purposes.

2.137. To satisfy these requirements, the Government of Egypt maintains large staffs and extensive facilities, among them those of PBDAC. The Bank is the instrumentality through which the government makes available seed for farmers. Varieties of field crops available through PBDAC are entirely limited to those which the Ministry of Agriculture has determined to be most suitable for agricultural production in given areas. Thus, farmer field crop choices among varieties if not of crops is otherwise left in small degree to the private sector or to informal sources of supply. In response to farmer demand and as a convenience to private sector companies, however, PBDAC on a consignment basis acts as a distributor of selected seeds, primarily vegetable, on behalf of private companies.

2.138. Restrictions on farmer choice, other than those inherent in the system of controlled cropping, may be more significant than would appear evident at first glance. It has been reported that governmental standards for registered and certified seed are not fully maintained to high standards of quality and purity. Second, delays in payments to contract farmers together with a limited differential for contracts farmers' raw seed as compared with prices for produce may encourage the diversion of seed to the informal market, either as seed or for human consumption. Insofar as these conditions still exist in any significant degree, the farmer is denied the choice which could be available to him where several suppliers of certified seed compete for his patronage on the basis of demonstrated advantages in productivity and price/production ratios.

2.139. Available evidence about the behavior of Egyptian farmers indicates that they welcome and will use technical assistance when available. This is the case with Egypt's experience with the Small Farmer Production Project, where inputs have been designed specifically to cropping plans and their use has been supported by active extension service. This experience is supported by the stated readiness of private dealers in vegetable seed to support marketing with technical guidance and the positive reception accorded by farmers to such assistance.

2.140. PBDAC, then, is the supplier of seeds of prescribed types for field crops, with farmer choice left to the limited activity of a few private companies and more widely to the informal sector. In the case of vegetable seed, PBDAC is outside the distribution scene save as it accepts small quantities of seed derived from imports on a consignment basis as a convenience to dealers and in satisfaction of an expected increase in farmers' demand. This additional demand may well reflect an increased interest in vegetable crops by small farmers, for it appears that the needs of

larger farmers are in considerable measure satisfied by direct delivery from dealers.

2.141. It seems quite likely, therefore, that PBDAC's seed distribution activities exist largely to facilitate the attainment of the production plans of the Ministry of Agriculture rather than the needs of a highly productive agricultural sector driven by farmer self-interest.

Summary of Principal Findings

2.142. These are as follows:

1. Almost all field crop seeds sold through formal channels are produced by the government, except for most of the white maize seed.

2. All field crop seeds are distributed by PBDAC, with limited exceptions.

3. Seed provided to farmers are of inferior quality. Consequently, high planting rates are necessary.

4. PBDAC has no incentive to deliver seed efficiently. It merely delivers what is processed and sells the seed according to CSA's plan. PBDAC is paid for distribution whether or not the right seed reach the grower or the seed is sold. Leftover seed are sold as grain, without penalty to the Bank.

5. There is a direct subsidy for seeds of five crops distributed by PBDAC. Most of the subsidy accrues to wheat.

6. The farmer has limited choice among the field crops he may grow as well as with respect to varieties of seed.

7. Prices charged to farmers for certified wheat and rice seed have at times been below prevailing market prices for grain, with the result that farmers may choose to consume the seed or sell it as grain on the local market.

8. Three quarters of the total formal trade in vegetable seed in Egypt are accounted for by private firms. PBDAC's role in the distribution of vegetable seed is quantitatively negligible.

9. There is no element of direct subsidy in the sale of vegetable seeds.

10. Farmers have freedom of choice among the vegetable seeds

they may buy.

Privatization Options for the Seed Subsector

2.143. The ultimate goal of the Government is the complete privatization of the input and closely allied commercial and marketing activities of PBDAC. In the case of the distribution of seed, however, it is unreasonable to expect either (a) that the private sector will be interested in an activity limited only to the distribution of seed; or (b) that the private sector will make a significant contribution in seed distribution if it is not given the opportunity to engage in the production and sale of the seed it produces. The private sector's interest in seed distribution can be captured and sustained only if the seed a firm distributes are its own seed, produced under conditions the firm itself controls, whose quality it can assure, the advantages of which it can proclaim in a competetive environment, and the most productive use of which it can and, in that same environment, must make known to farmers.

2.144. Consequently, while the Ministry of Agriculture must take the lead in producing breeder and foundation seed suited to Egypt's special needs, and regulate the production of such seed by private firms, it must relinquish the production of registered and certified seed to the private sector. Having so relinquished seed multiplication for cropping purposes, the interest of the Ministry of Agriculture should then be limited to assuring that seed labeling provides correct and essential information to farmers about the contents of the container. In order to achieve this objective, the options set forth below are recommended.

2.145. Option I. The first option would proceed through the following sequential steps:

a. The Government would announce its intention of turning over to private firms and individuals the production and processing of registered and certified seed, and concomitantly would make foundation seed available to the private sector, both on a non-discriminatory basis. Prices charged for foundation and registered seed should be high enough to prevent the use of such seed for crop production instead of seed multiplication.

b. The Government would announce the complete privatization of the supply of white maize seed beginning not later than the summer cropping season of 1990.

c. Pending the private sector's production of its own seed supplies, the private firms would be permitted to distribute seed produced by the government. Such distribution should be started no later than 1991.

Tenders would be invited for these seeds, and they would be sold to highest bidders among prequalified firms in quantities large enough to be of interest and small enough to provide competition.

Initially such distribution would be of seed for two or three crops. Preferably these crop seeds should be those not currently subsidized by government; specifically those chosen for private distribution should exclude cotton, wheat, and rice seed until such time as the seed production and processing capabilities of the private sector have progressed sufficiently to permit economies of scale. Sunflower and soybean seed, when subsidy is removed from the latter, would be good choices for private sector production and distribution. Pending the establishment of private distribution networks, the government would, if necessary, allow private firms to lease space in PBDAC's storage facilities.

d. Based upon experience with private distribution of seed made available through the preceding steps, the role of the private sector would be expanded to include additional or all crop seed.

This option would afford advantages both to PBDAC and to private firms. PBDAC's supply system would be maintained intact at the same time the government could monitor the performance of private companies, evaluate performance and farmer effects, and on these observations determine the pace of further privatization would proceed. Such evaluations should center on the quality of private sector performance in developing seed production and marketing facilities and in providing services to farmers rather than quantitative measures of the volume and varieties of seed distributed. This initial period would permit private firms to develop seed production and processing capabilities, plan and begin to put in place a distribution network, and more generally evaluate the requirements and business implications of the new activity.

2.146. Other Options are variants of the foregoing. Central to all of them is the production of certified seed by the private sector. The initial step again would be announcement of the government's intention to privatize the seed subsector completely. The second option would look to the private sector for supply of all crop seed, but in two or three designated governorates rather than in all agricultural regions. The benefits for private firms and PBDAC would be similar to those indicated for the first option.

2.147. Further optional approaches, again variants of the first, would include (a) the involvement of the private sector nationwide

in the distribution of all seed; and (b) country-wide involvement of the private sector, but only at the retail level.
Basic contracts between present practices and those recommended are set forth below with respect to formal trade in field crop seed,

Present	**Recommended**
Seed production	Seed production
Breeder seed (MOA)	Breeder seed (MOA)
Foundation seed (MOA)	Foundation seed (MOA)
Registered seed (MOA)	Registered seed (MOA and Private sector)
Certified seed (MOA)	Certified seed (private sector)
Seed processing (MOA and private sector)	Seed processing (MOA and private sector)
Seed distribution (PBDAC)	Seed distribution (Private sector)

2.148. The foregoing options would require resolution of questions about interim sources, prices, and terms of delivery to private firms of seed supplies from the Ministry of Agriculture and the leasing of interim storage facilities for private distribution, Storage facilities might initially be provided free to private firms, with lease arrangements negotiated thereafter until such time as private firms might have acquired their own distribution facilities.

2.149. Answers to questions about sources, prices, and terms of delivery of seed supplies to private firms cannot be given in simple, uniform terms. This is because the appropriate arrangements would have to be tailored to the special requirements of individual firms, taking account of variations in their development of multiplication facilities (their own, farmer contracts), charges if any for supplies of foundation seed by the Ministry, the rapidity with which seed multiplication arrangements might be made, the availability to private firms of their own breeder or foundation stocks, and the time required for ministry approval of such stocks.

The Pesticides Subsector

2.150. This section describes the supply of pesticides (agricultural chemicals) used for crop protection in Egypt with special attention to the role and relationships of PBDAC. It then identifies opportunities for privatization of the supply of pesticides and examines relevant options.

General Characteristics of Pesticides

2.151. Agricultural chemicals, or pesticides, include acaricides, rodenticides, fungicides, herbicides, insecticides, and nematicides. Their uses are in controlling and/or preventing damage to crops by plant and animal species that impair agricultural productivity or damage or destroy harvested crops in storage. The range of these products is immense, as suggested by the fact that the Ministry of Agriculture has approved 247 different products for use in Egypt. Typically, these products are high in value, but comparatively low in measures of weight and volume compared with fertilizers, animal feeds, agricultural machinery, and even seed. The volume of agricultural chemicals supplied in the form of active ingredients and products ready for application is very small indeed: fertilizers total over 3 million tons, while pesticides amount to some 20 to 25 thousand tons annually. At world market prices, fertilizers used in Egypt represented an average of LE 263 per ton, for urea compared with LE 6,255 per ton for pesticides.

2.152. A further significant characteristic of pesticides is that they must be formulated with careful attention to their efficacy in selectively controlling the plant or animal species that may impair productivity and/or products without causing adverse side effects on humans, farm animals, other plants, or the surrounding environment. Thus, great care must be exercised both in selecting and in using pesticides. Finally, while hazards controllable through the use of pesticides may, on average, be forecast in approximate terms, there are always the possibilities of unexpected infestations and unforeseen genetic developments. The former may require a vast increase in protective uses of appropriate elements; the latter may result in the need to develop new formulations as products in use lose their effectiveness.

Supply Requirements and Use of Pesticides

2.153. The types, varieties, volumes, and costs of Egypt's needed agricultural chemicals have not been and probably cannot be stated with precision. They may be considerably beyond some measure of pesticides available currently and in the recent past. This is suggested by expert opinion and by comparing aggregate volumes available with requirements as set forth in MOA's cropping plans.

2.154. Recently the Managing Director of MOA's Central Administration for Pest Control, Dr. Yassin Osman, estimated that the 1987-8 provision of LE 55 million at the favorable exchange rate of LE 0.707 to $1.00 was sufficient for the purchase of only a third of the nation's pesticide requirements, all of the active ingredients for which must currently be imported. On the basis of this estimate, Egypt's "requirements" for the fiscal year past amounted to some $234 million.

2.155. There is a marked difference between the foregoing estimate of requirements and the supplies actually available and distributed through PBDAC. In order to arrive at the quantities available and supplied it is necessary to combine supply figures from two PBDAC sources, the Inputs Division (Pesticides Department) and the Commercial Affairs Division (Agricultural Chemicals Department). The Inputs Division distributes the Ministry of Agriculture's subsidized pesticides while the Commercial Affairs Division distributes pesticides owned by the private sector on a consignment basis.

2.156. The following tabulation provides data on the distributed volumes (in metric tons) and value (in terms of actual sales prices or, in the case of subsidized pesticides, the book prices to farmers) of products distributed by PBDAC in the fiscal years 1986-7 and 1987-8.

	Inputs Division		Commercial Affairs Division		Total Distributed	
Fiscal Year	Volume (MT)	Price (LE)	Volume (MT)	Price (LE)	Volume (MT)	Price (LE)
1987-8	17,152	105,766,161	2,569	17,580,283	19,721	123,346,444
1986-7	20,718	91,900,243	2,025	13,227,813	22,743	105,128,056

Source: Inputs and Agricultural Chemicals Divisions, PBDAC.

2.157. The tabulation below provides figures on procured and distributed quantities and values for the Inputs Division for each of the years 1982-3 through 1987-8. The quantity distributed in 1987-8 was almost 20 percent greater than in 1982-3, and the three-year average quantity distributed in the three years 1985-6 - 1987-8 was 42 percent greater than in 1982-3.

Quantities and Value (Product Cost) Of Pesticides
Procured and Distributed by the PBDAC Inputs Division
1982-3 - 1987-8

	Procured		Distributed	
Year	Quantity (MT)	Value (LE)	Quantity (MT)	Value (LE)
1987-8	24,255	116,955,932	17,152	105,766,161

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1986-7	22,845	97,668,848	20,718	91,900,243
1985-6	25,304	86,840,733	23,461	83,263,058
1984-5	17,684	63,790,851	16,378	68,317,856
1983-4	17,926	50,802,138	16,316	67,828,657
1982-3	10,243	37,587,817	14,368	70,985,124

Source: Pesticides Department, Inputs Division, PBDAC

2.158. The use of tonnages is of course a very gross measure of pesticide use. Of the pesticides distributed in 1987-8 by the Commercial Affairs Division, for example, quantities distributed by type of product ranged from two kilograms to 1,010 metric tons. Unit prices likewise varied widely.

2.159. Although the MOA has authorized 247 distinctly registered pesticides to be distributed by PBDAC, the pesticide varieties added to stock by PBDAC and used in a particular year are much fewer than the number whose use is permitted. In 1987-8, for example, the Inputs Division entered into contracts for 52 varieties of agricultural chemicals, and the Commercial Affairs Division distributed 62 varieties. The number of different formulations distributed by private and other public sector firms directly to end users is not known.

2.160. The total use of pesticides can be expressed only in the gross, but not particularly meaningful, terms of tonnages and in value in Egyptian pounds. Even such figures are based in part on uncertain estimates of quantity and value of direct distribution (other than through PBDAC) by private and public sector companies. Private sector sources and the MOA Central Administration for Pest Control agreed in their estimates that the value of imports not distributed by PBDAC totaled approximately LE 19 million in 1987-8. Total pesticide and pesticide ingredient imports in 1987-8 are estimated at about 22,000 tons with a total value of about LE 110 million ($ 102 U.S. million), assuming the same value to volume relationship for MOA and other pesticides. The MOA calculates that final, distributed cost is about 60% above the figures just cited.

2.161. The non-PBDAC distributed pesticides in 1987-8 amounted to only about 8 percent of the total value of the pesticide trade. Of the 87 percent by value accounted for by distribution on behalf of MOA, estimates indicate that some 80 percent by value was applied to cotton, with the remainder applied to rice, wheat, soybeans, and fruits and vegetables. The MOA Pest Control Administration reports that all of the pesticides imported with the special exchange rate fund are used only on cotton, rice, wheat, and soybeans.

The Procurement and Distribution of Pesticides

2.162. All active ingredients of pesticides used in Egypt are imported. Beginning in 1984 private firms and individuals were

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permitted to import active ingredients and formulations thereof except for those used on cotton, sugar cane, and, in part, on rice. Despite the liberalization with respect to imports, however, all active ingredients and formulations thereof are required to be registered with MOA. The registration implies acceptance for use in Egypt, and is based upon a careful evaluation of safety, efficacy, and environmental effects in relation to international standards and the special requirements of the Egyptian ecology. These evaluations include thorough chemical analysis and two seasons of field testing.

2.163. In addition, to its surveillance for product safety and efficacy, MOA must give permission for the importation of quantities and prices paid for each shipment of active ingredients. This permission is based upon a review of applications for importation by the Pesticides Needs Committee. This committee is chaired by the Managing Director of MOA's Central Administration for Pest Control. Other committee members include representatives of the Agricultural Research Council, the Ministry of Transport, the Ministry of Finance, the Council of State, and other entities as appropriate. Criteria employed by the Committee in authorizing imports include:

- Consumption figures of the past five years;
- Projected levels of crop infestation and disease;
- Planned rotations and crop rotation cycles; and
- Foreign exchange constraints.

2.164. In fiscal year 1987-8, MOA received an allocation of LE 55 million at the preferred rate of LE 0.707 to the dollar. For 1989, the corresponding allocation is LE 50 million. In both cases the fund was/will be insufficient for total purchases for MOA of pesticides and active ingredients. Thus, the balance of MOA's purchases are made at the bank rate (LE 2.3 to the dollar was the average FY 87/88 rate). Reportedly, MOA had to use LE 25 million in 1987-8 for additional pesticide purchases at the bank rate.

2.165. Private sector and MOA Pest Control Administration sources estimate that 40 to 45% of the total pesticides used are locally formulated. Data drawn from a list of contracts for procurement of pesticides and pesticide ingredients of PBDAC's Inputs Division for 1987-8, however, suggest that local formulation and packaging were performed for only about 15.5 percent of that year's contracted MOA purchases.

2.166. Importation of MOA pesticides and active ingredients, through international tenders, must, by law, be by public sector trading companies serving as agents for foreign suppliers. Five public sector companies handle the importation and customs

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clearance of pesticides and active ingredients. These are: Plough and Engineering Company, General Company for Trading and Chemicals, El Nasr Import and Export Company, The Arab Company for Foreign Trade, and Misr Foreign Trade Company.

2.167. There are five public sector and one private sector Egyptian chemical companies which repack and/or formulate active ingredients for pesticides. PBDAC finances the importation of the active ingredients. The Economic Government Chemical Co. (MOI affiliated) located in Kafr El Ziat has a licence to import pesticides and active ingredients and enjoys an exclusive reduction of 50 percent of the customs duty. Two military factories, Misr Petroleum, and a co-operative society factory make up the remaining public sector pesticide formulators. The Franchem Co. is the only private sector business engaged in pesticide formulation. Franchem formulates pesticides for a number of different foreign suppliers.

2.168. MOA, having decided on quantities and types of pesticides to be imported, invites and evaluates tenders. The suppliers so selected often engage private sector representation as well. The MOA pesticides imported at the preferential exchange rate are imported through issuance of international tenders.

2.169. Pesticides or their active ingredients imported on behalf of MOA are received at the port of entry by a public sector company which operates a bonded warehouse. This company in turn contracts with a private company or a co-operative for unloading and depositing materials in the warehouse.

2.170. Pesticides not destined for MOA use are imported as finished products and/or as active ingredients by some 25 companies, both public and private. In 1988, four companies, two public and two private, accounted for more than one half of these shipments. The largest single importer was the public sector pesticide formulator located in Kafr El Ziat.

PBDAC's Role in Pesticide Supply

2.171. In general terms, PBDAC's role in relation to pesticides includes the following functions:

1. Financing the purchase of MOA's pesticides, with subsequent recovery from MOA and the Agricultural Stabilization Fund;

2. Taking responsibility for the distribution through the PBDAC network of MOA pesticides;

3. Providing local currency financing for up to 65 percent of the value of private and public sector purchases of pesticides; and

4. Distributing pesticides on a consignment basis through its Commercial Affairs Division for private and public (non-MOA) sector firms.

Because PBDAC's role differs as between its two concerned divisions, Inputs and Commercial Affairs, the activities of the two divisions are discussed separately in the following paragraphs.

2.172. Inputs Division. The distribution of MOA pesticides among governorates by value in the years 1982-3 through 1986-7 is presented through the accompanying Table II-3. These pesticides are taken from the bonded warehouse at the expense of and under arrangements made by PBDAC, whether to formulators/packagers or to PBDAC's distribution system. Similar practices prevail for the movement of packaged goods from the local firm to distribution facilities.

2.173. From the 1980-1 fiscal year onwards, a percentage has been added to the value of the imports of MOA pesticides. This is to cover the costs of shipping, insurance, unloading, and port charges. The percentage figures then fixed still prevail. These are 35 percent for cargo arriving CIF, 40 percent for C & F, and 45 percent for FOB. These percentages are estimates of costs before receipt of shipping documents. Should the percentage applied exceed actual costs, the excess amount is transferred to a reserve fund for the purchase of additional MOA pesticides. If costs are above the applied percentage, this additional amount is transferred from the reserved fund to cover the excess.

2.174. Several charges are made in addition to those mentioned in the preceding paragraph. These include a customs charge of 10 percent of the value of the shipment, based upon the FOB cost of the import converted to Egyptian pounds at the rate of LE 1.89 = $1.00. A charge of LE 20.80 per ton is also levied for the movement of shipments from the ports to warehouses in the governorates.

2.175. PBDAC receives a 21 percent commission on the value of products for its services in distributing pesticides. This commission includes 13.5 percent of value for interest on financing costs incurred for the purchase; 1.5 percent of value for PBDAC's storage, administrative, and other expenses in moving products within PBDAC's distribution system; 5 percent for purchases not made through co-operatives, much of which accrues to PBDAC; and 1 percent for the pesticide reserve fund referred to earlier.

2.176. Commercial Affairs Division. This division distributes pesticides for private and public sector firms on a consignment basis. The volume of this business by category of agricultural chemicals is shown in the accompanying Table II-4. As the table

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suggests, this division's pesticides volume in value terms is almost 14.3 percent of the total value handled through PBDAC. Reportedly, these products are primarily for application to horticultural crops, although some private sector importation for weed control on wheat and barley is reported.

2.177. The distribution charges made by the Commercial Affairs Division include the following:

1. A 5 percent commission on dealer's price is charged unless the buyer is a public sector organization or a land reclamation company, in which case the commission is reduced to 1 percent. In 1987-8 the land reclamation companies accounted for 45.7 percent of the total value.

2. A personnel incentive payment of 1 percent of dealer's price, divided between governorate (85 percent) and PBDAC (15 percent) staff.

3. One quarter of 1 percent of dealer price is charged for PBDAC storage costs.

4. One eighth of 1 percent is charged for insurance costs.

No transport charge is made, for products are delivered to PBDAC installations by product owners.

Pesticide Subsidies

2.178. Pesticide subsidies take two forms:

1. In 1986-7 and 1987-8 MOA was allotted LE 55 million for the purchase of MOA pesticides and active ingredients, for conversion to dollars at the rate of LE 0.707 to $1.00. At the FY 87/88 average free market rate of 2.30 to $1.00, this was the equivalent of $77.8 million or LE 178.9. This conversion rate, thus, is the equivalent of a subsidy of L.E. 123.9 million. In fiscal year 1988-9, LE 50 million is expected to be provided at this concessionary rate.

2. During FY 1987-8, farmers were charged LE 18 per feddan for application of cotton pest control substances. The cost of pesticides and their application was estimated by MOA at LE 130 per feddan. In 1987-8 approximately 980,000 feddans were cultivated to cotton, for a total cost of LE 127.4 million. Recovery was LE 17.44 million, with an apparent subsidy of approximately LE 110 million. The records of the Agricultural Stabilization Fund show a pesticide subsidy of L.E. 107 million for 1987-8.

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Financial Results for PBDAC

2.179. PBDAC's income resulting from pesticide distribution has increased steadily over the past three years from LE 16.3 million in 1985-6 to L.E. 21.6 million in 1987-8, while the share of net income in gross income dropped from 0.29 to 0.26. More complete and detailed financial information is provided in a later chapter of this report.

Summary of Findings

2.180. The findings may be summarized as follows:

1. The requirements of Egypt for agricultural chemicals may be well in excess of quantities available for application.

2. Even so, the costs of those provided are very great, and attended by very heavy subsidies.

3. All active ingredients of agricultural chemicals are imported, with local formulation and packaging carried out by five public sector firms and one of the private sector.

4. Approximately 70 percent of all pesticides available for application are those intended for cotton production; these quantities used and their application account for a very large part of the total subsidy.

5. Importation is through public sector companies as agents, supplemented by some private sector participation in the process of importation.

6. Agricultural chemicals are controlled as to safety, efficacy, and environmental effects by MOA.

7. MOA controls extend also to the licensing of pesticide importers/dealers, and to detailed planning of types and quantities to be imported and distributed through the Inputs Division of PBDAC.

8. PBDAC, through its Commercial Affairs Division, acts as consignee for private and public sector firms engaged in importing and distributing agricultural chemicals. Pesticides distributed through this Division are destined largely for application to horticultural crops.

9. The extent to which private firms supplement their distribution services with related technical assistance to producers is not known.

10. Governmental activity in the distribution of pesticides is concentrated chiefly on field crops while the private sector concentrates on horticultural crops.

11. The use of PBDAC's distribution services are somewhat limited by the practice of aerial spraying of cotton pesticides on production area blocks.

12. MOA has facilities of its own in the governorates for the storage of pesticides.

Privatization of Pesticides

2.181. The GOE, under any adjustment of public to private sector distribution of pesticides, would be expected to continue its role of screening, registering and/or licensing pesticide formulation for specific pest control uses. Surveillance and licensing/registration should, however, be conducted to insure product safety and efficacy while allowing for and even encouraging competition among suppliers/distributors.

2.182. Another section of this report provides a financial and economic analysis of pesticides applied to subsidized and non-subsidized cotton. The analysis shows, in part, that removal of the cotton pest control chemical subsidy would reduce the gross margin per feddan on cotton production by approximately 16 percent.

2.183. Additionally, general effects of divestiture from PBDAC and greater privatization of the pesticide distribution activities may be expected to include the following:

1. Farmers, over the short term at least, may have to travel somewhat farther to acquire their pesticides.

2. Over the medium term, a wider selection of pesticides in more direct response to needs perceived by farmers should become available.

3. Also, over the medium term, pesticide distributors will develop as suppliers of valuable technical assistance to farmers.

4. Private firms, newly engaging or expanding in pesticide distribution, will likely encounter greater operational economies with regard to their already existing input supply activities such as vegetable seed and agricultural equipment sales and therefore be able to pass these efficiencies on to farmers in a competitive business environment.

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Privatization Options

2.184. The privatization options outlined below are recommended with respect to pesticides.

2.189. Option I. For this option it is assumed that the Government of Egypt intends to continue to maintain complete control of inputs for and outputs of cotton. Therefore, in this option at least in the near future, MOA will continue with its functions of deciding on the varieties and quantities of pesticides to be imported for application to cotton. The public sector trading companies will continue to be the importers. PBDAC will remain responsible for the transportation, storage, and distribution of these pesticides. And, finally, MOA will continue to contract with public and private firms for the aerial and ground application of pesticides on cotton fields.

Under this option it is recommended that:

1. PBDAC discontinue distribution of private sector pesticides as of the summer of the 1990 crop year. At present the value of the pesticides imported by the private sector is estimated at LE 25-30 million. About one third of this is distributed and sold by PBDAC, while the other two thirds are distributed and sold by the private sector. The implication of the implementation of this recommendation is that the volume of trade in pesticides by PBDAC will decline by about LE 8-10 million.

2. MOA discontinue the importation of pesticides except for cotton as of the summer of 1991. All non-cotton pesticides would then be imported by public and private firms. The public and private firms would be treated on the same footing with respect to rate of foreign exchange, customs duties, service charges, and the like.

   At present, 80 percent of the LE 55 million in pesticides imported for MOA at the preferred rate of foreign exchange (LE 0.707) is applied to cotton. An additional L.E. 25 million in pesticides is imported for MOA at the prevailing bank rate of exchange. The implication of the implementation of this recommendation is that about LE 40 million of non-cotton pesticides would be imported, distributed, and sold by public and private sector firms.

3. PBDAC continue taking delivery, storing, and distributing MOA cotton pesticides in the near future, i.e. during the next three years.

4. PBDAC continue to keep the accounts for MOA for imports, transportation, storage, and distribution as well as collect the fees from farmers for the application of

pesticides to their cotton crops.

5. As of year four, the MOA arrange for the transportation and storage of cotton pesticides through its own facilities.

2.190. Option II. This would be the same as Option I except that the private sector firms would be given the opportunity to participate in competition with public sector firms in the importation and distribution of pesticides for cotton to MOA agents in the governorates.

2.191. Option III. This would be the same as Option I except that the discontinuance of PBDAC distribution and sale of private sector pesticides and MOA non-cotton pesticides would be implemented in selected governorates. If and when the cotton crop is decontrolled and vigorous farmer production cooperatives are in place, it would be reasonable to expect that the efficient application of pesticides on cotton would be arranged in at least certain areas of the country by such farmer cooperatives.

The Agricultural Machinery Subsector

2.192. This report section presents findings and privatization recommendations regarding PBDAC's role and relationships in providing machinery and equipment for agricultural production. It first describes PBDAC's role and that of the private sector. It then summarizes principal findings of this review and finally presents options recommended for consideration in privatizing PBDAC's activities in this subsector of input supply.

The Role and Relationships of PBDAC

2.193. PBDAC sells and finances the sale of a wide variety of agricultural machinery and equipment for production cooperatives and farmers. Some of these items are purchased by PBDAC, but the majority are sold on consignment. The machinery and equipment lines handled by PBDAC include tractors, mowers, threshers, irrigation pumps, irrigation sets, cultivators, harvesters, forage choppers, milking machines, milk separators, rabbit and poultry cages, as well as generators, vehicles, trailers, bicycles, motorcycles, and sewing machines. These items are either bought from government manufacturers, imported directly by PBDAC, or sold on consignment for private importers and suppliers.

2.194. It has not been possible to arrive at a sufficiently precise figure of PBDAC's profit in this activity. This is because this activity falls under the jurisdiction of three separate departments in two divisions. While in the case of spare parts (sale of sprayers) the exact figures of profit is reported and it has been about LE 1.3 million in each of the last three years, in the case of agricultural machinery and equipment that fall under the Commercial Affairs Division along with sale of vegetable seed, foliar fertilizers, pesticides, etc., desegregated figures were not available. It can only be assumed that of a profit of about LE 6.8 million in each of the last three years, the major part is attributable to the sale of agricultural machinery and equipment.

2.195. Three separate units in PBDAC deal in agricultural machinery and equipment. These are the Agricultural Machinery and Agricultural Equipment Departments of the Bank's Commercial Affairs Division and the Spare Parts Department of the Inputs Division. The largest share of these activities are those of the Commercial Affairs Division, which are described first, followed by a review of those of the Inputs Division.

Activities of the Commercial Affairs Division

2.196. The most important activity of PBDAC in Agricultural Machinery and Equipment falls to the Agricultural Machinery Department of the Commercial Affairs Division, and secondarily to that division's Agricultural Equipment Department. With the exception of sprayers, which are handled by the Spare Parts

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Department of the Inputs Division, all agricultural machinery and equipment as well as some non-agricultural machinery falls under the jurisdiction of this division.

2.197. In 1986-7 and 1987-8 the Agricultural Machinery Department sold a total of LE 178 million and LE 187 million worth of equipment. In 1987-8 about LE 50 million of these sales represented equipment produced by the public sector. These sales included all the tractors produced by the Ministry of Military Production and the Nasr Company as well as some of the tractors produced by the Plough and Engineering Company, and ploughs, cultivators, threshers, and irrigation pumps produced by the Beheira Company. Some 90 percent of domestic tractor production is accounted for by government factories. The remaining LE 137 million were sold on consignment, including Romanian tractors imported by Diabco Company, Japanese tractors imported by Daldes Company and MEDCO, threshers produced by Tanta Motors, and pump irrigation sets and threshers produced by Karnak Company and Nashat Kasrawy.

2.198. The following tabulation shows the sale distribution of machinery of the Agricultural Machinery Department by kind and value in 1986-7 and 1987-8. (For detailed information, see Tables II-5 and II-6).

	1986-7		1987-8	
Type of Machine	No. of Units	Value (LE Million)	No. of Units	Value (LE Million)
Tractors	5,160	56.9	4585	57.6
Mowers and Threshers	2,386	17.5	3,507	19.8
Vehicles	1,469	22.5	1,211	38.4
Generators	1,267	6.6	4,915	4.7
Motor and Bicycles	34,868	25.5	15,298	5.5
Sprinkler motors	6,579	2.0	19,163	3.9
Irrigation pumps and sets	16,096	30.2	23,759	55.3
Cultivators and Harvesters	1,273	5.8	977	4.5
Trailers	690	4.1	696	3.0

Other	1,744	7.1	8,381	8.9
TOTAL a/	71,532	178.4	82,492	202.8

a/ These figures are different from those reported by PBDAC, which were characterized by numerous arithmetic errors.

2.199. The most significant change that has taken place in the last two years is that motorcycle and bicycle sales constituting 14.3% of the sales in 1986-7 dropped to 2.7% in 1987-8. Otherwise, there was no dramatic change in the shares of the other machinery types in total sales. The most important items of sales in both years were tractors, irrigation sets, and vehicles. In 1987-8 these accounted for 28, 27, and 19% respectively.

2.200. Countrywide, 11 governorates accounted for more than 80% of the total agricultural machinery sales of PBDAC. These were: Gharbia,Dakahlia, Sharkia, Menufia, Kalubia, Giza, Menia, Sohag, Qena, Beheira, and Beni Suef, each with sales of more than LE 10 million. The volume of sales in these governorates, however, showed considerable variations between these two years. In 1987-8 the three governorates of Dakahlia, Menia, and Qena absorbed LE 61 million of the LE 203 million total sales, or 30 percent, while in the preceding year the sales in the same three governorates were LE 37.5 million or 21 percent of the total sales.

2.201. PBDAC does not have what might be described as showrooms for equipment display, but it does provide space for some agricultural machinery in some of its shonas; this space is generally in poor condition for equipment display purposes.

2.202. PBDAC finances the purchase of machinery up to 75 percent of its value for a period of three years at 14 percent interest against collateral. PBDAC does not provide after-sales service for machinery purchased through the organization.

2.203. Based upon the information made available for the project, it is not easy to estimate the importance of the role of PBDAC in the distribution and sale of agricultural machinery. Information about the total stock of agricultural machinery in Egypt is not available. The most recent information of this sort that could be obtained was for 1981-2. The stocks in that year were reportedly of the order shown in the table II-7.

2.204. Comparing figures shown in Table II-7 with the sales of agricultural machinery by PBDAC in 1986-7 and 1987-8 the inevitable conclusion is that the role of PBDAC in the sale of agricultural machinery is an important one. In 1981-2 the total stock of tractors (50-65 horsepower) was reported at 38,637, trailers at 17,819, threshing machines at 7,712 and pesticide spraying machines at 12,610. PBDAC reports that in the two years 1986-7 and 1987-8 it sold 9,745 tractors, 1,386 trailers, and 5,893 mowers and threshers. These sales figures are very significant additions to

the total stock of these machines. In the absence of accurate statistics on the total sales of agricultural machines and numbers handled by PBDAC it is not possible to make a reasonably accurate estimate of the role of PBDAC in this activity. A further complicating factor is the element of double counting, because sales by PBDAC are reported as sales by manufacturers and importers as well.

2.205. The available informations, however, leads to the conclusion that, besides satisfying the demand of the public sector for sprayers, PBDAC is the most important source of institutional credit for financing machinery purchases by farmers. In this respect, PBDAC provides medium-term loans for machinery purchased by farmers. In this case PBDAC acts only as the financing agent. PBDAC also imports machinery through dealers for sale to farmers and purchases machinery for resale to them. Finally, PBDAC accepts dealers machines on consignment. It is estimated that the recent years more than 50 percent of all agricultural machinery sales were financed by PBDAC.

2.206. The most common procedure for sale of agricultural machinery is that the farmer brings a dealer's proforma invoice to the village bank, which issues a check to the dealer. This arrangement is made in either of two ways. The dealer may approach a PBDAC bank, which agrees to serve as a sub-dealer. Or, each year the BDACs specify a mix of machinery that is believed possible of sale, on the basis of a public announcement. A majority of the buyers of agricultural machinery sold through PBDAC are individual farmers.

2.207. In addition to its responsibilities in the distribution of agricultural machinery, the Commercial Affairs Division, through its Agricultural Equipment Department, is responsible for the sale of small equipment on a consignment basis. The equipment lines available include rabbit and poultry cages, milking machines, milk separators, corn shellers, and forage choppers. The department was unable to provide meaningful data on either the numbers or value of these items for recent years, and its data on distribution by governorate were not understandable. (Refer to Table II-8).

Activities of the Inputs Division

2.208. The Spare Parts Department (SPD) of the Agricultural Inputs Division deals exclusively with the importation, local purchase, and sale of agricultural sprayers. This department either imports sprayers with funds provided by MOA or imports sprayers with PBDAC funds. In 1987-8 SPD purchased about LE 4 million, of which 1.4 million was locally manufactured. Of the total of LE 4 million, 1.7 million was on the account of MOA and the remainder on PBDAC's account.

2.209. The total purchases (see Table II-9) amounted to 3,065

units of sprayers, 2,000 of which were backpack sprayers, 550 sprinkling sets with 600 liter capacity, and 265 sprinkling sets for mounting on tractors. For the service provided to MOA, PBDAC receives a total commission of 16 percent, of which 10 percent is for receiving, storing, and distributing the goods. When purchases are made on its own account, PBDAC instead of 16 percent receives a total commission of 30 percent. The difference represents the cost of financing the purchase of the items sold.

2.210. Of the 2.3 million imported or purchased locally by PBDAC on its own account, PBDAC reported that only 20 percent were sold directly to individual farmers. The remaining 80 percent was sold either to the public sector agricultural companies or to agricultural cooperatives or agrarian reform cooperatives. The share of the public sector agricultural companies was reported as 20 percent and of cooperatives, 60 percent. The majority of the agricultural companies are engaged in land reclamation. These are Shemal El Tahrir, Noubaria, and Marriut. But Salam Poultry Company and the General Company for Animal Production were also recipients of these sprayers.

2.211. In contrast with 1987-8, in 1986-7 total purchases of PBDAC were 3,800 units for a total cost of L.E. 1.9. Of these, 1,500 were backpack sprayers, 600 were sprinkling sets of 600 liter capacity, and 1,000 were hand sprayers.

2.212. What emerges from the above information is that PBDAC is a major importer and purchaser of domestically produced sprayers. The primary role of PBDAC is to provide the public sector with sprayers: of the total purchases of LE 4 million in 1987-8, less LE 0.5 million was in sales to individual farmers.

Private Sector Activities

2.213. The private sector is very active in the importation, assembly, production, distribution, and sale of agricultural machinery to the public sector and to individual farmers. These firms provide a range of equipment that is essentially the same as that produced by the public sector companies, both in the types of equipment and basic designs. Many major overseas manufacturers maintain offices in Cairo with sales representatives. The representatives maintain liaison with the local dealers, explore opportunities for additional sales, and monitor technical problems associated with manufacturers' products.

2.214. Machinery dealers are found all over the country. They fall into three basic categories:

1. Dealers specializing in the importation of agricultural machines;

2. Manufacturers of agricultural machinery and equipment

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who also serve as importers; and

3. Importers and other enterprises for which agricultural equipment is only one of a number of activities.

2.215. There are between five and ten large private firms that are importers. One importer reported the sale of 25,000 pumps out of a total of 40,000 sold in the country in 1988. The same firm claimed the sale of 15,000 generators out of total sale of 17,000, and 900 garden tractors of a total of 1,000. The same firm reported the expected sale in 1989 of 300 threshers produced by the Ministry of Military Production. Another large firm has been engaged in the importation, distribution, and sale of tractors, cultivators, mowers, and pumps. It reported the sale of more than 4,000 tractors, 1,000 mowers, and 1,500 pumps.

This firm deals in more than 100 different types of agricultural equipment.

Summary of Findings

2.216. Findings of this review may be summarized as follows:

1. PBDAC has an important place in distributing agricultural machinery and equipment, but its relative significance cannot be stated in the absence of reliable current figures on the total stock and sales of machinery and equipment and on the division of sales between PBDAC and the private sector.

2. PBDAC provides some limited but often inadequate display space for agricultural machinery items available through private dealers of PBDAC.

3. PBDAC plays a very important role in financing the purchase of agricultural machinery and equipment by farmers, but offers neither after-sales service nor technical guidance with respect to purchases made with its financial or distributing participation.

4. PBDAC's financial return from the distribution of agricultural machinery and equipment is relatively modest in relation to the gross monetary value of the purchase in which it is involved.

5. The private sector is very active in the importation, manufacture, assembly, distribution, and after-sale service of agricultural machinery and equipment.

6. There is in place in Egypt an extensive network of representatives of foreign manufacturers.

7. Dealers and sub-dealers in agricultural machinery and equipment are present in all the governorates and regions of the nation.

8. Commercial banks are active in the financing of agricultural machinery purchases by larger farmers.

9. PBDAC is a major importer and supplier of sprayers to the public sector.

10. PBDAC's role within the subsector is important but not essential to the supply and service of agricultural machinery and equipment.

Privatization Options

2.217. Options recommended for the subsector are as follows:

2.218. Option I. PBDAC should announce immediately that while it will continue the financing of the purchase of agricultural machinery and equipment it intends to discontinue the sale of these items within four years.

(a) PBDAC would announce that from the beginning of 1991 it will discontinue the importation, purchase of domestically produced, distribution, and sale of all agricultural machinery except for tractors and irrigation sets.

These two items accounted in 1987-8 for 56 percent of the total sales of PBDAC. This means that PBDAC would no longer be involved in the sale of mowers, threshers, vehicles, generators, motorcycles, bicycles, sprinkler motor, cultivators, harvesters and trailers.

(b) The domestic producers and the importers of tractors and irrigation sets as well as other agricultural machinery and equipment would be advised to grant franchises to and license the private dealers for the sale of these items.

(c) Over a three year period PBDAC would reduce and phase out its sale of tractors and irrigation sets.

2.219. Option II. PBDAC should discontinue its agricultural machinery sales in selected governorates as of the beginning of 1991. It is recommended that the governorates selected initially be high-volume, low-transportation-cost governorates where the private sector is most active at the present time. The governorates of Dakahlia, Menia, and Qena would seem to be good candidates. Depending on the experience in one or all of these

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governorates, the divestiture of PBDAC involvement in other governorates would be implemented.

2.220. Option III. PBDAC would divest itself of the sale of vehicles, motorcycles, bicycles and trailers immediately and reduce its sale of all other agricultural machinery and equipment by 30% of its sales of 1987-8 by 1991-2. Based on the experience in this privatization, in the subsequent years PBDAC would discontinue handling sales of the agricultural machinery.

The Animal Feed Subsector

2.221. This section describes the input supply subsector of feed for Egypt's stock of domestic animals for the production of foodstuffs and by products, transport, and farm operations. In doing so the section, within the limits of available information:

- Characterizes the nation's animal population;
- Characterizes animal feed needs;
- Describes the sources of supply;
- Describes arrangements for meeting needs;
- Describes the role and relationships of PBDAC, other public entities, and the private sector in meeting needs; and,
- Examines opportunities and approaches for the privatization of PBDAC's activities as a supplier of animal feed.

The National Animal Population

2.222. The domestic animal population of Egypt is large and diverse. It comprises animals held for meat, milk, other food products (especially eggs), and by-products, animals used for human transport and drayage, and for farm operations. Available information about the present proportions of this population are at best approximations. The accompanying Tables II-10 and II-11 suggest its proportions and its distribution among the various types of animals. Table II-10 compares data drawn from the Statistical Yearbook: Arab Republic of Egypt, June, 1988, with estimates of the Ministry of Agriculture (MOA) of the 1988 animal population. Both sets of figures are limited to larger animals. Table II-11 in a degree amplifies the information included in Table II-10 by providing data on the numbers of animals slaughtered in the period 1982-87, inclusive. The Statistical Yearbook reported a total of 40,158,000 smaller animals, including local chickens (some 73% of the 1986 total), other fowl, and rabbits.

2.223. Ownership of the nation's large animal stock is based upon estimates. These suggest 80-90% of the total are owned by small farmers (holdings of five feddans or less). The remainder are held by larger farmers or commercial operators of feed lots and milking or fattening operations; some of the latter are reported to be quite large, with populations of up to 20,000 head of cattle. Commercial poultry operations, now greatly reduced as compared with a few years ago, are characterized by relatively large-scale production.

Animal Feed: Supply and Production

2.224. Feed and fodder supplies for Egypt's domestic animal population are quite large. The total annual consumption of feed and fodder is literally in the millions of tons. Much the greater part of this total is fodder or forage, food which animals obtain for themselves by controlled grazing of Egyptian clover or which is supplied in green or dried form by their owners. Clearly the principal source of fodder is Egyptian clover, which occupies from one third to one half of the cultivated land area during the winter season. Maize leaves and other crop residues make up the balance of the livestock fodder. The feed requirements of most work animals and many held for meat and milk production are met outside commercial channels. The MOA reports that some 15 million tons of roughages are available for collection annually from farms. The Ministries of Industry and Agriculture agree that livestock feed "requirements", presumably for processed concentrated feed mix rather than fodder, total some 5-6 million tons annually.

2.225. For livestock that are produced and fed for commercial purposes, fodder is supplemented with concentrated feed mixes. Such mixes reach fewer than 1.4 million head of cows and buffalo of a total stock of such animals estimated to number from 4.4 to 4.7 million head. Concentrated feed mix is being produced for three general purposes: livestock fattening, milk production, and feeding or "starting" young calves. Only very small quantities of the starter feed are currently being produced, probably fewer than 40,000 tons per year. The balance of the feed, both milk production and fattening rations, has become categorized as either traditional or non-traditional feed, with the differences indicated below.

1. Traditional feed, used for both fattening and milk production, is prepared to formulas set by MOA, from ingredients supplied to mills by MOA with PBDAC assistance, and distributed at prices fixed by MOA. This concentrated mix is characterized by such high value ingredients as cottonseed meal (currently 15 to 25 percent), wheat and rice mill by-products, and maize (both yellow and white) in varying proportions. Proportions of ingredients vary with costs and the practices of individual plants. The mix is produced by soap and oil companies of the Food Industries Corporation (FIC).

2. Non-traditional feed, likewise used in livestock fattening and milk production, is made from formulas approved by MOA, with ingredients obtained on the open market, and sold at market rather than prices fixed by MOA. This mix has been introduced in the recent past

owing to limited supplies of cottonseed cake, which is used almost entirely for traditional feed, and in response to declining imports of yellow maize. Maize shortages are attributed to foreign exchange constraints. This feed typically contains feed urea combined with roughages in partial substitution for the protein and energy content provided by cottonseed cake and maize in the traditional mix. MOI mills which produce non-traditional feed, however, make some use of cottonseed meal in their mix.

2.226. Estimates of the supply of animal feed produced in Egypt, excluding poultry and small animal feed, vary by wide margins. According to MOA and PBDAC, total 1988 production was 3 million tons. According to the Food Industries Corporation (FIC) of the Ministry of Industry (MOI) total production was 2 million tons, of which 1.6 million were produced by FIC and 400,000 by Ministry of Supply (MOS) plants. Between 1980 and 1987 large animal feed production increased about two percent per year. Since 1984, however, the production level has remained relatively stable. This production level has left a very large amount of unused capacity within the industry of about 57 percent. Table II-12 provides information on the production of concentrated mixes by public sector mills in the period 1980-7.

2.227. There is, moreover, disagreement about the role of the private sector in the production of feed. MOA/ FIC and some informants in PBDAC insist that the private sector has no part in the production of finished feed and that the private sector is limited to preparing some ingredients delivered to government mills. By contrast, other PBDAC informants have provided to the consultants a list of private sector plants, each of which may account for an annual production of 30,000 tons or more.

2.228. Contradictory information was reported to the consultant about distribution as well. According to MOA and PBDAC, about half of the 3 million tons reportedly produced is distributed by PBDAC and about half is sold directly to end users. FIC, however, reported that its entire production of 1.6 million tons was turned over to PBDAC for distribution. The 400,000 ton production of MOS's and governorate mills reportedly was sold directly to end users.

2.229. FIC's figures are taken as controlling for purposes of further discussion, for three reasons: (a) disagreement exists as to the quantities of feed produced; (b) the 1,000,000-ton difference in total production between the MOA-PBDAC production figure (3 million tons) and FIC's figure (2 million tons) is not explained in data about distribution totals; and (c) FIC is the largest producer of animal feed.

2.230. Accordingly, in 1988 total production of prepared feed is

taken to have been 2 million tons, of which 1.6 million were produced by FIC's 22 mills operated by its soap and edible oil companies. An additional 400,000 tons were produced by MOS mills and mills owned by governorates. All of the 400,000 tons produced by MOS and governorate mills were non-traditional feed.

2.231. Key ingredients for FIC's feed mills are delivered to the mills by PBDAC except for some pellets produced by three private mills. PBDAC takes delivery of all the finished goods of FIC mills for distribution to end users. It is reported that new non-traditional feed mills are being erected which, on completion, will increase the production capacity of MOI mills to one million tons of non-traditional feed; this quantity will increase its total capacity to 2.5 million tons of both types of feed. Interviews in FIC indicated plans for a capacity of 3.5 million tons.

2.232. The 1988 FIC price to PBDAC was LE 150 per ton, PBDAC's price to end users was LE 200 per ton, and the commission to PBDAC was LE 5 per ton. PBDAC's annual feed operations contributed approximately LE 3 million in profit in 1984-85, and LE 7 million in 1987-8, for an increase of more than 130 percent in the period. No subsidy is reported at the MOI manufacturing or the PBDAC distribution level. Feed is subsidized, however, to the extent that the ingredients supplied to MOI mills are at less than the market price. The accompanying Table II-13 shows estimated unsubsidized prices of ingredients of concentrated feed mixes.

2.233. The Government of Egypt has assisted the animal industry through the sale of heavily subsidized ingredients such as imported yellow maize, wheat bran, cottonseed cake, and molasses. These subsidies were passed to consumers through lower prices in animal feed and such final consumer products as eggs, poultry meat, and meat and milk.

2.234. The public costs of these subsidies have been substantial. In 1987 a total of about 1.5 million tons of large animal feed were produced and sold at a subsidized price of LE 170 per ton. The unsubsidized price was estimated at LE 274 per ton. Thus the subsidy for large animal feed, based on the difference in ingredient prices alone, amounted to LE 164.5 million. These subsidies, however, are gradually being removed, with corn reaching world market prices in the summer of 1988.

Distribution of Animal Feed

2.235. The current basic policy of MOA is the distribution of traditional feed through PBDAC on the basis of allotments to categories of end users, a policy that has prevailed at least in the recent past. Non-traditional feed, although apportioned among the governorates for distribution through PBDAC, is sold to end users without control as to the quantity taken except as limited by the available supply.

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2.236. The responsibilities of PBDAC in relation to animal feed are basically the following:

- To help MOA in planning for the supply and distribution of allotments of animal feed;
- To act as the Ministry's agent in the procurement and distribution of yellow and white maize to feed mills;
- To receive and distribute processed animal feed through its supply network; and
- To execute the plans of MOA for the distribution of traditional feed to the recipients of allotments, within available supplies, and to receive and distribute non-traditional feed to others within the limits of available quantities.

2.237. The system of allotments of traditional feed derives from the shortage of certain principal ingredients, particularly cottonseed meal and yellow maize, for the latter of which local white maize is now being substituted in part. The maize shortage in turn comes from the many claims upon and consequent shortage of foreign currency available for the satisfaction of all such claims. Accordingly, the Ministry of Agriculture, through PBDAC, has adopted and applied a rationing system for feed distribution. For traditional feed, this rationing system envisions stipulated quantities for selected meat and milk producers plus allotments to the governorates for other designated claimants. Allotments of non-traditional feed among the governorates are presumably based upon estimates of comparative need.

2.238. This system, in use in 1987-8, is being applied again in the current year. The 1989 allotments draw upon a smaller total available supply of traditional feed than in the preceding year because of ingredient and foreign exchange constraints.

2.239. The preparation of the feed requirements plan involves MOA, PBDAC governorate and village banks, and shonas. The plan in the first instance derives from records maintained by MOA of the numbers of large animals in each village, with monthly reporting of changes in numbers to MOA in Cairo. Based upon these reports and feed requirements per animal. governorate requirements are estimated and consolidated for all governorates in Cairo, where adjustments are made to meet the available supply.

2.240. Based upon these estimates, PBDAC and MOA prepare a monthly schedule of feed distribution for each governorate, and PBDAC sends copies to feed mills as a basis for their production schedules.

In governorates with feed mills, the governorate bank (BDAC) prepares a detailed transportation plan for its mills in supplying the governorate itself and other governorates. Throughout the course of the execution of the distribution plans, PBDAC is kept informed and maintains detailed surveillance of progress in and impediments to satisfying scheduled requirements and makes adjustments as necessary.

2.241. In order to illustrate the allotment system, the ensuing paragraphs describe the 1989 allotment plan. The planned distribution of the total supply is presented through the accompanying Table II-14. The 1989 allotment plan is set forth below. The sources of the figures on animals expected to be supplied is the Central Administration for Animal Production of the Ministry of Agriculture.

1. Under Phase I, National Veal Project, the owners of water buffalo no less than three months of age nor more than 10 months are entitled to receive approximately one ton per head per year. This allotment is expected to provide for 180,000 head of cattle in 1989. These owners are also eligible for loans from PBDAC of LE 300 per head.

2. Under Phase II, National Veal Project, animals from Phase I are delivered to parastatals such as the Agricultural Company, the Egyptian Meat Company, and fattening yards belonging to the governorates. This allotment is 1.5 tons of feed per animal per year. Reportedly some 10 percent of the feed allocated for this project is sold to private owners. The allotment is expected to extend to 142,000 head in 1989.

3. Allocations for public authorities and companies comprise the third category of feed allotments. The beneficiaries of this class are governmental organizations which hold local and imported cows and female buffalo primarily for milk production, in contrast with the first two classes of allotments, whose objective is meat production. Under this scheme, the allotment per year is about 1.1 tons of feed. This allotment is for an anticipated 88,000 head in 1989.

4. Milk producers supplying the Misr Dairy Company are the fourth beneficiary group, with producers entitled to receive feed from PBDAC on condition of delivery of 2.5 kg of milk per day to Misr Dairy. This allotment is intended to provide for 55,000 head in 1989.

5. A further allotment is made for guarantine stations (cattle held pending import or export) and fish ponds. This is the smallest allotment, amounting to 18,000 tons

in 1989 and an unknown number of animals.

6. Fattening and milk production operations of military stations and prisons comprise the next category of recipients. The allotment is 150 kg per month per head for fattening, and for milk production 80 per month per head during the winter and 100 kg in the summer. An estimated 28,000 head of cattle are provided for under this allotment for 1989.

7. Under allotments for governorate fattening and dairy projects, traditional feed is planned for some 625,000 head of cattle of private individuals and firms which are insured by the government. The established feed quotas are: (a) 120 kg for fattening and 80 kg for dairy cattle per winter month; and (b) 120 kg for fattening and 100 kg for milk production in summer months. These quotas are subject to change by governorate decree.

2.242. Based upon the reported figures for each allotment category, the 1,354,600 tons of traditional feed in 1989 are expected to provide for 1,118,000 head of cattle. The expected supply of 355,500 tons of non-traditional feed will, it is anticipated, provide for some 297,000 head. In total, PBDAC-distributed feed is expected to reach some 1,415,000 head of cattle. This expectation is based upon the plans outlined above and assumes an equal distribution of materials between meat and milk production. The allocations of traditional feed are not sufficient for the animals, with the remaining quantities procured in the free market. The accompanying Tables II-15 and II-16 provide information about the reported 1984-5 - 1987-8 distribution and 1987 production and distribution of large animal feed by governorate and in total.

2.243. In summary, PBDAC's projected 1989 feed distribution is planned to have the following effects:

1. Provide 1,203,600 tons of traditional feed in support of milk and meat production, largely for private producers. The benefited groups include veal producers, Misr Dairy producers, and those involved in governorate fattening and dairy projects. This tonnage represents 88.9% of the total expected supply of traditional feed (1,354,600 tons), and 70.4% of the total amount of animal feed 1,710,100 tons, traditional and non-traditional, to be available during the year for distribution through PBDAC.

2. Provide an additional 151,000 tons of traditional feed, principally for milk and meat production by governmental authorities, companies, quarantine stations, and military and penal installations. This quantity represents 11.1%

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of the total amount of traditional feed, and 8.8% of total feed to be distributed through PBDAC.

3. Provide 355,500 tons of non-traditional feed, largely for private producers of meat and milk. This quantity represents 20.8% of total animal feed to be distributed through PBDAC.

2.244. While effective, the large animal feed production and distribution system supplies feed to only about 25 percent of all cattle and buffalo in Egypt. The reasons for this low number are:

- Most small farmers holding the majority of large animals do not have the economic incentive to buy animal feed, for these animals are raised for other than market purposes;

- The registration requirements of the Cattle Insurance Fund discriminate against the small farmers, since the required number of animals per operation is mostly beyond the number of animals held by the majority of individual small farmers and for most farmers is beyond their economic means;

- Recurrent national shortages of feed ingredients (especially yellow maize) and foreign exchange needed for maize and other imports severely constrain the production of large animal feed and therefore its availability; and

- The private sector can not effectively compete and increase its share of the market as long as state enterprises are subsidized for production and distribution.

The Poultry Feed Industry

2.245. In contrast with the livestock feed that is produced and distributed almost in its entirety by the public sector, the private sector is very active in the production and distribution of poultry feed. The poultry industry has suffered severe problems in the last few years. The level of feed production has declined dramatically as has poultry production. Because of these recent developments it is not possible to give an accurate account of current total poultry feed production and the roles of the public and private sectors. Figures for 1987 production and production capacity are shown in the accompanying Table II-17.

2.246. According to information provided to the consultants, one half of the total poultry feed is produced by the private sector and the other half by one public sector entity, the Al Salam

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Poultry Company. Of the private sector's share of 50 percent, four fifths are produced by four major companies and the remaining fifth by half a dozen small companies which produce feed primarily for their own use. The total production of the four major companies is estimated to amount to 396,000 tons. From a total production capacity of 3.7 million tons per year, slightly over 3 million or 80 percent are in the private sector. In 1987 the private sector produced 1.5 million tons of poultry feed, or 75.6 percent out of a total production of 1.9 million tons.

2.247. On the basis of the foregoing 1988 figures on private and public sector production, the total poultry feed production in 1988 was almost one million tons. It may be noted that one of the major private producers claimed a production level of 360,000 tons as recently as two years ago. Assuming a much lower production than that cited above for the other producers, it would seem that only recently the poultry feed produced may have been in excess of 1.5 million tons.

2.248. Except for wheat bran, all the major ingredients for the production of poultry feed are imported. These ingredients are: yellow maize, meat and bone meal, fish meal, soybean meal, and gluten meal. The major producers of poultry feed are also engaged in the production and sale of chicks, broilers, eggs, and various agricultural products and inputs, such as fruits, vegetable seeds, foliar fertilizers, and farm machinery.

2.249. None of the private or public producers of poultry feed depends on the public sector for the distribution of the feed. They have their own distribution systems, with branch offices, warehouses, and transport facilities. One company reported that it has a distribution network of 20 offices, primarily in the Delta region, and a fleet of some 300 trucks. Another company reported that most of its feed is distributed within a radius of 300 kilometers of its producing facilities but that it reaches customers as far as 600 kilometers from its base. This firm has eight distribution centers, with offices and warehouses.

2.250. What emerges from the above information is that, independently of the public sector, a thriving poultry feed industry developed in Egypt which distributed feed at a level comparable with the livestock feed distribution services of PBDAC. Much of this distribution is directly to end users rather than to distribution points from which end users secure animal feed with their own transport facilities.

Summary of Findings

2.251. Findings are summarized below.

1. Egypt's stock of larger animals is to a very significant extent outside the supply of traditional and non-

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traditional animal feed.

2. Virtually all the livestock feed has been produced by the public sector.

3. The total quantity of feed produced in 1988 was about 2.0 million tons. Of this, 1.6 million tons were produced by mills belonging to MOI and 0.4 million tons by the mills of MOS and the governorates.

4. All livestock feed produced by the MOI mills is distributed by PBDAC.

5. For 1989 MOI projects the production of 1.7 million tons of livestock feed, of which 1.35 millions will be traditional and 0.35 tons non-traditional feed.

6. Of the traditional feed expected, to be distributed by PBDAC in 1989, 57 percent will be for the cattle insurance program. Another 14 percent will be distributed to governmental entities. The remainder (29 percent) is allocated to the veal programs.

7. Of the total feed to be distributed by PBDAC, 38 percent will go to four governorates, each receiving about 130,000 tons or more and 77.5% to 12 governorates, each of which will receive 70,000 tons or more.

8. PBDAC supply meets only a fraction of the concentrated feed mix expectations of commercial producers of animals for milk and meat.

9. The limited supplies of processed feed are associated with the government's allotments of traditional feed to various categories of producers, those involved with meat and milk production. In effect, this is a system of governmental rationing, with MOA determining allotments and PBDAC supplying rationed quantities accordingly as feed is available.

10. There is no allocation or quota for the sale of non-traditional feed.

11. Feed is not subsidized at the production and distribution levels, except that key raw materials are made available to government mills below free market prices.

12. PBDAC makes a profit on its distribution of feed.

13. In 1988 about one million tons of poultry feed were distributed, with half of the total by the private

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sector.

14. Physical distribution of feed is not a major problem as evidenced by the distribution of poultry feed in private and public sector operations.

Privatization of Animal Feed Supplies

2.252. Two recommendations are central to the privatization options set forth below. These are that:

1. The government should not proceed with plans for expanding feed milling capacities.

2. Raw materials for non-traditional feed should be made available to private sector mills on the same terms and conditions as they are available to public sector milling operations.

The reasons for these two basic recommendations should be obvious. Over-capacity already exists in public sector mills, and a further expansion of their capacity will simply provide re-enforcement for the retention of a major role for public sector plants. If the private sector is to enter and enlarge its role in supplying animal feed, it must be placed on an equal competitive footing with the public sector plants in relation to raw material supplies.

2.253. Following action upon the above recommendations, two privatization options should be considered. These are outlined below.

2.254. Option I: This option would proceed through the following steps:

1. Effective immediately, all the non-traditional feed at present distributed by PBDAC should be sold by the MOI directly to traders and end users. Thus 21 percent of total 1989 allotments would be transferred to the private sector.

2. Governmental entities receiving traditional feed should be advised to arrange for their own collection of feed at their earliest convenience, bringing the total transferred to 32 percent of total 1989 allotments.

3. Under a three-year phased program, the allocation of traditional feed for Phases I and II of the National Veal Project, and the insured animals program should be reduced, and, by the end of the period, eliminated. This feed would be sold to traders and feeders by the manufacturers. This step would complete privatization of the input.

2.255. Option II: This option would begin with the first two steps of Option I and would extend them to include the following additional steps:

1. In Year 1 of the three-year period, PBDAC would discontinue the distribution of feed in the four governorates of Beheira, Gharbia, Dakahlia, and Sharkia, thus bringing about 54 percent of distribution to the private sector. Manufacturers would sell directly to traders and end users.

2. In Year 2 of the period, PBDAC would discontinue the distribution of feed in the governorates of Kafr El Sheikh, Menufia, Kalyubia, Fayoum, Minia, Assiut, Suhag, and Giza. Manufacturers would sell to traders and end users. The addition of these supplies would bring the total privatized to 75 percent of the 1989 feed supplied by PBDAC.

3. In Year 3, PBDAC would end its distribution of animal feed in the remainder of the country.

New Jute Bags

2.256. PBDAC has a virtual monopoly of all transactions in jute bags. The only exception is the sale of domestically manufactured jute bags directly to sugar refineries. Prior to the issuance of the Ministry of Agriculture Decree No 105 of 1976 nationalizing the importation, distribution, and sale of jute bags, there were four major and half a dozen small firms besides PBDAC engaged in the importation and distribution of jute bags in Egypt. With one exception these trading firms are no longer on the scene.

2.257. The importation of jute bags is tendered by a government trading company, which analyzes the offers and decides on the purchase. PBDAC takes possession of the imported bags, uses them for the distribution of the inputs or sells them to public or private sector end users.

2.258. All domestically manufactured bags, except for those sold to the sugar refineries, are delivered to PBDAC. The National Company for Jute Production is the only manufacturer in Egypt. It has two factories, one in Shobra El Khema (Kalubia) and the other in Bilbis (Sharkia). All the raw materials for these factories are imported. The table below gives the breakdown of purchase, sale, and profit in this operation by domestic production and imports for fiscal year 1987-8 (in LE million).

	Purchase	Sale	Profit
Domestic	17.5	19.7	2.2
Imports	29.7	45.3	15.6
Total	47.2	65.0	17.8

A separate account is maintained for jute bags and all profits and losses are credited or debited to that account. Losses occur when costs of imported finished goods or raw materials for domestic manufacture increase but the sale price is not adjusted accordingly.

2.259. In 1987-8 of the LE 17.5 million purchased from domestic manufacturers LE 7.3 million was for 2.3 million cotton bags and LE 7.3 million was for 4.8 million 2.5 pound bags for seeds. Of the LE 29.7 million imports LE 10.5 million was for 8.8 million 2.5 pound bags, LE 7 million was for 7.6 million cotton bags, and L.E. 3 million was for 12 million 7 1/2 ounce bags used as sand bags, waterproofing, and army requirements.
PBDAC receives a commission of 16% on the sale proceeds. In 1987-8 this was LE 10.5 million representing 16 percent of the total sales of LE 65 million. Against this income of LE 10.5 million PBDAC reports direct and indirect costs of LE 7 million for this operation. The major items of costs were: personnel costs, LE 3.5

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million, and interest, LE 2.7. In 1987-8 the net income of PBDAC from this operation was LE 3.5 million.

Privatization Options

2.260. Even though the importation of jute bags is not a complicated matter, since the timely availability of this commodity is of strategic importance to agricultural products, in particular cotton, it would be inadvisable to privatize this activity either immediately or very rapidly. Except for one , none of the major trading firms with knowledge, experience, and capital resources are available to resume trade in jute bags. Therefore, it is recommended that the private sectors involvement begin with a modest portion of the imports in the initial year of privatization and increase gradually. Concurrently the government agencies that receive domestically manufactured jute bags through PBDAC should be advised to make their own arrangements for delivery by the manufacturers.

2.261. In the second year of privatization the private sector would be given the opportunity to import a larger portion and also the purchase of a modest portion of the jute bags domestically manufactured. Depending on the degree of success in the transfer of this activity from PBDAC to the private sector, at the end of the second year of privatization a realistic program for the phasing out of PBDAC would be prepared and executed.

2.262. The suggested time table would be as follows :

Year I
(a) GOE announcs that the private sector is allowed to manufacture, import and distribute jute bags.
(b) Private sector is allowed to import 10 per cent of the import requirement.
(c) Government entities are advised to make their own arrangement for delivery of jute bags by domestic manufacturers.

Year II
(a) Private sector is allowed to import 20 percent of the import requirement.
(b) Private sector is allowed to purchase and distribute 10 percent of the domestic production.

Year III
Evaluation of the performance of the private sector.

Preparation of a schedule for transfer of activity to the private sector based on the findings of the evaluation.

2.263. Assuming that the performance of the private sector is satisfactory, it should be possible to disengage PBDAC from this activity in about five years.

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TABLE II-1

Quantities and Values of Field Crop Seeds

Distributed Through PBDAC, 1986-7 and 1987-8

CROP	1987-8 Amount (MT)	1987-8 Price (LE/ 000) a/	1987-8 Price Per MT (LE/ 000)	1986-7 Amount (MT)	1986-7 Price (LE/ 000) a/	1986-7 Price Per MT (LE/ 000)
Cotton	66,625	5,313	80	59,952	4,668	79
Wheat	53,005	16,255	307	51,696	15,102	292
Rice	38,356	13,901	362	40,149	12,848	320
White maize b/	12,457	18,686	1,500	9,192	11,950	1,300
White maize c/	21	11	524	184	92	500
Sugar maize	29	28	966	120	114	950
Local beans	9,469	6,109	645	11,360	6,010	529
Soya beans	4,135	2,212	535	3,877	1,900	490
Lentils	828	899	1,086	1,250	1,485	1,188
Barley	768	272	354	735	248	337
Peanuts	542	446	823	330	265	803
Onion bulbs	510	153	300	294	53	180
Onion black seed	65	644	9,908	42	270	6,429
Sesame	10	17	1,700	14	24	1,714
T O T A L	186,820	64,946		179,195	55,029	

SOURCE : PBDAC

a/ Prices to farmers.
b/ Private sector share of white maize seed production.
c/ Public sector share of white maize seed production.

TABLE II-2

Direct Government Subsidies Applied to Total Cost:

OF PBDAC - Distributed field Crop Seeds

(Winter 1988 and Summer 1987 Seasons)

Crop	Subsidy (LE/MT)	Seed distributed (MT)	Amount of Subsidy (LE)	Crop Season
Wheat	51.560	53.005	2,732.938	WINTER 1988
Onion bulbs	58.460	0.510	29.815	WINTER 1987
Local beans	88.750	9.469	840.374	WINTER 1988
Lentils	21.290	0.828	17.628	WINTER 1988
Subtotal a/	-	-	3,620.755	
Soybeans	26.530	4.135	109.702	WINTER 1988
T O T A L	-	-	3,730.457	

Source : Seeds Department Inputs Division, PBDAC

a/ This subsidy is paid by the General Poultry Company (public sector), while the other subsidies are paid by the General Authority for the Agricultural Stabilization Fund.

TABLE II-3

Distribution of MDA Pesticides During Fiscal Years 1982-3 - 1986-7 by Governorate

Fiscal Year	1982 - 3	1983 - 4	1984 - 5	1985 - 6	1986 - 7
Governorate	Value (L.E.)	Value (L.E.)	Value (L.E.)	Value (L.E.)	Value (L.E.)
Kalubia	1,653,926	1,761,876	1,560,039	1,895,035	1,714,249
Munofia	4,814,248	5,434,563	4,417,102	5,339,945	6,427,775
Gharbia	5,830,295	6,326,892	6,572,093	7,838,517	9,495,916
Kafr El Sheik	4,973,836	4,972,860	4,592,738	5,029,632	6,269,233
Sharkia	6,683,502	7,053,683	6,788,448	8,505,700	9,812,441
Ismailia	380,850	426,249	472,985	637,204	1,068,753
Dakahlia	11,517,334	10,824,825	9,612,681	1,305,2460	13,973,282
Damietta	984,474	1,248,487	1,087,961	1,631,412	2,087,562
Behiera	9,506,215	8,270,893	9,746,025	1,061,4070	10,825,188
Giza	1,344,833	1,906,896	2,087,275	3,254,889	2,173,577
Fayoum	2,366,247	2,148,653	2,594,750	2,912,932	2,541,673
Beni Suef	2,961,121	2,504,915	2,421,425	3,251,717	3,207,587
Menia	5,034,051	3,540,626	3,506,190	4,635,902	4,992,475
Assiut	5,062,229	4,104,212	3,817,771	4,490,653	4,609,333
Suhag	3,182,817	2,475,628	2,203,603	3,398,356	3,554,246
Qena	202,261	197,997	189,400	326,998	447,584
Asswan	25,726	136,915	71,968	71,832	129,010
Cairo	43,030	36,772	50,800	92,976	69,607
Alexandria	92,485	153,123	132,106	349,664	293,751
New Valley	43,818	19,685	61,658	67,710	55,423
Sinai	28,008	58,853	30,035	72,720	169,693
Port Said	4,253,818	4,214,054	6,320,303	5,787,734	7,981,884
Grand Total	70,985,124	67,828,657	68,317,356	83,263,058	91,900,242

Source : Pesticides Department, Inputs Division, PBDAC Governorate and total figures as reported by PBDAC.

Table II-4

Pesticides Distributed Through PBDAC's
Commercial Affairs Division
During Fiscal Year 1986-7 and 1987-8

	F. Y. 1986 - 1987		F. Y. 1987 - 1988	
Type of pesticide Distributed to Individuals	Quantity (MT)	Value (LE)	Quantity (MT)	Value (LE)
Nematicide	1.92	18,207	14.829	144,649
Herbicide	79.22	1,443,891	21.979	288,304
Insecticide	506.26	5,441,654	955.622	6,697,437
Acaricide	4.74	96,919	6.832	138,398
Fungicide	1,032.90	3,985,392	1,311.643	2,255,895
Sub. Total	1,625.04	10,986,063	2,310.905	9,524,683
Active ingredients	400	2,241,750	———	———
Distributed to public sector and land reclamation companies (all types)	——	———	258.290	8,055,100
Totals	2,025.04	13,227,813	2,569.195	17,579,783

Source: Agricultural Chemicals Department,
Commercial Affairs Division, PBDAC

TABLE II-5

PBDAC

Agricultural Machinery Sales, 1986-7

Commercial Affairs Division, PBDAC

Governorate	Tractors		Mowers & Threshing Machines		Vehicles		Generators		Motorcycles & Bicycles		Sprinkle Motors		Irrigation Sets		Cultivators and Harvestors		Trailers		Other Types		Total Value		Adjusted Total	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Alexandria	93	1209700	0	0	4	50800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	1260500	97	1260500
Behaira	224	2338687	34	109730	65	1028330	37	118711	0	0	7	7386	392	804683	1	1225	8	31125	21	16032	789	4455909	789	4455909
Kafr El Sheikh	78	1238942	17	5399	62	1017140	93	136800	261	147046	47	11864	637	1158662	0	0	0	0	4	54985	1199	3770838	1199	3770838
Gharbia	453	3575402	97	393688	201	3144417	0	0	202	784180	423	168941	1002	2108995	217	808508	14	39065	215	192129	4829	11215325	2824	11215325
Dakahlia	398	4731060	375	2135515	99	1627830	258	419628	0	0	484	146983	2225	1336350	109	357204	7	26000	201	1124858	4156	11905428	4156	11905428
Damietta	100	1070432	36	207072	2	30000	83	1435658	912	601679	510	77864	120	231112	4	13650	1	2100	102	980041	1870	4649608	1870	4649608
Sharkia	740	7405546	77	1535975	151	1816145	0	0	2456	1203230	1719	204584	241	239359	1	3757	1	3980	15	447929	5401	12860505	5401	12860505
Ismailia	16	2104708	3	15650	20	322300	2	15436	0	0	77	161910	338	1208747	6	18600	3	10000	40	11997	505	3869348	505	3869348
Kalubia	469	5191652	199	1114260	136	2517885	259	553830	4225	17005455	188	126106	1849	4106133	136	549507	83	79665	4	7652	7548	31252145	7548	31252145
El Arish	19	295930	0	0	22	556453	0	0	14	6915	20	21765	12	55236	0	0	0	0	0	0	87	936299	87	936299
Cairo Branch	1	12520	0	0	0	0	2	31665	0	0	113	225728	0	0	0	0	0	0	20	83682	136	353595	136	353595
Giza	333	3789402	90	500550	138	2504910	43	700816	6544	1385525	2274	321861	1875	3667171	60	198068	27	7624	117	1545648	11501	14060191	11501	14621575
Fayoum	175	2175820	116	624173	48	897670	31	50003	805	507005	5	4845	146	224112	0	0	41	141261	93	122760	1460	4747649	1460	4747649
Beni Suef	309	3586709	260	1454140	82	1443750	166	219018	2925	1122095	212	116705	1390	2376444	23	64420	64	58083	353	359341	5784	10800705	5784	10800705
Menia	454	4695893	191	484315	3	64750	33	134770	950	515398	178	208555	1970	3159851	325	1838385	71	227755	76	84257	4251	11413929	4251	11413929
Asslut	133	1706645	472	7276747	162	3363025	55	119953	103	99364	82	102954	861	2147386	166	559986	129	341574	136	368035	2319	16085669	2319	16085669
Sohag	321	3737745	184	567552	65	1176400	50	2414910	1401	463178	112	30437	1369	3600080	19	88100	67	2590900	101	240300	3689	14909702	3689	14909702
New Valley	0	0	0	0	0	0	0	0	8630	124218	0	0	0	0	0	0	11	38700	0	0	641	162918	8641	162918
Aswan	280	1122446	49	264515	5	114350	56	96545	449	120882	95	3302	108	183170	17	620348	26	734015	93	42530	1178	2083493	1178	2641493
Qena	459	5815998	171	770035	198	730035	48	102950	4977	1445715	17	32562	1276	3028808	97	388200	130	4090095	153	1456410	7526	14179718	7526	14179718
Menufia	105	1168371	15	81285	6	64125	51	91730	14	8400	16	14482	285	613825	72	285397	7	19275	0	0	571	2352890	571	2352890
Gross Cost	5160	56973608	2386	17540701	1469	22470315	1267	6012423	41868	25540291	6579	1988834	16096	30256124	1273	5237355	690	4168133	1744	7138580	65604	177326364	78532	177326364
	5160	56973608	2386	17540701	1469	22470315	1267	6642423	34868	25540285	6579	1988834	16096	30256124	1273	5795355	690	4099517	1744	7138586	65537	177326364	71532	178445748

Source : Commercial Affairs Division, PBDAC.

Table II-6

Agriculture Machinery Sales, 1987-8

Commercial Affairs division, PBDAC

Governorate	Tractors		Mowers and Treshing machines		Vehicles		Generators		Motor cycles and bicycles		Motor and Sprayers		Irrigation Sets		Cultivators and harvesters		Trailers		Irrigation Pumps		Other kinds		Adjusted Total	
	No. Units	Value L.E.	No.		No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Alexandria	152	2,264,000													1	3,950							153	2,271,900
Behiera	309	3,540,691	78	443,885	125	2,489,350	120	235,832			9,066	320,449	1,100	2,881,817	34	94,570	17	66,336	461	139,138	35	422,615	11,345	10,634,683
Kafr ElSheik	78	1,099,295	14	80,125	34	707,425	71	149,771	466	108,645	254	87,671	323	858,814	4	15,970	3	9,210	2	412	94	53,562	1,343	3,171,900
Gharbia	336	3,991,889	118	701,017	110	2,393,575					1,259	531,358	583	1,532,386	114	582,157	18	54,620			463	297,409	3,001	10,084,411
Dakahlia	627	7,203,539	638	3,690,362	88	1,896,775	3,189	970,699			371	400,040	1,710	4,490,045	125	686,597	5	17,555			438	3,233,902	7,191	22,589,514
Damietta	73	633,067	31	165,360	4	85,400	152	274,286	309	79,159	282	63,779	103	203,770	6	32,284	2	7,800	19	36,485	1,791	435,211	2,772	2,016,601
Sharkia	52	620,520	601	3,497,065	97	1,955,300	112	244,931	2,213	449,567	823	67,008	2,345	6,625,211	7	24,845			167	41,836	19	60,338	6,436	13,586,621
Ismailia	132	1,782,695	12	71,550	19	401,550	12	30,017	1	129	126	149,875	316	773,254	3	25,400	1	3,700	3	3,350	23	91,393	648	3,332,913
Cairo	16	241,911	2	5,000			2	5,156					15	37,523			1	3,750	1	4,908	2	30,500	39	328,748
Munofia	269	3,198,662	135	806,430	11	233,565	152	282,680	712	282,680	153	64,756	852	2,239,812	127	650,420	17	51,210	1	12,601	4,207	2,823,108	6,636	10,645,924
Kalubia	281	3,090,467	172	1,004,660	106	2,076,350	192	543,986	809	100,145	111	121,569	1,420	4,674,386	115	631,733	31	98,164	10	2,997	486	416,796	3,733	12,761,253
Giza	287	3,682,643	37	182,220	142	3,272,097	170	468,497	1,437	320,397	1,651	520,369	2,226	5,415,982	45	198,638	50	1,108,387	362	79,060	95	158,185	6,502	15,406,475
Beni Suef	317	4,386,417	180	1,028,075	30	684,723	153	269,502	1,526	319,073	819	434,413	2,391	6,529,799	7	29,573	196	200,602	45	32,162	5	3,650	5,669	13,917,989
Fayoum	245	3,086,574	32	186,300	67	13,888,770	13	29,712	329	178,463	64	44,407	110	266,692	1	5,300	13	57,295			337	297,177	1,211	18,040,690
Menia	539	7,082,953	385	2,658,650	39	855,350	59	138,636	1,234	2,561,231	3,236	620,297	2,969	6,534,175	175	745,602	49	179,822	7	39,210	39	72,002	8,731	21,487,928
Assiut	169	1,979,947	310	1,543,889	74	1,497,015	83	204,443	22	13,270	319	194,719	1,774	3,010,423	77	246,040	61	148,198	10	70,020	21	36,399	2,920	8,944,363
New Valley									829	158,531	1	1,400	1	1,513	2	7,575	3	55,700			12	14,240	848	238,959
Sohag	173	2,427,992	526	2,759,975	51	962,550	118	196,781	1,249	199,198	240	47,914	2,229	4,542,504	90	321,880	95	404,913	35	419,531	191	256,015	4,997	12,539,253

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Table II-6
(Continued)

a	446	6,176,200	208	831,676	193	4,620,659	229	470,947	918	289,985	12	7,004	1,572	4,035,029	22	100,110	105	426,820	16	177,095	55	105,498	3,776	17,241,023
man	75	953,137	28	170,875	2	37,050	86	160,942	3,242	469,329	154	85,547	527	589,808	21	100,907	26	147,332	24	8,515	64	41,968	4,259	2,765,410
. Arish	9	142,241			19	386,500	2	2,277	2	3,000	212	90,203	19	28,807	1	2,800	3	9,595	11	140,025	4	955	282	806,403
. Total	4,605	57,557,840	3,507	19,827,114	1,211	25,944,104	2,115	4,679,094	15,298	3,222,694	19,143	3,852,778	22,635	55,271,697	977	4,506,351	696	2,051,009	1,174	1,207,345	8,381	8,850,923	79,742	186,970,949
	4,585	57,584,840	3,507	19,827,114	1,211	38,444,004	4,915	4,679,095	15,298	5,533,802	19,163	3,852,778	22,585	55,271,750	977	4,506,351	696	3,051,009	1,174	1,207,345	8,381	8,850,923	82,492	202,612,961

Source : Commercial Affairs Division, PEDAC.

Table II-7

Stocks of Principal Items of Agricultural Machinery, Arab Republic of Egypt, 1981-2

Governorate	Total area a/ cultivated (000 feddans)	Wheel tractors b/ 50-65 hp	Plows	Pesticide spraying machines	Threshing Machines	Trailers	Available power for irrigation total hp	Governorate
Alexandria	74	469	135	63	15	28	4,447	Alexandria
Beheira	621	4,397	3,511	998	599	673	82,787	Beheira
Sharkia	388	3,650	4,339	1,708	813	2,476	44,335	Sharkia
Kafr El Sheikh	467	2,755	3,007	1,607	514	491	53,871	Kafr El Sheikh
Dakahlia	592	4,893	6,314	2,676	711	2,871	113,178	Dakahlia
Damietta	98	813	535	286	47	182	38,537	Damietta
Sharkia	611	4,180	4,286	1,949	730	2,958	45,090	Sharikia
Ismailia	63	612	562	90	45	410	11,360	Ismailia
Suez	6	76	71	9	9	22	2,275	Suez
Port Said	-	4	5	7	-	6	592	Port Said
Menufia	298	1,811	1,686	482	671	499	40,127	Menufia
Kalubia	146	1,070	1,275	392	343	874	18,600	Kalubia
Cairo	7	31	27	2	-	10	979	Cairo
Giza	162	1,250	529	96	247	107	35,629	Giza
Beni Suef	245	1,093	305	101	143	17	25,640	Beni Suef
Fayoum	296	2,073	1,485	322	9	685	3,990	Fayoum
Minya	382	2,616	1,625	1,445	662	831	62,292	Minya
Assiut	296	2,271	3,198	43	686	2,756	91,622	Assiut
Sohag	285	2,196	1,941	250	872	1,162	75,895	Sohag
Qena	167	1,773	1,276	67	511	725	101,872	Qena
Aswan	69	296	140	5	2	35	2,178	Aswan
Matruh	-	118	-	3	71	-	2,934	Matruh
New Valley	31	192	32	-	12	-	4,312	New Valley
North Siani	-	-	1	8	-	1	-	North Sinai
TOTAL	5,294	38,639	35,997	12,610	7,712	17,819	863,572	

a/ Except areas under sugar cane and horticultural crops
b/ Tractors except those delivered before 1970

Source: Economics and Statistics Undersecretariat, Ministry of Agriculture, Division of Agricultural Census (1981-1982).

Table II-8

Agricultural Equipment (Rabbit and Poultry Cages, Forage Choppers, Milk Separators, Milking Machines) Distributed by Agricultural Equipment Department 1986-7 and 1987-8

Governorate	Volume of Activity in L.E. 1986-7	1987-8
Alexandria	0	0
Beheira	0	1,065,540
Gharbia	3,423	180,242
Dakahlia	0	0
Kafr El Sheikh	155,158	9,779
Menoufia	0	0
Kalubiya	0	0
Damietta	0	0
Ismailia	0	0
Sharkia	5,000	0
Suez	0	0
Giza	16,945	15,877
Beni Suef	0	75,440
Fayoum	0	0
Menia	0	52,913
Assuit	36,696	0
Sohag	0	43,567
Qena	0	0
Aswan	0	0
New Valley	0	0
El Arish	21,446	0
Cairo	0	256
Total	238,668	1,443,614

Source: Agricultural Equipment Department, Commercial Affairs Division, PBDAC

TABLE II-9

Purchases of Sprayers in 1986-7 and 1987-8

Agricultured Inputs Division,

Spare Parts Department, PBDAC

Type of Equipment	No. of Items	Country of Origin	Purchase Date	Cost LE	Remarks
1. Sprayer set "Jenard" cap. of 600 litre	200	France	86/87	392,476	
2. Back sprayer	1500	Italy	86/87	198,663	
3. Sprayer set "Jenard" 600 litres	200	France	86/87	288,797	IMPORTED
4. Sprayer set "Jenard" 600 litres	200	France	86/87	529,881	86/87
5. Handle sprayer "Ronoi"	1000	France	86/87	44,423	
6. Sprayer set "Bordo" 150 litres	250	Italy	87/88	420,166	
7. Sprayer set "Jenard" 600 litres	100	France	87/88	296,190	IMPORTED
8. Back sprayer "Solo" 423	2000	Turkey	87/88	732,705	87/88
9. Sprayer set m[illegible]ted on tractor	150	France	87/88	648,194	
10. Sprayer set mounted on tractor	115	Tunisia	87/88	523,600	
11. Engine "Bernard" type 617	700	France	86/87	472,713	LOCAL
12. Sprayer set "Methel" from 600 litres	300	Egypt	87/88	852,300	PRODUCTION
13. Sprayers set 60 litres ca capacity	150	Egypt	87/88	551,250	

EFFECTIVE COST FACTORS:

A. Funds financed in local currency by MOA:
1. 3% Import Commission
2. 2% Committee expenses and allowances
3. 1% Reserve
4. 10% PBDAC Commission for receiving, storing and distributing

B. FUNDS FINANCED IN LOCAL CURRENCY BY PBDAC:
1. 3% Import commission
2. 1% Committee expenses, testing and pricing
3. 1% Reserve
4. 25% PBDAC Commission for financing, receiving, storing and distribution

Source : Spare Parts Department, Agricultural Inputs Division, PBDAC.

TABLE II-10

Livestock Population of Egypt: Reported for 1982-6, and as Estimated for 1988

Reported Numbers of Animals
(000)

Animal Type	1982	1983	1984	1985	1986	1988 a/
Buffaloes	2,393	2,412	2,430	2,447	2,502	2,200
Camels	76	72	68	68	68	500
Cows	1,826	1,772	1,743	1,709	1,855	2,500
Goats	1,498	1,520	1,542	1,563	1,583	
Sheep	1,394	1,280	1,157	1,149	1,149	300
Pigs	15	15	15	15	15	
TOTALS	7,202	7,071	6,955	6,951	7,172	5,500

a/ Estimated

Sources: Reported 1982-6 figures from Statistical Yearbook: Arab Republic of Egypt, 1988, Estimated 1988 figures from Central Administration for Animal Production, Ministry of Agriculture.

Table II-11

Livestock Slaughtered, 1982-87

Animal Type	Reported Numbers of Animals Slaughtered (000)					
	1982	1983	1984	1985	1986	1987
Buffaloes	73	78	65	78	102	93
Calves	594	505	419	462	478	480
Camels	50	64	77	128	88	49
Cows	36	43	41	35	43	36
Goats	22	23	24	32	33	38
Oxen	7	1	4	1	1	1
Pigs	64	62	62	66	72	61
Sheep	447	418	436	487	469	438
Veal	326	329	331	401	420	417
TOTALS	1619	1523	1459	1690	1706	1613

Source: Statistical Yearbook: Arab Republic of Egypt, June, 1988.

Table II-12

Total Production of Large Animal Feed by Public Sector
1980 - 1987

Year	Production Traditional Feed	Non-traditional Feed	(MT'000) Total
1980	1,361	-----	1,361
1981	1,325	-----	1,325
1982	1,524	-----	1,524
1983	1,447	-----	1,447
1984	1,504	-----	1,504
1985	1,456	73	1,529
1986	1,465	29	1,494
1987	1,393	189	1,582

Source: PBDAC and World Bank.

Table II-13

Estimated Non-subsidised Prices for Animal Feed Ingredients

November, 1986

Ingredients	Price (LE/Ton)	Traditional Feed Formulation (%)	Traditional Feed Value per Ton (LE)	Non-traditional Formulation (%)	Non-traditional Value per Ton (LE)
Yellow Maize	360	19.0	68	25.0	90
Wheat Bran	200	49.0	98	25.5	50
Cottonseed Cake	400	25.0	100	15.0	60
Roughages	1600	---	---	25.0	40
Urea	500	---	---	1.5	8
Molasses	100	3.0	3	---	6
Limestone	108	3.0	3	---	---
Trace Minerals	9,229	---	---	1.0	92
Salt	146	1.0	1	1.0	1
Total		100.0	273	100.0	347

Source: World Bank.

Table II-14

Projected Distribution of Animal Feed by PBDAC in 1989 (1000 Tons)a/

Governorates	National Veal Project, Ph. I (1)	National Veal Project, Ph.II (2)	Government Authorities & Companies (3)	Misr Dairy Producers (4)	Quarantine Stations & Fish Ponds (5)	Military Stations & Prisons (6)	Total Columns 1 to 6 (7)	Governorate Fattening & Dairy Projects (8)	Total Traditional Feed (9)	Non-Traditional Feed (10)	Total Traditional & Non-Traditional Feed (11)
Alexandria	5.7	11	9	0.5	3	1.5	30.7	25	55.7	12	67.7
Marsa Matruh	-	-	-	-	-	-	-	4	4	12	16
Beheira	10.4	30	28	0.7	0.6	20	89.7	65	154.7	30	184.7
Gharbia	20.1	3	2	17	-	-	42.1	58	100.1	28	128.1
Kafr el-Sheikh	11.5	18	7	1.8	1	-	39.3	33	72.3	15	87.3
Dakahlia	22.3	26	2.3	3.5	0.6	-	54.7	65	119.7	30	149.7
Sharkia	22.6	37	20	6	0.2	11	96.8	58	154.8	28	182.8
Menufia	22.3	1.6	2.4	3	-	-	29.3	45	74.3	20	94.3
Damietta	1.4	4	12	2.5	0.5	-	20.4	17	37.4	8	45.4
Ismailia	1.4	39	-	-	0.2	2	42.6	9	51.6	4	55.6
Suez	-	-	-	-	1.5	2	3.5	6.5	10	2.5	12.5
Port Said	-	-	-	-	-	-	-	20	20	5	25
Kalyubia	8.6	11.9	1	0.2	0.2	0.4	22.3	45	67.3	20	87.3
Cairo	-	-	-	-	10	0.3	10.3	6	16.3	3	19.3
Giza	7.9	4.5	-	0.3	0.2	0.6	13.5	55	68.5	22.5	91
Fayoum	5	13.5	-	4.5	-	-	22.9	38	60.9	19	79.9
Beni Suef	1.4	2.1	1.2	-	-	-	4.7	21	25.7	13	38.7
Menia	14.4	5.1	5.1	-	0.2	-	24.7	41	65.7	20	85.7
Assiut	10.8	0.1	-	-	-	-	10.9	46	56.9	20	76.9
Suhag	10.8	1.3	-	-	-	-	12.1	46	58.1	20	78.1
Qena	2.1	-	0.8	-	-	0.2	3.1	28	31.1	12	43.1
Aswan	0.7	2.7	4.2	-	-	-	7.6	14	21.6	6	27.6
Red Sea	-	1.8	-	-	-	-	1.8	2	3.8	1	4.8
North of Sinai	-	0.5	-	-	-	-	0.5	11.5	12	1.5	13.5
West of Sinai	-	-	-	-	-	-	-	5	5	1	6
New Valley	-	-	-	-	-	-	-	7.2	7.2	2	9.2
TOTAL	179.4	213	95	40	18	38	583.4	771.2	1,354.6	355.5	1,710

a/ Discrepancies between figures in lines and totals due to roundings.

Source: PBDAC

TABLE II-15

Distribution of Large Animal Feed by PBDAC (1984-5 - 1987-8)

Governorate	1984-5	1985-6	1986-7	1987-8	
A. Lower Egypt					
Alexandria	126,668	102,539	95,161	129,244	8.6
El-Behera	91,776	86,212	95,225	108,032	7.2
El-Gharbia	44,550	63,727	55,868	110,144	5.2
Kafr El Sheik	56,934	73,538	55,988	67,813	4.8
El-Dakahlia	115,455	151,625	118,638	159,970	10.3
Damietta	41,312	53,694	46,418	57,271	3.8
El-Sharkia	78,937	85,333	82,878	84,363	6.3
Isamilia	11,567	9,064	10,968	10,515	0.8
Suez	17,425	17,740	15,571	12,700	1.2
El-Monufia	68,169	67,942	60,034	74,679	5.1
El-Kalyubia	80,179	90,297	89,303	80,431	6.4
Cairo	0	0	0	0	0.0
Port Said	78,937	85,333	82,878	22,800	5.1
TOTAL	811,909	887,044	808,930	917,962	64.8
B. Middle Egypt					
Giza	72,103	92,849	77,286	90,436	6.3
Beni Suef	41,546	43,322	48,329	40,388	3.3
El-Fayoum	61,953	60,002	42,522	48,400	4.0
El-Menia	68,397	69,631	74,291	78,320	5.5
TOTAL	243,999	265,804	242,428	257,544	19.1
C. Upper Egypt					
Assyout	80,682	63,341	77,131	67,891	5.5
Sohag	76,518	75,453	73,216	92,429	6.0
Qena	43,247	42,501	42,434	36,683	8.1
Aswan	14,816	22,732	20,085	21,735	1.5
TOTAL	215,263	204,027	212,866	218,738	16.1
D. Other					
New Valley	6,390	6,306	6,212	6,636	0.5
Al-Arish	13,883	13,276	13,757	13,616	1.0
TOTAL	20,273	19,582	19,969	20,252	1.5
GRAND TOTAL	**1,291,444**	**1,376,457**	**1,284,193**	**1,414,496**	**100.00%**

Source: PBDAC and World Bank

TABLE II-16

Production and Distribution of Large Animal Feed, 1987

Feed Quantities (MT 000)

Producing Governorate	Traditional Feed	Non-traditional Feed	Total	Receiving Governorates
Alexandria	205	48	253	Alexandria, Beheira, Matroah, Kafe El-Sheik, Menufia, Minia, Port Said, Suez
Gharbia	424	85	509	Gharbia, Sharkia, Kafr El-Sheik, Menufia, Beheira, Beni Suef, Fayoum, Qena, Arish, Port Said, Suez, Aswan
Kalyubia	93	-	93	Kalyubia
Menufia	19	-	19	Menufia
Beheira	67	13	80	Beheira
Damietta	50	15	65	Damietta
Dakahlia	146	22	168	Dakahlia, Sharkia, Menufia, Kafr El-Sheik
Giza	101	2	103	Giza, Beni Suef, Fayoum, Qena, Aswan
Minia	66	-	66	Minia
Assyut	108	4	112	Assyut, Beni Suef, Fayoum, Qena, Aswan
Sohag	114	-	114	Sohag, Beni Suef, Fayoum, Qena, Aswan
Total a/	1,393	191	1,581	

Source: PBDAC and World Bank.

a/ Differences due to roundings.

Table II-17

Ownership, Capacity, and Production of Poultry Feed Mills 1987

Owner	Production Capacity (Tons/Year)	Actual Production (Tons/Year)	Percentage of full Capacity
Investment Company (Private)	1,434,312	910,644	63.5
Individuals/Families (Private, small mills)	1,335,600	330,000	24.7
Public Sector Companies	120,960	23,988	19.8
General Poultry Co. (Public)	600,000	456,000	76.0
On Farm Mills	245,000	245,000	100.0
Total	3,735,872	1,965,632	52.62

Source: U.S. Feed Grains Council and World Bank.

III. ORGANIZATION AND STAFFING OF PBDAC

Introduction

3.1. This chapter describes the functions, organization, and staffing of the Principal Bank for Development and Agricultural Credit (PBDAC) so as to provide a basis for analyzing the possible impact privatization options on PBDAC in these respects. The chapter begins with a general characterization of the roles and interagency relationships of PBDAC. It proceeds then to a review of its functions and the organizational structure through which those functions are performed. Finally, it describes the staffing of PBDAC and the functional deployment of personnel, and characterizes staffing insofar as available data permit, providing data of possible relevance for assessing the implications of various privatization options for the personnel of PBDAC.

Roles and Relationships of PBDAC

3.2. PBDAC, established by law in 1976 and operational in 1977, was created to facilitate the availability of credit for the production, processing, and distribution of agricultural products, and the distribution of agricultural production inputs. From these basic objectives have come (a) facilities which afford the full range of banking services throughout the nation and means of mobilizing savings for agricultural credit needs; and (b) an elaborate nationwide network for supplying agricultural production inputs, a network which is also used to facilitate the entry of farm products into the nation's distribution channels.

3.3. PBDAC's role as the nation's principal supplier of agricultural inputs goes beyond making inputs conveniently available for farmers. It is involved in participating in the domestic and overseas procurement of inputs or raw materials therefor. It shares in the processes of inviting and evaluating tenders by suppliers; in arranging for the receipt, clearance, and onward movement of production inputs or their components; and in planning and arranging for their distribution to processing establishments and to end users through its own system of storage facilities. As agent for other governmental entities, it arranges financing for the acquisition of ingredients and finished articles for agricultural production.

3.4. Egypt's agricultural sector operates on the basis of a high degree of centralized planning and control, and in an economic setting characterized by the widespread use of state enterprises in producing, transporting, and trading operations, even though state enterprises do not exist to the exclusion of private firms in all these areas.

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3.5. State plans and controls affecting the agricultural sector are manifold. They extend from the preparation of cropping plans which take account of the intentions of millions of individual farmers and additionally seek to aid the achievement of the production of governmentally targeted quantities of certain crops, particularly cotton, rice, and sugar cane. The attainment of these targets is sought through land-use allocations. The land-use and cropping plans so determined are the sources of estimates of input "requirements". Crop production plans are supported by a system of production subsidies, typically for the supply of input elements of critical importance in achieving production goals. Prices of inputs are established to take account of the need for subsidies to achieve production plans and to recover the costs of distributing inputs through PBDAC, as well as the maintenance of that organization's financial viability.

3.6. Prices to farmers for controlled crops are likewise governmentally established; for other agricultural products they may be influenced to a degree by official decisions which take account of both supply and governmental regard for the economic accessibility of foodstuffs for consumers.

3.7. The input "requirements" as determined on the basis of production targets and cropping plans often have to be modified. These changes come about especially from three types of constraints. First, many inputs are dependent on purchases at world prices, and the total supply of foreign exchange is limited in comparison with the strong and widespread competition for these resources. Second, even for inputs produced within the country, the needs of agriculture must compete with those of other sectors. Finally, input availabilities from domestic sources are controlled at least by the pricing policies deemed necessary for state and private enterprise suppliers. The consequent changes may involve such expedients as the substitution of less desirable and less expensive (in local and foreign currency) ingredients, the reduction of total supply, or absolute shortages which may give rise to black market operations.

3.8. The Ministry of Agriculture is the principal governmental agency for making recommendations and taking decisions and actions on matters of agricultural policy and practice. Those of its recommendations considered to have major importance for the agricultural sector, for the positions of farmers and consumers, and for available stocks of foreign exchange typically involve review and final decision by higher authorities.

3.9. Although legal responsibility tends to rest with the Ministry, PBDAC is more than a mere instrument for giving effect to Ministry policies in the areas of input supply and agricultural credit. Much policy deliberation is performed by interagency committees. PBDAC is represented on a number of these bodies as they consider sectorial and national goals and ways of achieving them. Among

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such continuing and ad hoc bodies are those concerned with the application and levels of subsidies, the importation and production of inputs, and similar matters.

3.10. PBDAC's involvement with the contents and administration of agricultural policy extends beyond the Ministry of Agriculture to include relationships with agencies such as the Ministries of Planning and Finance (sectorial plans, allocations from general funds, and supplies of foreign exchange); the Ministries of Industry and Supply (in the composition, production, and pricing of inputs supplied by governmental factories); and the Ministry of Transport (transportation facilities and charges).

3.11. These various intergovernmental relationships are among PBDAC's central responsibilities in the distribution of production inputs and the provision of agricultural credit. The agricultural credit operations of the Bank are the subject of a major concurrent improvement project and will not be discussed further in this chapter except insofar as privatization options for input activities may affect or be affected by PBDAC's credit operations.

The General Organization of PBDAC

3.12. The Principal Bank for Development and Agricultural Credit comprises an integrated system for the supply of production inputs for producers, of credit for agricultural producers, processors, and marketers, and of general banking services throughout the nation. This system consists of the Principal Bank, Governorate Banks, District and Village Banks, and Agencies, the latter existing largely for the supply of inputs purchased by users on the basis of loans extended through the banking system. The physical facilities of the system are extensive, both owned and leased, for banking and support offices and for the storage of inputs pending entry into PBDAC's distribution channels organized to serve the convenience of farmers. Work of the various levels and subdivisions of the Bank is performed in accordance with centrally established procedures, and applications for credit move upwards in the system for final decision depending upon the amount and purposes of requested loans. Adherence to established policies and procedures is secured through hierarchical administrative arrangements. The correctness and legality of financial and administrative transactions are audited by central and subordinate internal agencies of inspection and control.

3.13. The organizational and physical extent of PBDAC is reflected in a measure through the following tabulation:

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Operational Level	No. of Units
The Principal Bank (PBDAC)	1
Governorate Bank (BDAC's) a/	17
District Banks (Branches)	152
Village Banks	787
Principal Storage Areas	519
Agencies (Mandubias)	4,352

a/ PBDAC operates in and through other governorates (Alexandria, Cairo, Port Said, and Suez), but these arms are directly administered by the Principal Bank rather than through separate governorate banks.

Source: Planning and Organization Sector, PBDAC.

3.14. The geographic reach of this structure is suggested by the facts that it extends directly into almost every village of any consequence and its agencies/mandubias (agency storage facilities) are so located that few farmers are more than a few kilometers distant from a local supply center.

Functional Assignments within PBDAC's Structure

3.15. The governing authority for policy determination and general oversight of the Principal Bank is its Board of Directors. This body, by law, includes the Bank's Chairman, appointed by the President of the Republic on recommendation of the Minister of Agriculture; two Deputy Chairmen; the Undersecretaries of State of the Ministries of Agriculture, Finance, Economy, Supply, Local Government, and Planning, each appointed by the respective minister; a representative of the Central Bank of Egypt, who is chosen by the Bank's Governor; a legal consultant from the Council of State, chosen by the Council's President; the Chairman of the Central Agricultural Union; three persons concerned with cooperative and agricultural affairs, named by the Minister of Agriculture; and eight chairmen of governorate banks, four each from Upper and Lower Egypt, designated by the Minister of Agriculture.

3.16. In recognition of the diversity of Egypt, the desire for decentralization, and the need for interagency coordination at the regional level, each of the 17 governorate banks has a governing Board of Directors consisting of its Chairman; two ranking employees of the PBDAC's staff; two non-employee members, one nominated by the Governor and one by the Minister of Agriculture; an Undersecretary of State for the Ministry of Agriculture in the Governorate; one labor representative; one person entitled to participate in board deliberations but without voting right; and

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the Chairman of the Central Agricultural Cooperative of the governorate.

3.17. The general organizational structure of PBDAC is presented through Exhibits III-1, III-2, and III-3, which follow this chapter. The first of these portrays the overall organization of PBDAC; the second, that of the BDACs; and the third those of the district and village banks. The exhibits for the governorate, district, and village banks are generalized portrayals, for there are considerable difference among these subdivisions in volume of work, numbers of employees, and decisional authority. These differences are suggested through the two tabulations below, which do not include subdivisions or employees in branches directly administered by PBDAC's central staff.

Type of Bank Subdivision	Total No. of Subdivisions	Next Smaller Subdivision	No. of Smaller Subdivisions Smallest/Arith. Ave./Largest		
Governorate	17	District	2	8	23
District	143	Village	5	44	79
Village	755	Mandubia	4	6	7
Mandubias	4,238	-	-	-	-

Type of Bank Subdivision	Total No. of Employees	Nos. of Employees per Subdivision Smallest	Arith Ave.	Largest
Governorate	4,317	112	254	344
District	8,949	33	63	90
Village	18,209	19	24	30
Mandubia	(6,140)	1	1	2

Source: Data provided by Planning and Organization Sector, PBDAC

3.18. PBDAC has simplified the structures of governorate, district, and village banks in recognition of differences in work volume and numbers of employees. Accordingly, governorate banks are divided into four classes and district and village banks into three. At the governorate level the main differences in organization among the four classes are in (a) the presence of the post of general manager as an intermediary between the chairman and the operating, financial, and administrative units in the two larger classes of governorates but not in the smaller classes; and (b) the number of staff and service units that are separately identified as reporting to the chief executive. Structure becomes simpler, too, in moving from larger to smaller districts and villages. At all three levels there is a basic parallelism, in that the responsibilities are grouped into a few general areas of responsibility, those of financial and general administration; inputs, storage, and supply; and credit and development. In each governorate bank, but not in a formal organizational sense in the lesser subdivisions, there is a control and inspection (auditing)

unit.

Central Organization of PBDAC

3.19. The accompanying Exhibit III-1 shows the central organizational structure of PBDAC's headquarters and to a degree suggests the areas of responsibilities within that structure. The responsibilities of component units are reviewed below. As Exhibit III-1 indicates, PBDAC's Chairman is assisted by two Deputy Chairmen. One of these is responsible for directing the input, supply, and crop marketing functions of the organization, while the other is concerned with banking operations and with financial and designated aspects of the general management of PBDAC. Both officers assist the Chairman in discharging his broader responsibilities. Other major features of organization and functional responsibilities are described in the next following subdivisions.

3.20. **Organization for Planning, Direction and Control.** The principal branches of PBDAC for these purposes report directly to the Chairman. They include the following sectors:

1. **The Sector of the Affairs of the Chairman's Office.** This sector provides immediate office and allied assistance to the Chairman and Board of Directors; conducts public information services; receives and investigates complaints on behalf of the Chairman and the Board; and inquires into and reports on matters of direct concern to the Bank's top leadership.

2. **The Legal Affairs Sector.** This sector serves as the general legal counsel to the Bank. In doing so it drafts or reviews legislation, regulations, decrees, contracts, and other legal documents; provides legal advice on matters affecting the operations of the Bank; represents the Bank before courts and administrative bodies, preparing for and conducting appearances as necessary; and conducts investigations involving possible violations of laws and regulations.

3. The Planning and Organization Sector. Its responsibilities extend to assessing the future circumstances and needs of the Bank and assisting in the development of programs, program modifications, and budgets accordingly, estimating the financial and related resource prospects and requirements in connection therewith; evaluating the organization, management, and staffing of the Bank and recommending improvements; developing and maintaining the Bank's job classification and pay structures and its manning tables; and planning, overseeing, and conducting

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training programs for new and continuing staff.

4. **The Information Systems Sector** is a new sector, currently staffed with personnel assigned from other sectors. It is responsible for technical direction, guidance, and services in the modernization and computerization of all information flows and associated procedures of the Bank. This effort looks to the replacement of the Bank's manual systems of program, activity, and financial management information with a system-wide installation of modern computer and telecommunications facilities and services.

5. **The Control and Inspection Sector**. This is the Bank's internal auditing and inspection branch. Its role is broadly conceived in that responsibilities go beyond financial processes and transactions to include inspections and appraisals of subordinate components of the PBDAC system for adherence to established policies and procedures and participation with the Legal Affairs Sector in investigating improper or illegal conduct.

6. **The Development and Investment Sector**. This sector is concerned with forward planning and appraisal for agricultural, agribusiness, and associated industrial development projects, and with assembling basic data for the appraisal and prosecution of such projects. Much of the work of this sector centers on reclamation, new lands, and industrialization projects. The evaluation of such projects once undertaken is a further responsibility.

3.21. Banking, Credit, and Financial and General Management. Responsibilities in these areas have been assigned to one of PBDAC's two deputy chairmen. These operational and management sectors are described below.

1. **The Financial and Management Affairs Sector** is responsible for general and cost accounting, preaudit and settlement of outstanding accounts, and preparing consolidated balance sheets and income and expense statements. It also formulates procedures for these processes in subordinate levels of the PBDAC system. Furthermore, it is the central personnel and payrolling agency and oversees the provision of medical assistance for bank staff. It has responsibility for the design, construction, maintenance, and operation of physical facilities, and the procurement of supplies and equipment for general administrative needs (as distinguished from input program needs). Thus this sector is essentially a part of the Bank's organization for financial and general as distinct from program management.

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2. **The Finance and Banking Services Sector** is a relatively new addition to the Bank's organization and operates with personnel detailed from other branches of the Bank. This sector is intended to serve as PBDAC's arm for planning banking and credit policies and providing general program leadership and guidance for investment and production credit operations, including the marshalling of funds from foreign and domestic sources for agricultural purposes.

3. **The Credit and Marketing Sector** has responsibilities which in a sense bridge PBDAC's activities in helping with the marketing of crops and the planning and provision of credit in connection with these operations. It is the central point for the Bank's concern with and provision of credit for producer and marketing cooperatives.

3.22. **Input and Allied Functions**. The second of the two deputy chairmen of PBDAC is responsible for the general area of Commercial Affairs, Production, Storage, and Branches. This post carries principal responsibility for planning and directing the input and allied operations of the Bank and in representing the Bank in relations with the Ministries of Agriculture, Finance, Supply, Industry, and Planning and their dependencies and with cooperatives, the farmers of the nation, and the private sector as involved with the supply of production inputs. The activities in this broad area are described in the paragraphs that follow. These deal first with the Production, Commercial, and Storage Affairs Sector, and then with the two subsectors for Branch Affairs directly administered from PBDAC headquarters. One of the latter is for the Governorate of Alexandria and Matroah, the other for those of the Governorates of Cairo, Port Said, and Suez.

3.23. **The Production, Commercial, and Storage Affairs Sector** is responsible for planning, organizing, coordinating, and directing the procurement, transport, and delivery to governorate warehouses and shonas of agricultural production inputs. These responsibilities are divided among three general departments:

1. **The General Department of Inputs,** with responsibility for the indicated functions in relation to fertilizers, pesticides, seeds, and sprayers, with the exceptions noted below.

2. **The General Department of Commercial Affairs** has responsibilities in these same respects with respect to agricultural machinery, agricultural chemicals (foliar and other specialized fertilizer products), seeds, and pesticides sold on a contingency basis for private dealers.

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3. The activities of the **General Department of Storage and Supply** concern the procurement and distribution of supplies of animal feed and jute bags, and the planning and oversight of the maintenance and operation of product and crop storage facilities for the receipt and distribution of inputs and farm products.

3.24. The **Branches Sector** combines responsibilities in (a) the procurement from abroad and from domestic production facilities of inputs, associated port entry and reception services, and the planning and onward movement of supplies; (b) the provision of input supply needs for agricultural production in the Metroah, New Valley, and Arish areas; and (c) credit operations centering upon the Alexandria, Cairo, Port Said, and Suez Governorates, as well as those of Metroah, New Valley, and Arish.

Summary of Findings and Conclusion

3.25. These may be summarized as follows:

1. The general organization structure of PBDAC is sensibly related to its basic responsibilities.

2. As an organization serving both the credit and input areas of the Bank's program operations, the Financial and Management Affairs Sector might more appropriately report directly to the Chairman or, alternatively, to third deputy chairman responsible for directing and coordinating all general planning, staff, and support functions for PBDAC.

3. Within the area of Commercial Affairs, Production, and Storage, general orderliness prevails with some exceptions. These include the artificial distinction between Inputs and Commercial Affairs. Combination of these two general departments would serve to give full responsibility for input categories to one general department. The present arrangement artificially divides responsibility for input components of fertilizers, seeds, pesticides, and machinery.

4. The intensive study towards the improvement of the Bank's credit operations now in progress will no doubt consider the future role and relationships to credit planning and management of the activities of the Sectors of Credit and Marketing and Development and Investment. The need for such an examination and the application of its findings are beyond the scope of the privatization project.

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The Staffing of PBDAC

3.26. The purpose of this section is to provide an initial basis for considering the implications for the staff of PBDAC of input privatization options. This basis is a limited one in several important ways:

- Data were obtainable only with respect to the numbers of authorized, budgeted positions, their general responsibilities, and their pay levels in terms of base pay.

- PBDAC was unable to supply information on: (a) the extent and costs of temporary and seasonal employment, asserting that the extent of such employment is inconsequential as well as impossible to provide; (b) length of service and turnover of staff; and (c) the age and sex distribution of personnel.

Thus, apart from detail on authorized positions, it has been necessary to work from aggregated figures on numbers of positions and personal service costs and to draw inferences about the characteristics of PBDAC's work force from general population and labor force data.

PBDAC's Personnel Strength

3.27. The reported authorized personnel strength of PBDAC is presented through the accompanying Tables III-1, III-2, and III-3. Table III-1 shows the distribution of that strength by organizational level and among the major functional areas of (a) input supply, (b) banking and credit, and (c) general administrative direction, control, and support. Table III-3 presents information by major function for the governorate, district, and village banks, by governorate. These figures are as reported by PBDAC's Planning and Organization Sector. Table III-2 compares information drawn from personnel strength data and information derived from PBDAC's income and expense statements for 1987-8.

3.28. The figures in Tables III-1 and III-3 (authorized personnel strength data from PBDAC) require explanation and qualification:

1. With respect to the distribution of the Bank's headquarters personnel, the count for input employees seems conservatively correct, with 432 of a total of 2,392 positions so assigned. The allocations to administration and finance may well be overstated. The total of 1,714 includes among others the following sectors: Financial and Administrative Affairs, 1,016 positions; Development and Investment Project Affairs, 160; and Credit and Marketing Affairs, 86. On the basis

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of reported responsibilities and the very nature of the Bank's headquarters functions, it seems likely that a significant number of these posts should instead be assigned to banking and credit.

2. The figures of Table III-1 show a large proportion (62.5 percent) of the total personnel strength of the directly administered branches for input activities. This figure is based in part upon the Bank's own allocation of personnel to input activities in Arish, Matroah, New Valley, and other operations. Largely, however, the allocation to inputs is based upon estimates based upon the nature of the Bank's operations in the port areas in receiving, clearing, storing, planning, and accomplishing the onward movement of inputs through PBDAC's supply system.

3. At the level of the 17 governorate banks, Table III-1 shows an average of about 50 input personnel per bank. This may be a conservative statement of personnel strength engaged directly in supply activities in the light of the storage and onward movement responsibilities of the governorates and governorate level storage facilities. At the same time it is at least possible that the allocations shown in Table III-1 overstate strength in administration and finance and understate it for banking operations.

4. Table III-1's allocation to input functions at the level of district banks appears at least plausible, in view of an average of about 20 input posts per district bank. As in the case of governorate banks, administrative and finance may be overstated and inputs and banking and credit understated.

5. At the level of village banks and agencies, it is assumed that agency (mandubia) employees (one or at most two per mandubia) are properly assignable to input activities. Subtraction of the total of 6,140 mandubia positions from the total of 7,452 for village banks including mandubias, leaves something less than two input employees per village bank. Again, as in the case of other bank levels, some reallocation from the administration and finance area to banking and credit and some to input and supply might well be warranted, because the administration and finance category includes many guards and allied workers engaged in looking after input storage areas.

3.29. Uncertainties about allocations of personnel strength reflected in Tables III-1 and III-3 suggested strongly the need to examine Table III-1 data in relation to figures derived from

PBDAC's 1987-8 financial statements. The accompanying Table III-2 provides a concise comparison of data from the two sources. Data taken from the Bank's financial statements are for: (a) total direct costs as distributed between the input and banking and credit operations and total indirect costs (overhead); and (b) total personal services costs as divided by financial statements between input, banking activities, and indirect costs. Based upon these relationships, personnel strength as reported by PBDAC in Table III-2 is distributed among direct input, direct banking, and overhead operations (administration and finance), and among input, banking, and indirect activities on the basis of their respective shares of total personal services costs.

3.30. Comparison of the figures from the sources used for Table III-1 and Table III-2. in the context of what is understood and reported about the Bank's activities, suggests several observations:

- The distribution of personnel strength (Line C, Table III-2) on the basis of direct and indirect costs appears to understate personnel actually engaged in input supply and administration, and to overstate the numbers engaged in banking and credit.

- The distribution of total personnel strength (Line D, Table III-2) between input and banking operations on the basis of personal services costs seems more nearly realistic, but may overstate banking's share of general administrative costs.

- The figure of 12,543 shown as engaged directly in input activities by Line D, Table III-2, is clearly in line with the corresponding figure of 12,618 shown in Table III-1.

- The figure of approximately 15,000 for personnel strength engaged in input and directly supporting administrative activities (12,543 + 42.2 percent of 5,618, or 2,371 = 14,914) (Line D, Table III-2) seems more acceptable as an approximation of personnel assignable to input activities directly and to directly supporting administration services.

- For the possibility that 15,000 may understate inputs' true share of total personnel strength, it seems desirable to adjust that share upwards by about 10 percent of the 15,000 figure to 16,500. This is especially desirable in view of the absence of information about seasonal and temporary employment in the physical movement of heavy tonnages of inputs.

3.31. For the remainder of this discussion of the staff

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implications of privatization, the figure of 16,500 will be used as the count for inputs and supporting administrative employment. This total should not be taken, however, as a true measure even in general terms of the real need of input operations for staff. Governmental policies and observation of work sites suggest that within PBDAC, and possibly elsewhere in governmental and parastatal operations, staffing beyond actual program needs is present.

General Privatization Implications for Staff

3.32. The possibility of full privatization of PBDAC does not entail an immediate threat to the Bank's employees directly and indirectly involved with input supply operations. A gradual though perhaps uneven decline in personnel requirements may be anticipated over a period of transition to full privatization. The rate of the decline is likely to be associated with the rate of privatization for supply categories involving large bulk (fertilizer, feed) and numerous transactions (pesticides). Only after the sequence of timing of privatization has been determined firmly, can reductions in personnel be forecast with any reliability.

3.33. Once a firm decision by government has been taken to proceed with privatization, however, a series of policies should be made effective. These policies should be adopted and applied even before the actual initiation of the privatization program, so as to mitigate abrupt terminations. The policies so adopted might well include the following:

1. A policy of no new hires should be instituted immediately and maintained throughout the transition period, except as replacements are required urgently for qualified workers in posts of critical importance. This policy might well be established for all operations of the Bank, not merely for input and its supporting overhead activities. Exceptions to the policy should be permitted only with the prior personal approval of the Chairman of the Board of the Principal Bank.

2. Early retirements should be encouraged, by a system of incentives in addition to benefits available under existing retirement arrangements. Such incentives might take the form of governmental financing of the costs of additional periods of creditable service to be applied in the calculation of retirement benefits or of supplementary cash payments for early retirements based upon the length of service and compensation level of individual employees.

3. Other voluntary separations should be encouraged by a plan of cash benefits for employees truly surplus to operating needs during the privatization transition period.

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4. PBDAC should plan, organize, and assist in carrying out free or subsidized training for input employees geared to their possible entry into private sector input supply services or other employment, especially employment where skills may be in short supply. Representatives of private firms should be encouraged to participate in planning and conducting such training.

3.34. Data on age, sex, education, and length of service of PBDAC personnel were not obtainable. Nor is information available about the ability and willingness of PBDAC or the Government of Egypt to bear the costs of inducements for early retirement, other separations, or special training. Thus it is difficult to evaluate with assurance the utility or costs of the measures outlined above. The following paragraphs, however, may offer some indications of possible effects on staff size and cost dimensions.

3.35. The tabulation below, derived from 1984 labor force age distribution figures, may roughly approximate the age distribution of the staff of PBDAC engaged in input and its supporting administrative services.

Age Grouping	**Number**	**Percentage**
Under 30 years	4,463	27.0
30 - 34	2,689	16.3
35 - 39	2,507	15.2
40 - 44	2,274	13.8
45 - 49	1,843	11.2
50 - 54	1,695	10.3
55 - 59	1,029	6.2

3.36. Attrition, from scheduled retirements, death, disability, and other voluntary or involuntary separations, is likely in total to be quite low, given the nation's high rates of un- and under-employment. Retirement is mandatory at age 60. (A summary of policies governing the calculation of benefits under the nation's social security scheme is included at the end of this chapter). Over a five-year transition period, the assumed employee population of 1,029 in the oldest age group could be expected to reach retirement age or earlier death or disability. Assuming an attrition rate from separations of other than retirees of two percent per year for the remainder of the employed population, the total from retirements and such other separations during a five year period might be expected to reach a total of as much as 3,500 to 4,000.

3.37. Under a scheme of inducements for voluntary separations, with average payments approaching average total compensation per year, the preceding figure might be increased by as much as 2,000 to 2,500, although this figure is speculative. Thus total

separations, by retirement, other normal attrition, and bonus-induced separations might be expected to reach 5,500.

3.38. Gross personal service cost reductions for the five-year period might be expected to reach about LE 52 million for 5,500 positions, assuming average annual total compensation at 1987-8 levels (LE 4,720 per employee per year), and assuming further that all annual separations take place at year's end.

3.39. Accompanying these reductions would be the loss of revenues for PBDAC from a reduced level of input activity during the assumed transition period, coupled with additional costs incurred for training and out-placement services. These additional costs, to say nothing of the costs of retaining surplus workers in pay status during the transition period, are impossible to estimate.

General Conclusion on Staff Impact

3.40. Given a transition period of five years from the present level of PBDAC's supply operations to their termination, it seems conservative to estimate that as many as 11,000 of PBDAC's input supply and allied administrative workers may well be without employment at the end of the period. In terms of total compensation (base pay plus incentives and fringes), 11,000 employees may account for some L.E. 52 million in total direct personal services costs per year at 1987-8 levels for PBDAC as a whole. Obviously the implications of privatization of PBDAC's supply and associated management services have serious financial and social implications for a government deeply concerned about levels of under and unemployment.

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TABLE 1

Livestock Population of Egypt: Reported for 1982-86, and as Estimated for 1988

Animal Type	Reported Numbers of Animals (000) 1982	1983	1984	1985	1986	Estimated 1988 (000,000) No.
Buffaloes	2393	2412	2430	2447	2502	2.2
Camels	76	72	68	68	68	0.5
Cows	1826	1772	1743	1709	1855	2.5
Goats	1498	1520	1542	1563	1583	}
Sheep	1394	1280	1157	1149	1149	}
Pigs	15	15	15	15	15	} 0.3
TOTALS	7202	7071	6955	6951	7172	5.5

Sources: Reported 1982-86 figures from Statistical Yearbook: Arab Republic of Egypt, June, 1988, Estimated 1988 figures from Central Administration for Animal Production, Ministry of Agriculture.

Table III-1

Distribution of Authorized Personnel

by Organizatiional Level and Function:

Principal Bank for Development and Agricultural Credit

1989

Organizational Level	Numbers of Authorized Personnel by Function						
	Inputs		Banking		Administration		Total
	No.	Percent	No.	Percent	No.	Percent	
PBDAC Central Administration	432	18.1	246	10.3	1,714	71.6	2,392
Centrally Administered Branches	916	62.5	138	9.4	412	28.1	1,466
Governorate Banks	853	19.8	757	17.5	2,707	62.7	4,317
District Banks	2,965	33.1	1,170	13.1	4,814	53.8	8,949
Village Banks and Agencies	7,452 (6,140)	40.9	4,405	24.2	6,352	34.9	18,209 (6,140)
TOTAL	12,618	35.7	6,716	19.0	15,999	45.3	35,333

Source: Planning and Organization Sector, PBDAC.

TABLE III-3

Approximate Functional Distribution of Authorized Employment, Governorate, District, and Village Banks (Including Agencies)

Governorate	Inputs		Banking		Administration		
	No. of Staff	% of Total	No. of Staff	% of Total	No. of Staff	% of Total	Total Staff
Dakahlia	40		59		192		391
Districts	236		90		470		796
Villages	813		430		664		1,907
TOTAL	1,089	36.4	579	19.3	1,326	44.3	2,994
Sharkia	318		43		46		407
Districts	584		242		84		910
Villages	736		617		307		1,660
TOTAL	1,638	55.0	902	30.3	437	14.7	2,977
Beheira	49		56		203		308
Districts	239		99		505		833
Villages	824		437		641		1,902
TOTAL	1,112	36.4	592	19.4	1,349	44.2	3,053
Gharbia	40		61		207		308
Districts	207		71		412		690
Villages	573		403		511		1,487.
TOTAL	820	33.0	535	21.5	1,130	45.5	2,485
Menufia	45		61		182		288
Districts	168		76		361		605
Villages	549		257		350		1,156
TOTAL	762	37.2	394	19.2	893	43.6	2,049
Minia	38		45		151		234
Districts	263		79		466		808
Villages	613		356		609		1,578
TOTAL	914	34.9	480	18.3	1,226	46.8	2,620

TABLE III-3
(continued)

Assuit	46		39		169		254
Districts	192		62		358		612
Villages	397		238		427		1,062
TOTAL	635	32.9	339	17.6	954	49.5	1,928
Sohag	34		47		180		261
Districts	176		69		340		585
Villages	575		353		476		1,404
TOTAL	785	34.9	469	20.8	996	44.3	2,250
Qena	34		46		166		246
Districts	159		71		345		575
Villages	396		219		402		1,007
TOTAL	589	32.0	336	18.3	913	49.7	1,838
Kafr El Sheikh	35		43		175		253
Districts	171		70		341		582
Villages	424		252		390		1,066
TOTAL	630	33.1	365	19.2	906	47.7	1,901
Fayoum	29		34		149		212
Districts	92		41		190		323
Villages	299		311		353		963
TOTAL	420	28.0	386	25.8	692	46.2	1,498
Kalubia	30		26		143		199
Districts	104		48		212		364
Villages	327		213		325		865
TOTAL	461	32.3	287	20.1	680	47.6	1,428
Giza	28		27		129		184
Districts	97		45		226		368
Villages	304		133		286		723
TOTAL	429	33.6	205	16.1	641	50.3	1,275
Beni Suef	32		26		116		174
Districts	104		45		248		397
Villages	328		148		289		765
TOTAL	464	34.7	219	16.4	653	48.9	1,336

TABLE III-3
(continued)

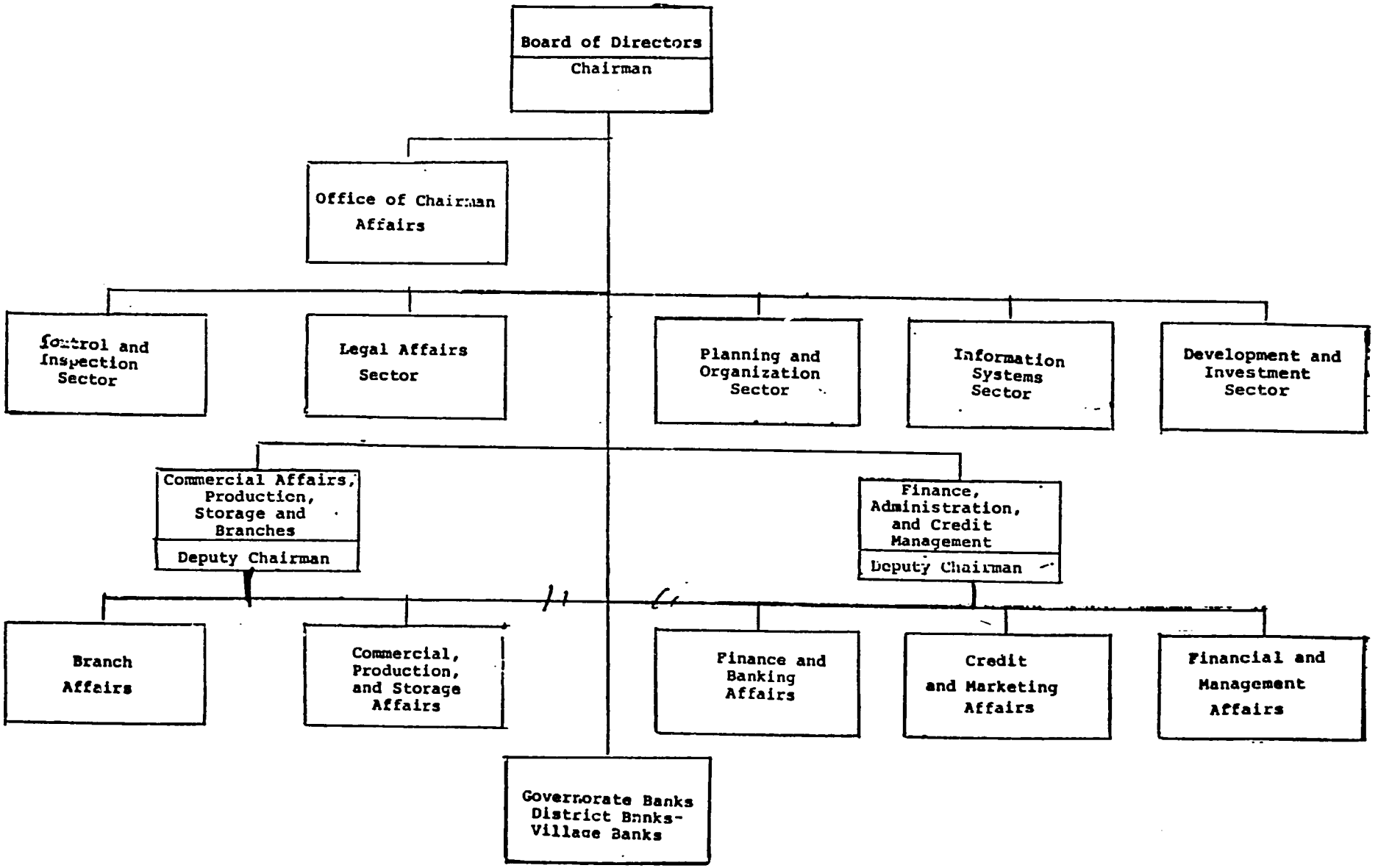
Aswan	13		12		68		93
Districts	39		16		88		143
Villages	133		62		163		258
TOTAL	185	31.1	90	15.2	319	53.7	594
Domietta	28		19		69		116
Districts	44		18		98		160
Villages	117		46		112		275
TOTAL	189	34.3	83	15.1	279	50.6	551
Ismailia	16		15		69		100
Districts	37		11		85		133
Villages	54		31		47		132
TOTAL	107	29.3	57	15.6	201	55.1	365
ALL GOVERNORATES & Subdivisions	11,227	36.0	6,318	20.3	13,597	43.7	31,142

Source: Planning and Organization Sector, PBDAC

Exhibit III-1

General Organization of the Principal Bank for Development and Agricultural Credit (PBDAC)

(1989)



Source: Adapted from charts of the Planning and Organization Sector, PBDAC.

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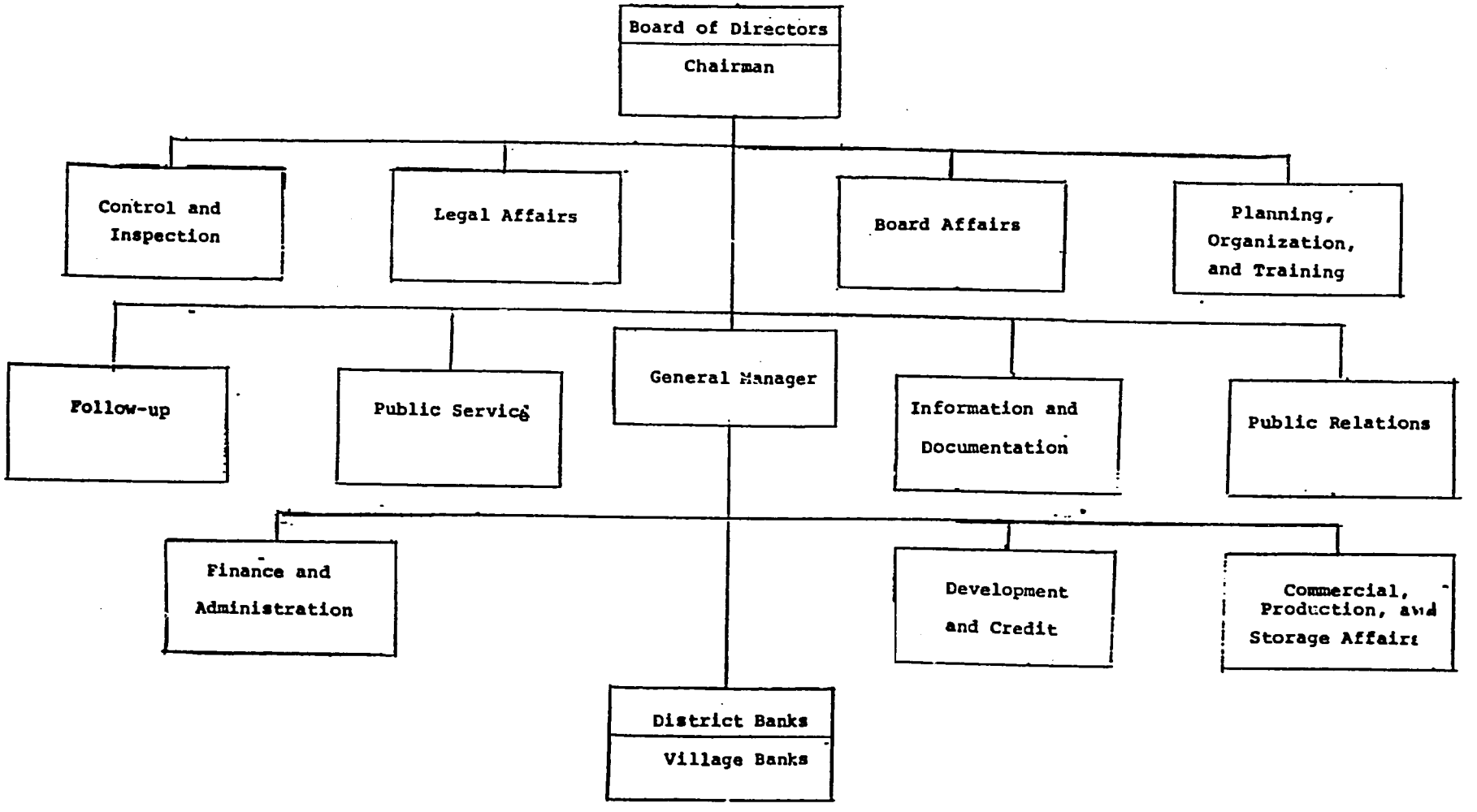
Exhibit III-2
Generalized Organization of Governorate Banks,
Development and Agricultural Credit (BDACs) (1989)

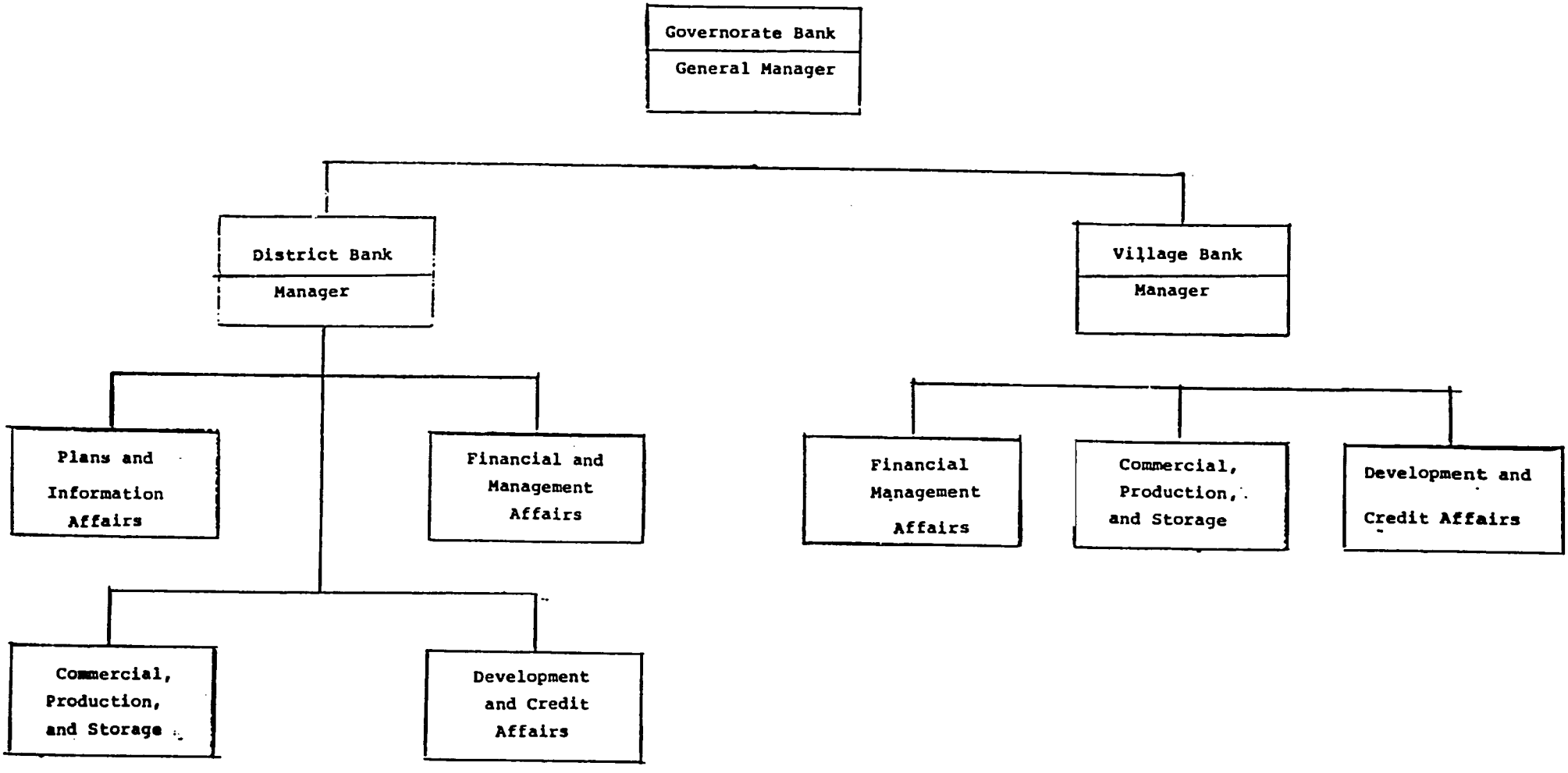


Source: Adapted from charts of the Planning and Organization Sector, PBDAC.

Exhibit III-3

Generalized organization of District and Village Banks

Governorate Banks of Development and Agricultural Credit (1989)



Source: Adapted from charts of the Planning and Organization Sector, PBDAC.

Exhibit III-4

Summary of Methods of Calculating Social Security Benefits

According to the Social Security Law, issued by Law No. 79 for the year 1975, the benefits accruing to the employees whose employment is terminated as a result of redundancy (so-called "cancellation of the jobs" under the law) consist of:

1. Monthly pension payment, provided that the redundant employee shall have subscribed to Social Security for 180 months at least. This monthly pension represents 1/45 of the average salary payments of the last two years, multiplied by the number of years of the period of his social security subscription, up to a maximum of 80 percent of the aforesaid average salary and a maximum, in every case, of L.E. 200. Salary, in this respect, means the basic salary and the variable or changeable salary, for which the employer has contributed to the Social Security. Variable or changeable salary means all payments made to the employee in excess of the basic salary. In particular, it consists of incentives, commissions, gratuities, overtime payments, compensation for unusual efforts, cost of living allowance, social allowance, additional social allowance, collective bonuses, and profit shares. The pension for the basic salary and that applicable to variable or changeable salary are to be calculated separately and the latter part shall not be subject to the aforementioned absolute maximum of L.E. 200.

   However,

   (a) if the employee has contributed to the social security for more than 36 years or more than the period required for the maximum pension (i.e., 80 percent of the last two years salary), he will be entitled to a so-called "once-off" lump sum compensation. This compensation consists of 15 percent of his annual salary for each year of the excessive period. In this respect the last salary means the monthly average for the last two years multiplied by 12.

   (b) If the employee is not entitled to the pension because his period of contribution is less than 180 months, he will also be paid a once-off lump sum compensation calculated at the rate provided for in (1) above.

2. In addition to the pension, the once-off compensation, or both as aforesaid, the employee entitled to those benefits will also be entitled to a bonus. This bonus is calculated at the rate of one-month salary for each year of contribution to the bonus system of the social security. The salary will be calculated at the rate provided in (1) above.

IV. PBDAC'S FINANCES

Overall Financial Situation of the PBDAC Group

General

4.1 The present section does not attempt to make a detailed analysis of PBDAC's financial performance, as this was not the objective of the present assignment, but only to comment on some of the most salient features revealed by a review of the financial statements of the PBDAC group for the period 1984/85 to 1987/88, with special attention to those features which may be relevant to PBDAC's future performance if its input activities are gradually curtailed and consequently its profitability will depend increasingly on its credit operations.

4.2 The consolidated balance sheets for the PBDAC group during the period 1984/85 to 1987/88 are shown in Table IV-1.

4.3 The following table shows the growth of PBDAC's income and expenses over the same period.

PBDAC'S INCOME AND EXPENSES (IN L.E. MILLIONS)

Year	1984/85	1985/86	1986/87	1987/88
Income from Activities, Net of Subsidy	235.092	302.331	386.069	442.387
Subsidy	61.689	74.603	82.326	91.518
Total Income from Activ.	296.781	376.934	468.395	533.905
Total Expenditures	200.628	266.036	344.871	399.356
(of which: Bab I Exp.)	(107.286)	(129.301)	(147.634)	(166.776)
Net Income from Activ.	96.153	110.898	123.524	134.549
Other Income	17.179	15.530	20.201	33.899
Total Net Income	113.332	126.428	143.725	168.448

4.4 The above table shows that over the period in question, PBDAC's total income from its banking and input distribution activities increased from L.E. 296.8 M to L.E. 533.9 M, i.e. by 80%. Total expenditures increased by 99%, from L.E. 200.6 M to L.E. 399.4 M. Because of this faster increase of expenditure than income, PBDAC's net operating income increased by only 40% over the same period.

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4.5 Of the total income, in 1984/85 the share of the banking operations was about 56% and that of the non-banking activities was 44%. By 1987/88, total income from the banking activities increased to 70% and that of the non-banking activities declined to 30%. However, the share of banking and non-banking activities in net income remained practically constant over the period.

4.6 There was a continuous decline in total net income as percentage of gross income - from about 38% in 1984/85 to about 32% in 1987/88.

Some Important Ratios of the PBDAC Group

4.7 The following table shows the development of some important ratios of PBDAC during the period in question.

PBDAC GROUP - SOME IMPORTANT RATIOS

Ratios	1983/ 1984	1984/ 1985	1985/ 1986	1986/ 1987	1987/ 1988
Med+Long Term Debt:Equity	3.46	4.32	6.39	8.20	8.79
Liquidity Ratio	0.003	0.03	0.02	0.11	0.06
Total Loans:Deposits	1.78	1.90	2.25	2.38	2.24
Subsidy:Total Credit Income	n.a.	36.93%	33.49%	27.32%	26.42%
Subsidy:Net Credit Income	n.a.	128.13%	122.53%	131.29%	130.16%
Provisions other than Depreciation:Loans	n.a.	0.91%	1.03%	1.46%	1.94%
Net Income Minus Subsidy: Total Assets	n.a.	3.01%	2.08%	1.82%	1.84%
Net Income Minus Subsidy: Equity	n.a.	45.42%	38.78%	39.68%	45.18%
Net Income Minus Subsidy: Bab I (Personnel) Costs	n.a.	48.13%	40.08%	41.59%	46.13%
Net Income Minus Subsidy: Total Inc. Minus Subs.	n.a.	14.66%	12.01%	10.67%	9.73%

The interpretation of these ratios is discussed below.

4.8 **Ratio of Medium + Long Term Debt to Equity**: The development of this ratio is shown in the following table.

RATIO OF MEDIUM AND LONG TERM DEBT TO EQUITY (L.E. MILLION)

Year	83/84	84/85	85/86	86/87	87/88
Med + LT Debt	342.1	490.8	853.9	1,268.3	1,496.2
Equity	98.8	113.7	133.6	154.8	170.3
Ratio	3.46	4.32	6.39	8.20	8.79

4.9 The above figures show that over the past five years PBDAC's medium and long-term debts have increased by 337.4%; however, this was not matched by a proportional increase in PBDAC's equity, which increased by only 72.3%. This caused the debt-to-equity ratio to increase over the period by 154%, from 3.46 to 8.79.

4.10 Although the latter ratio is still within acceptable limits, it is suggested to monitor it more closely, especially in view of the fact that different components of the medium and long-term debts have increased at extremely different paces: advances from commercial banks increased by 383%, foreign loans surged by 642% (partially because of deterioration of the exchange rate), while local loans other than from commercial banks increased by only 6%.

4.11 **Cash Liquidity Ratio**: This ratio, which indicates PBDAC's ability to meet any short-time rush of withdrawals on customers' current and savings accounts, has improved substantially over the period 1983/84 to 1986/87, but dropped again in 1987/88, as shown in the following table:

CASH LIQUIDITY RATIO (L.E. MILLION)

Year	83/84	84/85	85/86	86/87	87/88
Cash & Banks	1.1	9.3	8.8	64.2	39.0
Current & Sav. A/C	294.5	348.9	433.5	584.1	670.5
Ratio	0.004	0.03	0.02	0.11	0.06

4.12 The ratio is still for below secure limits and needs to be further investigated and monitored.

4.13 **Ratio of Total Loans to Deposits**: This ratio has kept within acceptable norms, as shown in the following table.

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RATIO OF TOTAL LOANS TO DEPOSITS

Year	83/84	84/85	85/86	86/87	87/88
Seasonal Loans	232.2	230.0	326.7	422.5	568.9
Term Loans	608.8	863.9	1265.6	1728.9	1792.4
Total Loans	841.0	1093.9	1592.3	2151.4	2361.3
Cur.& Sav.A/C	294.5	348.9	433.5	584.1	670.5
Term Deposits	179.3	225.9	273.4	321.1	381.9
Total Deposits	473.8	574.8	706.9	905.2	1052.4
Ratio	1.78	1.90	2.25	2.38	2.24

4.14 **Ratio of Subsidy to Total Credit Income**: This ratio indicates the part of subsidy paid to PBDAC by the GOE in total income from credit operations. During the last four years this ratio has developed as follows:

RATIO OF CREDIT SUBSIDY TO TOTAL CREDIT INCOME (L.E. MILLION)

Year	84/85	85/86	86/87	87/88	% Increase
Ag. Credit Income	58.7	75.6	88.8	108.5	84.6%
Inv. Credit Income	108.3	149.2	212.6	237.9	119.7%
Total Cred. Income	167.1	224.8	301.4	346.5	107.4%
Of which: Subsidy	61.7	74.6	82.6	91.5	48.3%
Ratio	36.93%	33.49%	27.32%	26.42%	(28.46%)

4.15 The above series indicates that the annual amount of subsidies received by PBDAC (in absolute terms) has increased by 48% over the period in question. However, total credit income has increased by 107%, so that the part of subsidy in total credit revenue dropped from 36.9% to 26.4% - a positive development.

4.16 **Ratio of Credit Subsidy to Net Credit Income**: The development of this ratio over the past four years shows to what extent PBDAC's profits from the credit operation depend on the subsidy. To review this ratio it is necessary to compare PBDAC's gross profits from its credit operations (above) to the expenses of its credit operation, shown in the following table.

RATIO OF CREDIT SUBSIDY TO NET CREDIT INCOME (L.E. MILLION)

Year	84/85	85/86	86/87	87/88	% Increase
Credit Expenses:					
Agric. Credit	48.5	53.8	66.2	81.3	67.6%
Invest. Credit	70.4	108.1	172.5	194.8	176.7%
Total Cred. Exp.	118.9	161.9	238.7	276.1	132.2%
Net Credit Income:					
Agric. Credit	10.2	19.8	22.6	27.2	165.2%
Invest. Credit	37.9	41.1	40.1	43.2	13.9%
Net Credit Inc.	48.1	60.9	62.7	70.3	46.1%
Subsidy	61.7	74.6	82.6	91.5	48.3%
Ratio	1.28	1.22	1.31	1.30	1.6%

4.17 This table indicates that although PBDAC's credit income increased by 107% over the period in question, credit-related expenditures have increased faster (by 132%), so that net income from credit operations increased by only 46% - very close to the increase in subsidy (48%); so that the ratio between subsidy and net credit income increased slightly. Looking at the ratio inversely, net credit income covered in 1987/88 only 77% of the subsidy, so the total credit operation showed a net operating deficit of L.E. 21.2 million.

4.18 **Ratio of Provisions to Loans**: The table in Par. 4.7 shows that the ratio of provisions (other than depreciation) to loans has more than doubled over the past four years. It increased from 0.91% in 1984/85 to 1.94% in 1987/88.

4.19 Due to time limitations, components of these provisions could not be analyzed in detail. However, the ratio of 1.94% is quite low. This is especially true in the case of PBDAC, since a significant part of its loan portfolio is tied in the poultry industry.

4.20 **Ratio of Net Income Minus Subsidy to Total Assets**: This ratio, which reflects PBDAC's profitability better than the net-income-to-assets ratio, dropped from 3.01% in 1984/85 to 1.82% in 1986/87, although it recovered slightly to 1.84% in 1987/88. This significant reduction in profitability merits an investigation of its causes.

4.21 **Ratio of Net Income Minus Subsidy to Equity**: This ratio, which amounted to 45.42% in 1984/85, dropped in the two following years but recovered in 1987/88 to 45.18%. This ratio is high for a development bank, reflecting PBDAC's highly leveraged position, in which small profits on total assets translate into large profits on equity.

4.22 **Ratio of Net Income Minus Subsidy to Bab I Expenses**: To obtain a meaningful indication of the profitability of PBDAC's work force, one should divide the net income from PBDAC's activities (total income less income carryover from previous years and other non-activity income, less subsidy, less expenses) by Bab I (personnel) costs. The results are as follows:

RATIO OF UNSUBSIDIZED NET INCOME TO PERSONNEL COSTS (L.E. MILLION)

Year	84/85	85/86	86/87	87/88	% Increase
Total Inc. from Activ. (w/o Subs.)	235.1	302.3	386.1	442.4	88.18%
Total Expenses	200.6	266.0	344.9	399.4	99.05%
Net Inc. w/o Subsidy	34.5	36.3	41.2	43.0	24.85%
Bab I Costs	107.3	129.3	147.6	166.8	55.32%
Net Inc. w/o Subsidy: Bab I Costs	32.1%	28.1%	27.9%	25.8%	(19.6%)

4.23 It is clear from above table that personnel expenses were allowed to increase by 55.3% over the period 1984/85 to 1987/88, while net income minus subsidies increased by only 24.8%. The bottom line of the table points out a worrysome steady decrease of the profitability of the work force.

4.24 **Ratio of Net Income Without Subsidy to Total Income Without Subsidy**: Much of the foregoing can be summarized by the ratio of PBDAC's net income from its activities to its total income, in both cases leaving out the subsidy. This represents fairly accurately the profitability of PBDAC's own efforts during a given year. As shown in the table below, this ratio has steadily deteriorated from 14.66% in 1984/85 to 9.73% in 1987/88.

RATIO OF UNSUBSIDIZED NET TO UNSUBSIDIZED TOTAL INCOME (L.E.M)

Year	1984/85	1985/86	1986/87	1987/88
Income from Activities, Net of Subsidy	235.092	302.331	386.069	442.387
Net Income from Activ., Net of Subsidy	34.464	36.295	41.198	43.031
Ratio	14.66%	12.01%	10.67%	9.73%

Financial Position of the Governorate Banks

4.25 A brief review of the 17 Governorate Banks of Development and Agricultural Credit (BDACs) was undertaken to identify those with exceptionally high or low profit margins. Due to the unavailability of data for former years, the analysis was based on the financial statements of 1987/88, which in 15 of the BDACs contained also information for 1986/87. Thus the information does not give a long-term view of the performance of the BDACs, but only their relative position in the last one or two years.

4.26 Table IV-2 shows the net profit, total turnover (defined as new loans extended during the year), total assets, total equity and capital of each BDAC. These figures are used in Table V-3 to show the return on turnover, assets and equity. (Since the capital of these banks forms such a small part of their liabilities, return on capital is not very meaningful.) Table IV-3 also ranks the BDACs from best to poorest in terms of their return on turnover, assets and equity.

4.27 The three ratios should not be given the same weight; return on turnover, followed by return on assets, seem to be for BDACs a better indicator of efficient performance than return on equity.

4.28 Nevertheless, it is remarkable that on all three counts and in both years of the record, Kafr El Sheikh clearly came in first place. Moreover, the performance of Kafr El Sheikh BDAC improve in 1987/88 and was over twice the average for all BDACs.

4.29 The BDAC of Qena was the second best performer on two counts out of three in 1986/87, and on all three counts in 1987/88.

4.30 Behind these two BDACs there were no other clear winners. On the low end of the scale, Sohag took last place on all counts in both years, and Menufiya was next to last. Ismailiya did almost as poorly as Menufiya in 1986/87, but improved to about average performance in 1987/88.

4.31 It is noteworthy that BDACs like Qena and Sohag, serving

neighboring governorates which have similar agricultural characteristics, have such a radically different financial performance. This indicates that there may be differences in BDAC management, portfolio composition or particular local circumstances which merit closer investigation. Likewise, the superior performance of Kafr El Sheikh and Qena could be studied to identify "secrets of success" which might be applicable to other BDACs.

PBDAC's Banking Operations

General

4.32 PBDAC's activities comprise two major areas: banking and commercial operations. Banking operations consist of (i) agricultural production credits, (ii) investment credits and (iii) banking transactions. These operations are the subject of the present section.

4.33 In addition, PBDAC manages nine commercial operations, i.e. sale of (i) fertilizers, (ii) seeds, (iii) pesticides, (iv) feed, (v) spare parts and sprayers, (vi) new jute bags; as well as (vii) supply (purchase of agricultural products for the Ministry of Supply), (vii) commercial operations (sale of agricultural machinery and equipment) and (ix) fumigation of warehouses for PBDAC and others. These commercial operations are discussed in the following section.

Structure of PBDAC's Loan Portfolio

4.34 Information from PBDAC's balance sheets (Table IV-4) shows that in the period 1984/85 to 1987/88 medium-term investment loans (loans of over 12 months, and generally 5 to 7 years) constituted 75% to 80% of PBDAC's credit portfolio, compared with 20% to 25% of the portfolio consisting of short-term agricultural production loans (of less than 12 months, and generally 5 to 7 months). Thus the ratio of medium to short-term loans, as reported in PBDAC's balance sheets, was between 3:1 and 4:1, commonly considered a satisfactory ratio for a development bank.

4.35 Table IV-5, however, sheds a different light on the subject. This table shows that a large proportion of the investment loan portfolio consists of short-term credit associated with the investment projects (e.g. for purchase of animal feed, chicks, etc.). Furthermore, Table IV-5 shows that the proportion of short-term loans in the investment loan portfolio has been constantly on the increase - from about 30% on 6/30/85 to nearly 40% on 6/30/88.

4.36 The totals of Table IV-5, which were obtained from PBDAC's

Loan Collection Department, are by their nature not as accurate as those of Table IV-4, which originate from PBDAC's audited balance sheets. However, the variation averaged 2% and was in no case over 3.4%. Thus the figures are close enough for purposes of the present comparison. Combining the figures from the two sources gives the following picture:

STRUCTURE OF PBDAC'S LOAN PORTFOLIO (IN L.E. MILLIONS)

Date	6/30/85	6/30/86	6/30/87	6/30/88
Medium-term inv. loans	571.2	813.1	1090.3	1032.8
Short-term inv. loans	248.8	383.3	529.4	679.6
Total investment loans	820.0	1196.4	1627.7	1712.4
Short-term inv. loans as % of total inv. loans	30.3%	32.0%	32.5%	39.7%
Short-term prod. loans	230.0	326.7	422.5	568.9
Total short-term loans	478.8	710.0	951.9	1248.5
Total loans	1050.0	1523.1	2050.2	2281.3
All short-term loans as % of all loans	45.6%	46.6%	46.4%	54.7%

4.37 The above table shows that short-term investment loans exceeded the short-term production loans in all cases. taken together, short-term loans increased from 45.6% of PBDAC's portfolio in 1985 to 54.7% in 1988.

4.38 The fact that the portfolio composition tilts towards short-term loans is by no means considered a detriment. PBDAC is the only bank in Egypt which caters to small farmers, so that its loan mix should satisfy the credit demands of this clientele, which may well be more oriented to short-term loans. From a banking point of view, the recent shift to more short-term lending makes sense in view of the excellent repayment record of production loans and the doubtful prospects of many investment loans (especially in the poultry sector), discussed below.

Direct and Indirect PBDAC Costs

4.39 PBDAC has a cost accounting system which allows its income and expense items to be posted to one of its twelve activities enumerated in Par. 4.32-4.33. This is done in two steps:

- First, in each BDAC all income and direct costs of any activity are posted to that activity. In case of employees who spend parts of their time on different activities (e.g.

credit, fertilizer distribution, etc.), their salaries and other costs (e.g. cash and in-kind benefits, bonuses, allowances and pension) are allocated among these activities according to the time spent on each.

- Second, all remaining costs which cannot be directly imputed to any one activity (e.g. salaries of PBDAC's top management, legal and accounting staff, etc.) are allocated among the twelve activities in the same proportion as total direct costs.

4.40 This procedure seems to allocate costs among the different activities reasonably well. In particular, the allocation procedure does not seem to create a bias for or against any activity. Furthermore, the criteria are consistent from year to year, so that valid inter-year income and cost comparisons of different items can be made.

4.41 The financial analysis of PBDAC's activities is based principally on the "consolidated statements of income and expense" reports for PBDAC's twelve activities for the fiscal years 1985/86, 1986/87 and 1987/88 (referred to as 1986, 1987 and 1988 respectively). These tables constitute Annex D. The tables show for each activity:

- total income, expenditure and net inccome;

- the elements of expenditure (personnel, goods, services, etc.); and

- the elements of income (interest, commission, subsidy, etc.).

Agricultural Production Credit

4.42 **Quality of the Production Credit Portfolio**: PBDAC's operations in short-term agricultural credit (production credit) are shown in Table IV-6. The table indicates that in calendar year 1987, PBDAC extended L.E. 590 M in credits due in 1987 and L.E. 263 M in credits not due until 1988 (some of the latter were credits recovered in 1987 and rolled over).

4.43 The table shows that total production credits due in 1987 amounted to L.E. 624 M, of which L.E. 620 M (99.32%) were recovered. Furthermore, Table IV-7 shows that the percentage of recovery on production loans has been gradually improving, from 97.67% in 1982 to 99.32% in 1987.

4.44 Equally important in considering recovery performance is the fact that PBDAC's entire portfolio of credits extended prior to 1987 (classified as "installments on old debts" and "credits in arrears") amounted on 1/1/87 to only L.E. 7.6 M (Table IV-6).

Furthermore, 34% of the pre-1987 loans were recovered during 1987, so that on 12/31/87 outstanding pre-1987 credits amounted to only L.E. 5.0 M, i.e. only 0.85% of the amount of production loans extended and due in 1987. Thus the total amount of older production loans in the portfolio is insignificant, and even of this minor amount a considerable portion (on the order of 50%, i.e. L.E. 2.5 M) is expected by PBDAC to be recovered.

4.45 In this connection it is important to note that the "provisions other than depreciation" item for agricultural production loans has increased from L.E. 1.7 M in 1986 to L.E. 3.95 M in 1987 and again to L.E. 4.8 M in 1988. According to PBDAC, over 85% of these provisions (L.E. 4.1 M) constitute provisions for bad debts; this amount seems quite sufficient to take care of any bad debts on production credits.

4.46 Thus PBDAC's performance in recovery of production credits has been very strong and constantly improving. This outstanding performance can be ascribed at least in part to PBDAC's control of agricultural inputs (particularly its quasi-total control of fertilizer at official prices), since the farmers know that they must be current with PBDAC to be able to obtain inputs at subsidized prices.

4.47 Traditionally PBDAC's production credits were subsidized, at an interest rate of 4% per season. Recently there has been a strong trend toward unsubsidized production credit, offered at 13% interest per season plus 1% service charge, as discussed below.

4.48 **Income and Expenses for Production Credit**: Tables D-1 to D-3 of Annex D show PBDAC's income and expenses for agricultural production credit for the period 1986-1988. These tables can be summed as follows:

PRODUCTION CREDIT - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Interest +Commis.	Subsidy	Total Income	Expenses	Net Income	Net Income: Total Income
1986	20.283	53.299	73.582	53.819	19.763	0.27
1987	28.649	60.126	88.775	66.159	22.616	0.25
1988	40.266	68.212	108.478	81.317	27.161	0.25

4.49 The above figures indicate that between 1986 and 1988, income from production credit (including GOE subsidies for this activity) experienced a considerable expansion amounting to L.E. 34.896 M (47%), but costs grew by L.E. 27.498 M (51%), so that net income increased by L.E. 7.398 and its share in gross income declined from 0.27 to 0.25.

4.50 On the income side, interest and other income on loan

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activity increased between 1986 and 1988 by L.E. 19.983 M (99%), while the interest subsidy increased by L.E. 14.913 M (28%). This development caused the share of subsidy in the total net income from production credit to decrease from 72% to 63%.

4.51 The larger increase in interest income relative to subsidy is explained by the faster growth of unsubsidized loans in the production credit portfolio. Table IV-8 shows that between 1985/86 and 1986/87 unsubsidized production loans increased by 126%, while subsidized production loans increased by only 27%. For 1987/88, figures are available only for the summer and sugarcane credits; these figures indicate that unsubsidized loans grew by 366% over summer and sugarcane credits of 1985/86, while subsidized loans grew by only 43%. As a result, the unsubsidized portion of the production credit portfolio grew from 13% in 1985/86 to 23% in 1986/87. For winter and sugarcane credits, the unsubsidized portion of the portfolio increased from 8% in 1985/86 to 22% in 1987/88.

4.52 As to costs, the major increases between 1986 and 1988 were in interest and financing expenses (L.E. 14.982 M or 87%), personnel expenses (L.E. 8.316 M or 25%), and provisions other than depreciation (L.E. 3.050 M or 174%).

Investment Credit

4.53 **Nature of the Investment Credit Portfolio**: PBDAC's largest single activity is the provision of investment credits. These comprise livestock, poultry and fishery projects, machinery loans, land reclamation, orchard planting, consumer durables and others. Conditions on these loans are typically as follows:

CONDITIONS ON INVESTMENT LOANS

Type of Loan	Interest	Total Duration	Grace Period
Land reclamation	6%	15 years	4 years
Planting soil-improving crops	6%	7	2-3 "
Irrigation systems	6%	7	2-3 "

Livestock and poultry (unsubsidized):

Less than 1 year	13%
1-2 years	14%
over 2 years	15%

Subsidized loans (fisheries, ag. industries, livestock in New Lands only) 9%

4.54 For importers of agricultural inputs, and for certain activities such as mechanization and foliar fertilizers, PBDAC extends credit at the unsubsidized commercial rate of 16%. Formerly, other "food security" credits (livestock, poultry), mechanization credits, etc. were also subject to subsidized credit, at 6% to 8% interest. A 1% commission is added to the above interest rates.

4.55 Table IV-9 shows that on 7/1/87 PBDAC's investment credits outstanding totalled L.E. 1,628 M, and another L.E. 1,448 M were extended during 87/88 while L.E. 1,364 were recovered, so that investment credits outstanding on 6/30/88 totalled L.E. 1,712 M.

The development of the investment credit portfolio is shown in the following table:

STRUCTURE OF THE INVESTMENT CREDIT PORTFOLIO (IN L.E. MILLION)

Date	6/30/85	6/30/86	6/30/87	6/30/88
Short-term loans				
Livestock	90.8	304.8	456.6	585.0
Poultry	42.6	55.5	61.8	69.9
Others	15.4	23.2	22.1	24.7
Total, short-term loans	248.8	383.3	540.5	679.6
Medium-term loans				
Livestock	248.3	373.3	488.1	360.3
Poultry	92.7	90.0	103.0	99.0
Ag. mechanization	111.1	173.2	274.8	314.2
Land reclamation	4.0	7.9	13.5	14.6
Fisheries	2.1	1.8	2.4	2.4
Orchards	3.5	7.8	6.6	7.4
Consumer durables	18.0	18.8	17.9	12.7
Others	91.4	140.4	192.4	222.2
Total, medium-term loans	571.2	813.0	1087.6	1032.8
Total, investment loans	820.0	1196.5	1628.1	1712.3

4.56 The above table points out the preponderance of livestock loans, which for both short and medium-term components constituted 59.4% of the investment loan portfolio in 1985 and 55.2% in 1988. Poultry loans (short and medium-term) decreased over the same period from 16.5% to 9.9% of the portfolio, and machinery loans increased from 13.5% to 18.3%. Land reclamation, fisheries and orchards constituted individually less than 1% of the portfolio.

4.57 **Repayment Performance**: The following table shows the

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repayment performance of the investment credit portfolio by type of loan.

REPAYMENT RATES BY TYPE OF LOAN (IN %)

Type of Loan	1985/86	1986/87	1987/88
Short-term loans:			
Livestock	95.70%	96.31%	95.59%
Poultry	95.02%	95.65%	92.78%
Others	93.00%	93.05%	88.26%
Total, ST loans	95.44%	96.10%	94.98%
Medium-term loans:			
Livestock	89.11%	91.54%	90.31%
Poultry	82.53%	79.24%	64.53%
Mechanization	94.77%	95.45%	94.48%
Land reclamation	90.10%	76.13%	90.71%
Fisheries	80.59%	72.36%	78.43%
Orchards	93.02%	93.14%	75.14%
Consumer durables	89.39%	87.54%	89.71%
Others	86.51%	87.46%	83.77%
Total, MT loans	88.39%	89.25%	86.57%
Total, devel. loans	92.87%	93.69%	92.02%

4.58 The above table indicates that the short-term components of development loans have performed considerably better than the long-term components (overall repayment of 94.98% vs. 86.57%). Among the medium-term loans, the poorest repayment was in the poultry sector, which reflects the current difficulties of this sector. The orchards, fisheries and "others" sectors have also had lower-than-average repayment rates.

4.59 In considering the above figures it is important to keep in mind that the true situation of the medium-term investment portfolio may be considerably worse than these figures indicate, since many of these loans have been rescheduled. Rescheduling of livestock and poultry loans started in 1985, due to the repayment difficulties many borrowers were experiencing. In 1985 loans totalling L.E. 39.6 M were rescheduled, of which L.E. 24.9 M was in poultry loans and L.E. 14.7 M in livestock loans. The amount of investment loans rescheduled in 1986, 1987 and 1988 could not be ascertained since authority for such rescheduling has been given to the BDACs and, remarkably, the mission was advised that the Principal Bank does not monitor this important aspect. PBDAC's management stated, however, that in the event of default PBDAC

would not lose since these loans are adequately covered by collateral.

4.60 A breakdown of loans among individual and cooperative borrowers, as well as among subsidized and unsubsidized loans, is shown in the following table.

BREAKDOWN OF REPAYMENT RATES (IN %)

	Subsidized Loans			Unsubsid. Loans			Total Loans		
Year	Ind.	Co-op	Total	Ind.	Co-op	Total	Ind .	Co-op	Total
85/86	n/a	n/a	n/a	n/a	n/a	n/a	93.66	76.80	92.87
86/87	87.59	68.28	86.69	94.63	94.50	94.63	93.81	90.01	93.69
87/88	87.61	49.33	86.24	92.93	86.98	92.76	92.33	81.69	92.02

4.61 The above figures show that individual borrowers have a considerably better repayment performance than cooperatives (92% vs. 82% in 1987/88). The repayment rate of cooperatives has markedly deteriorated from 86/87 to 87/88, especially for subsidized loans, with an overall reduction of 8.32 percentage points, while for individuals repayment it declined by only 1.48 points.

4.62 Equally interesting is the observation that for both 86/87 and 87/88, in the case of both individuals and cooperatives, the repayment rate on unsubsidized loans was considerably higher than on subsidized loans - by 7.94 percentage points in 1986/87 and 6.52 points in 1987/88.

4.63 **Income and Expenses for Investment Credits**: PBDAC's income and expenses for investment credits for the period 1986-1988 are shown in Tables D-4 to D-6. These tables can be summarized as follows:

INVESTMENT CREDIT - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Interest +Commis.	Subsidy	Total Income	Expenses	Net Income	Net Income: Total Income
1986	129.040	20.149	149.189	108.064	41.125	0.28
1987	192.154	20.439	212.593	172.503	40.090	0.19
1988	218.701	19.274	237.975	194.802	43.173	0.18

4.64 The above table shows that between 1986 and 1988 total income from investment credits has increased considerably, by L.E. 88.7 (60%). The increase came entirely from augmented commissions and other charges, since interest rate subsidy (for food security projects such as poultry) actually decreased slightly over the period.

4.65 At the same time, expenses increased almost as much, by L.E. 86.7 M (80%). Consequently, net income from investment credits increased only slightly (by L.E. 2.0 M or 5%), while the part of net income in total income dropped substantially, from 0.28 to 0.18.

4.66 The main cost increases were in:

(a) direct financing expenses, which augmented by L.E. 48.1 M or 80%;

(c) provisions other than depreciation, which increased by L.E. 23.6 M (more than tripled from 1986 to 1988); and

(b) personnel expenses (both direct and indirect), which increased by L.E. 16.6 M or 57%.

Banking Transactions

4.67 The income of PBDAC's banking transactions activities results mainly from:

(a) opening letters of credit in commercial banks for importing fertilizers, machinery, pesticides, jute bags, etc., in which case PBDAC gets back from the commercial bank one-half of the commission;

(b) letters of credit for import opened by PBDAC, in which case PBDAC takes all of the commission;

(c) banking services for other parties (e.g. check cashing and collection, issuing letters of guarantee), for which PBDAC receives the corresponding fees;

(d) maintaining interest-free current accounts for farmers and for GOE entities, in which case the banking transactions department charges a 9% "assumed interest" for on-lending these funds to PBDAC's other departments; and

(e) the spread between the interest paid to PBDAC's time and savings accounts (amounting to 5%-13% according to the type of account), and the 9% "assumed interest" charged for on-lending these funds to PBDAC's other departments.

4.68 The following table (based on Tables D-7 to D-9) shows that PBDAC's income and expenses from banking transactions for the last three years were:

BANKING TRANSACTIONS - INCOME AND EXPENSES (L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	19.972	16.708	3.264	0.16
1987	21.932	16.125	5.807	0.26
1988	27.238	18.251	8.986	0.33

4.69 The above figures show that during the period 1986-1988, PBDAC's income from banking transactions increased by L.E. 7.2 M (36%), while expenses increased by only L.E. 1.5 M. In consequence, net income from the activity increased by L.E. 5.7 M, and its share in total income more than doubled, from 0.16 to 0.33.

4.70 The increase in costs was mainly due to a rise of L.E. 2.28 M (34%) in direct personnel expenses, and to a very large increase (L.E. 1.41 M) in provisions other than depreciation. The increased personnel costs were due almost entirely to more personnel being engaged in the activity rather than to higher personnel unit costs, as evidenced by the fact that indirect personnel costs stayed practically constant. The above cost augmentations were partially compensated by a large reduction of L.E. 2.454 M (33%) in direct financing expenses.

PBDAC's Non-Banking Operations

General

4.71 PBDAC's non-banking operations comprise nine activities:

(a) fertilizer (distribution to farmers);

(b) seed (distribution to farmers);

(c) pesticide (distribution to farmers and to MOI's cotton spraying operations);

(d) feed (distribution of raw materials to feed mills and of prepared feed to end users);

(e) spare parts and sprayers (distribution to MOA and to farmers);

(f) new jute bags (distribution to farmers, PBDAC's own use, and GOE);

(g) supply (purchase of products from farmers at guaranteed floor prices on behalf of the Ministry of Supply);

(h) commercial operations (sale of agricultural machinery, equipment, foliar fertilizers, vegetable seeds, etc.); and

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(i) fumigation (of PBDAC's own warehouses, and service to others).

4.72 For each of these activities, the present section analyzes the following financial charactieristics:

- the trend of total income, expenses, net income and its share in total income between 1986 and 1988;

- the principal items responsible for the growth in income and expenses; and

- the effect that divestiture of the activity would have in the short term on PBDAC's profit-and-loss situation.

4.73 Calculation of the negative effect of divestiture on PBDAC's finances was based on the following considerations:

- If an activity were to be divested, the entire income from the activity (which is based principally on commissions) would disappear.

- In the short term, all direct and indirect personnel costs (Bab I) attributable to the activity are assumed to remain, until the personnel concerned could be deployed in other PBDAC activities (e.g. increased credit operations), retrained for non-PBDAC employment, or taken care of through natural or accelerated retirement.

- The "goods" category (Bab II.A) consists of items which are mostly directly related to personnel (e.g. fuel, supplies, stationery, water and electricity); in the short term, these items were assumed to remain.

- Depreciation charges and property taxes on facilities related to the activity (e.g. warehouses) were assumed to remain until such facilities were disposed of.

- All other costs concerned with the activity were assumed to be eliminated. In particular, since PBDAC would not be handling the product or service in question, its interest and financing expenses (which normally constitute the largest cost item beside salaries) would disappear.

4.74 Thus the financial effect on PBDAC of divestiture of an activity could be expressed by the formula:

(annual loss) = (net income of the activity)+(Bab I costs)+(Bab II.A costs)+(depreciation)+(property taxes)

4.75 The major assumption in this analysis is that <u>elimination of any PBDAC input activity will have no net effect on PBDAC's credit</u>

operations. This assumes that the farmers will receive from PBDAC cash credit for purchasing the inputs equal to the in-kind credit received previously; or that the farmers will acquire the input from suppliers partially on credit, and the suppliers will borrow from PBDAC the amounts necessary to offer the farmers such credit.

4.76 Annex E discusses the use or cash vs. in-kind credit in different input activities. It concludes that the animal feed, jute bags and fumigation activities are performed at present on cash basis, and therefore their divestiture will have no effect on PBDAC's credit operations. On the other hand, fertilizers, seeds, pesticides and spare parts are provided to the farmers in 80% to 100% of the cases as in-kind credit. Thus divestiture of these activities will need careful planning and monitoring of the shift from the present in-kind credt to cash credit.

Fertilizers

4.77 Sale of fertilizers is by far PBDAC's largest input activity. PBDAC's income and expenses for fertilizer distribution in 1986-1988 (Tables D-10 to D-12) were:

FERTILIZER DISTRIBUTION - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	53.522	33.198	20.324	0.38
1987	54.634	33.784	20.850	0.38
1988	61.924	39.889	22.035	0.36

4.78 The above numbers show that between 1986 and 1988 total income from fertilizer sales increased by L.E. 8.4 M (16%), expenses by L.E. 6.49 M (19%), and net income by L.E. 1.7 M (8%), so that the part of net in total income dropped by about 6%. Practically all the increases occured between 1987 and 1988.

4.79 The increase in fertilizer income was mainly due to higher income from commissions (L.E. 7.3 M). The increase in expenses was due mainly to augmented direct personnel costs (L.E. 4.2 M), in interest and financing costs (L.E. 2.776 M), and depreciation plus other provisions (L.E. 0.6 M). Interestingly, indirect personnel expenses actually decreased by L.E. 1.2 M over the period.

4.80 If PBDAC were to divest itself of fertilizer distribution, the income from this activity would disappear. On the other hand, it may be assumed that the personnel, goods, depreciation and property taxes costs would remain in the short term. Therefore, the initial annual loss to PBDAC from discontinuation of the fertilizer distribution activity, in comparison with 1988, comes out to precisely L.E. 50 million.

Seeds

4.81 PBDAC distributes various seeds, mostly as part of its in-kind production credit. The figures in this section refer only to field crop seeds, as imported vegetable seeds are handled separately and are accounted for under "commercial operations" (Par. 4.104). PBDAC's income and expenses in 1986-1988 from distribution of field crop seeds (Tables D-13 to D-15) were as follows:

SEED DISTRIBUTION - INCOME AND EXPENSES (IN L.E. MILLION)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	2.903	3.693	(0.790)	(0.27)
1987	3.927	3.860	0.067	0.02
1988	5.138	4.854	0.284	0.06

4.82 The above figures show that between 1986 and 1988 PBDAC's income from seed distribution increased by L.E. 2.2 M while costs of seed distribution increased by L.E. 1.2 M, so that the activity changed from a loss of L.E. 0.79 M to a modest net income of L.E. 0.28 M. Most of the cost increases were in direct personnel expenses (L.E. 0.551 M) and in financing costs (L.E. 0.440 M).

4.83 If PBDAC were to divest itself of seed distribution, income from this activity would disappear. If all costs except personnel, goods, depreciation and property taxes would also be eliminated, in the short term PBDAC's overall net income will deteriorate by L.E. 3.9 M.

Pesticides

4.84 PBDAC's Inputs Division distributes numerous types of pesticides. PBDAC's income and expenses for this activity in the last three years (Tables D-16 to D-18) were:

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PESTICIDE DISTRIBUTION - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	16.285	11.516	4.769	0.29
1987	18.789	12.107	6.682	0.36
1988	21.590	15.988	5.602	0.26

4.85 The above figures show a steady increase in total income from pesticide distribution amounting to L.E. 5.3 M (33%) over the last three years, coupled with a proportionately higher increase of about L.E. 4.5 M (39%) in expenses, so that the share of net in total income dropped by about 10%.

4.86 The main income increases were in pesticide commissions (L.E. 3.0 M), compensation from MOA for interest charges on pesticides stored over one year (L.E. 1.8 M) and picking up the 5% discount earmarked for cooperatives through increased distribution by the BDACs themselves (L.E. 0.4 M). The main increases in expenses were in financing costs (L.E. 2.5 M), in direct personnel costs (L.E. 1.4 M) and in depreciation and other provisions (L.E. 0.4 M). It is noteworthy that the indirect personnel costs stayed practically constant over the period. This indicates that the increase of 20% in direct personnel costs was due to increased numbers of personnel engaged in pesticide distribution, rather than to increased costs per employee.

4.87 If PBDAC were divested of the pesticide distribution function, its income from the activity would disappear. If all costs except personnel, goods, depreciation and property taxes could be eliminated, in the short term divestiture of insecticide distribution would have a negative effect of about L.E. 15.7 M on PBDAC's profit and loss statement.

Feed

4.88 PBDAC procures raw material for livestock feed (e.g. yellow corn, cottonseed meal) and distributes it to Ministry of Industry (MOI) feed mills. In addition, PBDAC distributes feed from MOI feed mills to public and private sector end users. The following table (based on Tables D-19 to D-21) shows PBDAC's income and expenses for feed distribution during the period 1986-1988.

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FEED - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	10.026	4.873	5.153	0.5
1987	11.497	5.870	5.627	0.49
1988	13.154	6.450	6.704	0.51

4.89 These figures show that feed distribution is a lucrative activity, in which net income amounted to about 50% of total income over the period in question. Between 1986 and 1988 income rose by L.E. 3.1 M and expenses by L.E. 1.6 M, increasing net income by L.E. 1.5 M and keeping its share in total income nearly constant.

4.90 The increased income between 1986 and 1988 was due to augmentation in the various types of commissions. The major cost increases during the same period were in personnel expenses (both direct and indirect, totalling L.E. 0.9 M), in interest and financing expenses (L.E. 0.457 M), and in depreciation and other provisions (L.E. 0.153 M).

4.91 If feed distribution is not handled by PBDAC, its income from this activity would terminate. Assuming that in the short term all costs except personnel, goods, depreciation and property taxes could be eliminated, divestiture of feed distribution would imply for PBDAC a loss of L.E. 11.9 M in comparison with 1988.

Spare Parts and Sprayers

4.92 The major activity of the PBDAC Spare Parts Dept. is importation and supply of sprayers and related equipment to the Ministry of Agriculture and to cooperatives. Income and expenses for this activity for the last three years (Tables D-22 to D-24) were:

SPARE PARTS & SPRAYERS - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	2.590	1.563	1.027	0.40
1987	2.975	1.648	1.327	0.45
1988	3.143	1.867	1.276	0.41

4.93 It is seen that between 1986 and 1988 total income increased by L.E. 0.55 M (21%) and expenses by L.E. 0.3 M (19%), so that the share of net in total income remained nearly constant. The main cost increases were in direct personnel expenses (L.E. 0.240 M).

4.94 If PBDAC gets out of the distribution of and sprayers, its

income from this activity will disappear, while at least the personnel, goods, depreciation and property tax charges are likely to remain in the short term, which would imply for PBDAC a decrease of L.E. 2.572 M in its total net income.

New Jute Bags

4.95 Except for direct sales of domestically manufactured jute bags to sugar refineries, PBDAC has a monopoly on the distribution of imported and locally produced jute bags. These bags are sold (mostly on credit) to farmers for packing their products, as well as for non-agricultural purposes such as roof tarring, sandbags for the Armed Forces, etc. PBDAC charges a commission of 16% on these sales. PBDAC's income and expenses in 1986-1988 on handling new jute bags (Tables D-25 to D-27) was as follows:

NEW JUTE BAGS - INCOME AND EXPENSES (L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	8.637	5.121	3.516	0.41
1987	9.017	5.531	3.486	0.39
1988	10.517	6.985	3.532	0.34

4.96 The above numbers indicate that during the period considered, both income and expenses of the activity increased by about L.E. 1.88 M, so that net income stayed nearly constant at about L.E. 3.5 M but its part in total income dropped from 0.41 to 0.34.

4.97 The main cost increases were in direct financing charges (L.E. 1.5 M) and in direct personnel costs (L.E. 0.5 M). Interestingly, indirect personnel costs derceased by L.E. 0.18 M during the period.

4.98 If PBDAC divests itself of this activity, its income would disappear. Under the assumption that all costs except personnel, goods, depreciation and property taxes could be eliminated, in the short term divestiture of new jute bag sales would decrease PBDAC's net income by L.E. 7.2 M in comparison with 1988.

Supply

4.99 PBDAC purchases certain crops from the farmers at guaranteed floor prices on behalf of the Ministry of Supply (MOS), when the farmers cannot find a more advantageous price in the free market. PBDAC transports these products to MOS warehouses. For these services PBDAC is compensated by MOS. PBDAC's income and expenses in 1986-1988 for handling these supply operations (Tables D-28 to D-30) were as follows:

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SUPPLY - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	24.858	10.646	14.212	0.57
1987	(Cannot be completed due to missing data about PBDAC)			
1988	25.919	13.096	12.823	0.49

4.100 The above numbers indicate that for PBDAC the supply activity is both significant and quite profitable. Among all non-bankding activities, supply generates the second largest total income and net income, after fertilizers; it also shows the second highest ratio of net to total income, after feed.

4.101 Between 1986 and 1988, total income of the supply activity (which is due almost entirely to commissions) increased by only L.E. 1.1 M while expenses augmented by L.E. 2.5, so that net income decreased by L.E. 1.4 M, and its share in total income dropped from 0.57 to a still hefty 0.49.

4.102 The main cost increases between 1986 and 1988 were in direct personnel expenses (L.E. 2.3 M or 38%), as well as depreciation and other provisions (L.E. 0.47 M or 76%). Interestingly, indirect personnel expenses dropped over the period in question by L.E. 0.656 million.

4.103 If PBDAC were to cease its handling of crops on behalf of MOS, its income from this source would be cut off. Supposing that in the short term all expenses except personnel, goods, depreciation and property taxes would likewise be eliminated, giving up the supply activity would signify for PBDAC a loss of L.E. 23.5 M in comparison with 1988.

Commercial Operations

4.104 PBDAC's commercial operations consist mainly of :

(a) sale of foliar fertilizers, pesticides and imported vegetable seeds through the Agricultural Chemicals Dept.;

(b) sale of tractors and tractor implements through the Agricultural Machinery Dept.; and

(c) sale of livestock and poultry equipment through the Agricultural Development Inputs (Equipment) Dept.

4.105 Income and expenses of commercial operations for the last three years (Tables D-31 to D-33) were:

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COMMERCIAL OPERATIONS - INCOME AND EXPENSES (IN L.E. MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	13.785	6.828	6.957	0.50
1987	18.141	11.194	6.947	0.38
1988	16.867	10.103	6.764	0.40

4.106 The above table shows that PBDAC incurs a net income of nearly L.E. 7 annually on its commercial operations. Nearly the entire income is derived from commissions on sales, which are mostly done on consignment basis.

4.107 Between 1986 and 1988 total income increased by L.E. 3.1 M, but costs increased by L.E. 3.3 M so that net income declined by L.E. 0.193 M and its part in total income dropped from 0.50 to 0.40 (still a very satisfactory share). The major cost increases were in direct personnel expenses (L.E. 2.0 M) and financing costs (L.E. 1.1 M).

4.108 If PBDAC were to divest itself of this function, its income from commercial operations would disappear. If all costs except personnel, goods, depreciation and property taxes could be suppressed, in the short term divestiture of commercial operations would signify a reduction of PBDAC's net income by L.E. 14.986 M.

Fumigation

4.109 PBDAC has a fumigation activity which performs pest control for PBDAC warehouses. This operation has expanded its scope to perform similar services for other public and private entities. Income and expenses of the fumigation function during the last three years (Tables D-34 to D-36) were:

FUMIGATION - INCOME AND EXPENSES (IN LE MILL.)

Year	Total Income	Expenses	Net Income	Net Income: Total Income
1986	0.936	1.265	(0.329)	(0.35)
1987	1.211	1.449	(0.238)	(0.20)
1988	1.564	1.848	(0.284)	(0.18)

4.110 The above table shows that the volume of this operation is small, and that the prices charged for its services are not sufficient for breaking even - the fumigation function incurred losses of about L.E. 0.3 M per year.

4.111 Especially revealing is the cost accounting for 1987 (Table D-35), which contains a breakdown of the income from fumigation.

The table indicates that only about 28% of this income is obtained from fumigation of PBDAC's own warehouses. The bulk of the income (53%) is obtained from performing fumigation services for other public and private entities, and sale of fumigation inputs. Thus the fumigation function is engaged mostly in performing for non-PBDAC entities, at a loss, a specialized service which is normally offered by the private sector at a profit.

4.112 If divestiture will take the form of transferring the fumigation services to the private sector, while keeping the employees and associated costs of the activity, divestiture of the fumigation operation will mean for PBDAC an annual loss of L.E. 1.3 M in comparison with 1988.

Financial Implications for PBDAC of Inputs Divestiture

Effect of Divestiture on Net Operating Income

4.113 The two foregoing sections are summarized in the following table, which shows the financial effect on PBDAC in the short term of divestiture of various activities. For purposes of comprehensivenenss, PBDAC's banking operations are also included in the table.

FINANCIAL EFFECT OF DIVESTITURE (IN L.E. MILL.)

Activity	1987/8 Total Income	1987/8 Expenses	1987/8 Net Income	Net to Total Income	Costs After Divest.	Loss From Divest.
Banking operations						
Agric. credit	108.478	81.317	27.161	0.25	(a)	(a)
Invest. credit	237.975	194.802	43.173	0.18	(a)	(a)
Banking trans.	27.238	18.251	8.986	0.33	(a)	(a)
Total, banking	373.691	294.370	79.320	0.21	(a)	(a)
Input operations						
Fertilizers	61.924	39.889	22.035	0.36	27.965	50.000
Seeds	5.138	4.854	284	0.06	3.608	3.892
Pesticides	21.590	15.988	5.602	0.26	10.084	15.686
Feed	13.154	6.450	6.704	0.51	5.222	11.926
Spare parts	3.143	1.867	1.276	0.41	1.296	2.572
New jute bags	10.517	6.985	3.532	0.34	3.632	7.164
Supply	25.919	13.096	12.823	0.49	10.629	23.452
Commercial op.	16.867	10.103	6.764	0.40	8.222	14.986
Fumigation	1.564	1.848	(284)	(0.18)	1.591	1.307
Total, inputs	159.816	101.080	58.736	0.37	72.249	130.985
Grand total	533.507	395.450	138.056	0.26	(a)	(a)

(a) Not relevant, since these activities are not to be divested.

4.114 As discussed in Par. 4.74, in the above table the costs assumed to be retained after divestiture consist of: (Bab I = personnel costs) + (Bab II.A = goods) + (depreciation) + (property taxes). The detail of these retained costs is shown in Table IV-10.

4.115 The above table shows that in 1988 input operations, taken as a whole, accounted for 30% of PBDAC's total income, 26% of its

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expenses and fully 43% of its net income. The share of net in total income was generally much higher for input operations than for banking operations: around 50% for feed and supply activities, about 40% for spare parts and commercial activities, around 35% for fertilizers and jute bags, and 26% for pesticides. Only the relatively small seed and fumigation activities had small or negative profit margins. In contrast, for PBDAC's main banking activities - agricultural production and investment credits - the share of net in total income was 0.25 and 0.18 respectively.

4.116 The following assumptions were used to calculate the effect of divestiture of input distribution on PBDAC's financial position:

(a) all input activities will be completely phased out over a period of five years;

(b) income from these activities will decrease linearly over the same period;

(c) the number of employees engaged in inputs distribution will decrease linearly from an estimated 16,500 employees in 1988 to 11,000 employees five years later;

(d) the other, relatively minor retained expenses (Table IV-10) will likewise decrease linearly over the five-year phase-out period.

4.117 With these assumptions, the effect of divestiture of inputs distribution on PBDAC's net income position will be as follows:

FINANCIAL EFFECTS OF INPUTS DIVESTITURE (IN L.E. '000)

Item	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Income	159.816	127.853	95.890	63.926	31.963	0
Employee-related expenses	72.249	67.432	62.616	57.799	52.983	48.166
Other expenses	28.831	23.065	17.299	11.532	5.799	0
Net income	58.736	37.356	15.975	(5.405)	(26.819)	(48.166)
Reduction in income compared with base year	0	21.380	42.761	64.141	85.555	106.902

4.118 The above calculations indicate that if input distribution phased out over a period of five years, the reduction of PBDAC's income in years 1,2,3 and 4 will be L.E. 21.4 M, L.E. 42.8 M, L.E. 64.1 L.E. and L.E. 85.6 M respectively. At the end of this period, PBDAC will forego an income of about L.E. 107 M per year compared with its 1987/88 net income.

Effect of Divestiture on Net Profits

4.119 In considering the effect of a reduction in PBDAC's net income, it is important to examine the present destination of this income. For the last four years, the breakdown was as follows:

DISTRIBUTION OF PBDAC'S NET INCOME (IN L.E. MILLION)

Item	1984/ 1985	1985/ 1986	1986/ 1987	1987/ 1988
Islamic credit associations	0.455	0.497	0.584	0.722
Expenses of former years	2.829	7.767	3.335	3.079
Nasr Bank (welfare purposes)	1.856	2.096	2.437	2.746
Sports committee	0.236	0.243	0.270	0.289
Commercial profit tax	53.072	63.644	78.325	92.531
Additions to reserves	12.191	13.900	13.148	13.928
Surplus not collected by MOF	6.497	-	-	-
Profit-sharing by employees	7.837	8.114	12.386	13.745
GOE's part of the profits	31.642	38.433	38.159	45.209
Total net income (incl. misc. income and carryover)	116.616	134.693	147.644	172.250

4.120 The important point in this distribution structure is that only a small and declining part of the earnings (10.5% in 1984/85, 8.1% in 1987/88) remained in PBDAC to increase its capital. The largest part was taken by GOE as commercial profit tax. The rate of this tax is a flat 40%, but it is levied on a larger base including certain items beside the net income . Consequently, the effective tax rate on net income in 1987/88 was 53.7%.

4.121 Of the net profit after tax and after the other deductions detailed above, approximately 25% is distributed to the employees as profit-sharing and the remainder devolves to the Ministry of Finance (MOF) on behalf of GOE, as owner of PBDAC. In 1987/88, GOE's dividends amounted to 26.3% of PBDAC's net income. Thus, between tax and dividends, GOE received 80.0% of PBDAC's net income.

4.122 Because of this profit distribution structure, the net financial effect on PBDAC of divesting the input activities will be much smaller than the foregone net income of L.E. 107 million per year calculate above. The negative effects on PBDAC will consist mostly of:

- reductions in the additional reserves it could set aside to build up its equity (l.E. 13.9 M in 1987/88), and

- reductions in employee profit-sharing benefits (L.E. 13.7 M in 1987/88).

4.123 The chief party affected financially by the divestiture will be the GOE, which will fail to receive about 80% of PBDAC's net income foregone. The MOF should weigh this expected loss of tax and dividend income against the additional tax income it would obtain from the private sector if it assumed input distribution, as well as the larger tax base from more dynamic agriculture which is expected to result from private-sector distribution of agricultural inputs.

4.124 As already mentioned the above calculations do not take into account changes in the level and compositions of the loan portfolio or the rate of recovery of the loans. Obviously this will not be the case. THe future lending activity of PBDAC is presently the subject of an intensive study. This study should make it possible to arrive at more realistic and accurate estimates of the effects of privatization of inputs and enlarged credit operations on the finances of PBDAC.

TABLE IV-1: PBDAC GROUP - CONSOLIDATED BALANCE SHEETS

	1984/85			1985/86			1986/87			1987/88				
A S S E T S :	(LE 000)	% of Total	% Change Prev Year	(LE 000)	% of Total	% Change Prev Year	(LE 000)	% of Total	% Change Prev Year	(LE 000)	% of Total	% Change Prev Year	% Change Five Year	Average % of Total Five Year
CURRENT ASSETS :														
Cash & Banks	9,299	0.5%	740.0%	8,752	0.4%	-5.9%	64,226	1.9%	633.8%	39,024	0.9%	-39.2%	3425.2%	0.93%
Investments	19,603	1.1%	17.4%	22,443	0.9%	14.5%	24,733	0.7%	10.2%	27,518	0.7%	11.3%	64.8%	0.85%
Due from Government	140,088	8.2%	50.2%	229,852	9.2%	64.1%	384,669	11.4%	67.4%	670,442	16.0%	74.3%	618.8%	11.57%
Other Receivables	193,979	11.3%	11.5%	285,718	11.5%	47.3%	316,647	9.4%	10.8%	443,518	10.6%	40.1%	155.0%	10.78%
Agricultural Inputs	143,244	8.4%	-0.7%	210,373	8.4%	46.9%	227,436	6.7%	8.1%	303,166	7.2%	33.3%	110.2%	7.84%
Inputs on Order	63,691	3.7%	20.2%	81,193	3.3%	27.5%	137,507	4.1%	69.4%	201,395	4.8%	46.5%	280.2%	4.09%
Seasonal Loans	229,995	13.4%	-0.9%	326,671	13.1%	42.0%	422,452	12.5%	29.3%	568,973	13.6%	34.7%	145.0%	13.57%
Total Current Assets	799,900	46.7%	12.0%	1,165,004	46.8%	45.6%	1,577,669	46.8%	35.4%	2,254,035	53.9%	42.9%	215.5%	49.63%
Total Term Loans	863,849	50.4%	41.9%	1,265,614	50.8%	46.5%	1,728,868	51.3%	36.6%	1,792,424	42.8%	3.7%	194.4%	47.71%
Food Security Loans	440,235	25.7%	36.0%	591,071	23.7%	34.3%	795,153	23.6%	34.5%	735,088	17.6%	-7.6%	127.0%	21.99%
Fixed Assets & Other	50,474	2.9%	47.6%	60,254	2.4%	19.4%	66,840	2.0%	10.9%	136,925	3.3%	104.9%	300.4%	2.66%
TOTAL ASSETS :	1,714,222	100.0%	26.3%	2,490,871	100.0%	45.3%	3,373,377	100.0%	35.4%	4,183,384	100.0%	24.0%	208.2%	100.00%
C A P I T A L & L I A B I L I T I E S :														
CURRENT LIABILITIES :														
Current A/Cs & Savings	348,941	20.4%	18.5%	433,537	17.4%	24.2%	584,076	17.3%	34.7%	670,490	16.0%	14.8%	127.7%	17.77%
Term Deposits	225,954	13.2%	26.0%	273,360	11.0%	21.0%	321,056	9.5%	17.4%	381,986	9.1%	19.0%	113.1%	10.53%
Retirement & Bonus A/Cs	21,256	1.2%	29.9%	24,502	1.0%	15.3%	28,801	0.9%	17.5%	32,679	0.8%	13.5%	99.7%	0.94%
Accounts Payable	386,324	22.5%	14.5%	560,056	22.5%	45.0%	753,943	22.3%	34.6%	1,125,162	26.9%	49.2%	233.5%	24.11%
Letters of Credit	127,231	7.4%	43.0%	211,820	8.5%	66.5%	262,486	7.8%	23.9%	306,629	7.3%	16.8%	244.7%	7.60%
Total Current Liab.	1,109,707	64.7%	21.1%	1,503,275	60.4%	35.5%	1,950,362	57.8%	29.7%	2,516,945	60.2%	29.1%	174.6%	60.95%
Advances from Com.Banks	360,754	21.0%	54.2%	693,303	27.8%	92.2%	1,078,241	32.0%	55.5%	1,131,067	27.0%	4.9%	383.3%	26.66%
Other Local Loans	8,289	0.5%	33.8%	7,278	0.3%	-12.2%	7,012	0.2%	-3.6%	6,562	0.2%	-6.4%	5.9%	0.27%
Foreign Loans	35,882	2.1%	47.9%	46,982	1.9%	30.9%	55,595	1.6%	18.3%	179,996	4.3%	223.8%	641.8%	2.61%
Payables to M.Finance	31,642	1.8%	11.3%	38,433	1.5%	21.5%	37,159	1.1%	-3.3%	45,209	1.1%	21.7%	59.1%	1.38%
Other Liabilities	54,259	3.2%	10.4%	67,967	2.7%	25.3%	90,263	2.7%	32.8%	133,331	3.2%	47.7%	171.2%	3.01%
Bad Debts Provision		0.0%	ERR		0.0%	ERR		0.0%	ERR		0.0%	ERR	ERR	0.00%
Total M/L-Term Liab.	490,825	28.6%	43.5%	853,962	34.3%	74.0%	1,268,270	37.6%	48.5%	1,496,165	35.8%	18.0%	337.4%	33.93%
Total Liabilities	1,600,531	93.4%	27.2%	2,357,238	94.6%	47.3%	3,218,632	95.4%	36.5%	4,013,110	95.9%	24.7%	218.9%	94.88%
CAPITAL & RESERVES :														
Capital	50,650	3.0%	0.0%	55,784	2.2%	10.1%	62,009	1.8%	11.2%	62,009	1.5%	0.0%	22.4%	2.14%
Reserves	63,041	3.7%	30.9%	77,849	3.1%	23.5%	92,736	2.7%	19.1%	108,265	2.6%	16.7%	124.8%	2.97%
Sub - Total	113,691	6.6%	15.0%	133,633	5.4%	17.5%	154,745	4.6%	15.8%	170,274	4.1%	10.0%	72.3%	5.12%
TOTAL CAP. & LIAB.	1,714,222	100.0%	26.3%	2,490,871	100.0%	45.3%	3,373,377	100.0%	35.4%	4,183,384	100.0%	24.0%	208.2%	100.00%

Table IV-2: GOVERNORATE BANKS - NET INCOME, TURNOVER , ASSETS, EQUITY & CAPITAL (in LE '000)

GOVERNORATE :	Net Profit		Total Turnover		Total Assets		Total Equity		Capital	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Beheira	6,654	6,166	169,229	116,724	322,176	324,923	18,824	20,593	5,544	5,544
Kafr El-Sheikh	5,675	7,779	82,388	74,928	130,499	144,534	7,333	8,234	2,533	2,533
Gharbiya	4,268	4,284	111,478	77,635	191,566	194,891	10,250	11,539	4,371	4,371
Daqahliya	5,762	6,657	241,407	206,701	284,106	309,899	14,714	16,590	4,042	4,042
Damietta	N.A.	822	18,066	16,656	35,816	45,701	3,154	3,534	2,092	2,092
Sharqiya	4,607	5,849	218,696	202,220	213,004	257,905	12,020	13,529	3,905	3,905
Ismailiya	851	1,133	26,379	23,174	44,830	55,708	4,502	4,743	3,538	3,538
Menufiya	2,669	2,587	124,628	112,829	194,262	203,432	8,374	9,077	3,790	3,790
Qalyubiya	1,986	2,691	66,681	59,963	104,522	138,509	6,770	7,502	3,354	3,354
Giza	3,514	3,274	68,374	69,295	113,205	153,637	8,084	8,763	3,062	3,062
Beni Suwef	2,076	1,919	43,462	46,040	77,750	96,344	4,542	5,135	2,013	2,013
Fayoum	2,425	2,579	93,329	83,017	114,443	124,146	7,056	7,750	4,409	4,409
Minya	3,278	3,489	71,168	81,620	N.A.	187,368	8,605	10,947	3,508	3,508
Assyout	4,198	3,576	83,333	57,751	186,758	192,271	9,720	10,644	3,259	3,259
Sohag	1,258	1,641	118,072	119,118	180,400	200,986	6,825	7,271	5,092	5,092
Qena	4,125	6,152	76,826	68,124	182,084	209,579	8,081	9,676	2,571	2,571
Aswan	N.A.	1,188	21,163	17,436	N.A.	61,870	N.A.	3,703	1,426	1,426
A V E R A G E :	3,556	3,634	96,158	84,308	158,361	170,677	8,678	9,366	3,442	3,442

TABLE IV-3: GOVERNORATE BANKS: RANKING IN TERMS OF RETURN ON TURNOVER, ASSETS AND EQUITY
(1=BEST, 17=WORST)

GOVERNORATE :	Return on Turnover				Return on Assets				Return on Equity			
	1986/87		1987/88		1986/87		1987/88		1986/87		1987/88	
Beheira	(6)	3.93%	(6)	5.28%	(9)	2.07%	(11)	1.90%	(9)	35.35%	(13)	29.94%
Kafr El-Sheikh	(1)	6.89%	(1)	10.38%	(1)	4.35%	(1)	5.38%	(1)	77.39%	(1)	94.48%
Gharbiya	(7)	3.83%	(5)	5.52%	(6)	2.23%	(4)	2.20%	(6)	41.64%	(7)	37.12%
Daqahliya	(10)	2.39%	(13)	3.22%	(10)	2.03%	(5)	2.15%	(7)	39.16%	(4)	40.13%
Damietta	N.A.	N.A.	(7)	4.94%	N.A.	N.A.	(15)	1.80%	N.A.	N.A.	(16)	23.26%
Sharqiya	(13)	2.11%	(15)	2.89%	(7)	2.16%	(3)	2.27%	(8)	38.33%	(3)	43.23%
Ismailiya	(11)	3.23%	(8)	4.89%	(12)	1.90%	(8)	2.03%	(13)	18.90%	(15)	23.90%
Menufiya	(12)	2.14%	(16)	2.29%	(13)	1.37%	(16)	1.27%	(11)	31.87%	(14)	28.50%
Qalyubiya	(8)	2.98%	(10)	4.49%	(11)	1.90%	(13)	1.94%	(12)	29.33%	(8)	35.87%
Giza	(3)	5.14%	(9)	4.72%	(2)	3.10%	(6)	2.13%	(4)	43.47%	(6)	37.36%
Beni Suwef	(5)	4.78%	(12)	4.17%	(3)	2.67%	(9)	1.99%	(3)	45.70%	(5)	37.37%
Fayoum	(9)	2.60%	(14)	3.11%	(8)	2.12%	(7)	2.08%	(10)	34.37%	(10)	33.28%
Minya	N.A.	N.A.	(11)	4.27%	N.A.	N.A.	(12)	1.86%	N.A.	N.A.	(12)	31.87%
Assyout	(4)	5.04%	(4)	6.19%	(5)	2.25%	(14)	1.36%	(5)	43.39%	(9)	33.60%
Sohag	(14)	1.07%	(17)	1.38%	(14)	0.70%	(17)	0.82%	(14)	18.43%	(17)	22.57%
Qena	(2)	5.37%	(2)	9.03%	(4)	2.27%	(2)	2.94%	(2)	51.05%	(2)	63.58%
Aswan	N.A.	N.A.	(3)	6.81%	N.A.	N.A.	(10)	1.93%	N.A.	N.A.	(11)	32.09%
A V E R A G E :		4.29%		4.92%		2.22%		2.15%		39.16%		38.13%

TABLE IV.4 : PBDAC GROUP - CONSOLIDATED:SHORT-TERM AND MEDIUM-TERM AGRICULTURAL LOANS PORTFOLIO (IN LE '000)

	1984/85		1985/86		1986/87		1987/88	
	Total Amount Due	Percent of Total	Total Amount Due	Percent of Total	Total Amount Due	Percent of Total	Total Amount Due	Percent of Total
SHORT-TERM LOANS:								
Agricultural production credit	229,995	21.65%	326,671	21.10%	422,452	20.05%	568,373	25.06%
MEDIUM-TERM LOANS:(a)								
Food security loans (subsid.)	440,235	41.44%	591,071	38.19%	795,153	37.74%	735,088	32.37%
Investment loans (unsubsid.)	392,033	36.91%	630,162	40.71%	889,253	42.21%	966,585	42.57%
Total, medium-term loans (b)	832,268	78.35%	1,221,233	78.90%	1,684,406	79.95%	1,701,673	74.94%
Total, agric.loans (ST and MT)	1,062,263	100.00%	1,547,904	100.00%	2,106,858	100.00%	2,270,046	100.00%

(a) Both medium-term and short-term components of the investment loans

(b) Not including loans for diverse purposes (e.g. importation of inputs) and Islamic loans.

Source : PBDAC annual balance sheets

TABLE IV-5: PBDAC GROUP - CONSOLIDATED:PAYMENTS DUE ON INVESTMENT LOANS (IN LE '000)

	Loans			Payments Due During Year				Payments Not Yet Due			Total Loans Out-Standing
	Brought Forward	New Credits	Total	Total Due	Paid	Out-Standing	% Paid	Total Not Due	Pre-Paid	Out-Standing	
SHORT-TERM INV. LOANS:											
1985/86 :	248,760	647,608	896,368	516,070	492,556	23,514	95.44%	380,298	20,475	359,822	383,336
1986/87 :	380,121	964,573	1,344,694	819,288	787,350	23,937	96.10%	525,407	19,905	505,502	529,439
1987/88 :	540,528	1,047,373	1,587,901	946,964	899,403	47,561	94.98%	640,937	8,906	632,031	679,592
MEDIUM-TERM INV. LOANS:											
1985/86 :	571,229	513,630	1,084,859	296,554	262,109	34,445	88.39%	788,305	9,657	778,649	813,094
1986/87 :	809,527	687,768	1,497,294	444,528	396,751	47,777	89.25%	1,052,766	10,226	1,042,540	1,090,317
1987/88 :	1,087,579	400,680	1,488,260	514,272	445,197	69,075	86.57%	973,988	10,287	963,701	1,032,776
TOTAL INV. LOANS:											
1985/86 :	819,989	1,161,238	1,981,227	812,624	754,666	57,958	92.87%	1,168,603	30,132	1,138,471	1,196,429
1986/87 :	1,189,648	1,652,341	2,841,989	1,263,816	1,184,101	79,715	93.69%	1,578,173	30,131	1,548,042	1,627,757
1987/88 :	1,628,107	1,448,053	3,076,161	1,461,235	1,344,600	116,635	92.02%	1,614,925	19,193	1,595,732	1,712,367

TABLE IV-6 : PBDAC GROUP - CONSOLIDATED: RECOVERY OF SHORT-TERM AGRICULTURAL CREDIT DURING 1987 (IN LE '000)

ITEM	CARRIED FORWARD FROM 1986,OR TOTAL CREDIT IN 1987	RECOVERED 1/1/87 - 12/31/87	BALANCE ON 12/31/87	% OF CREDIT RECOVERY
A.CREDIT EXTENDED PRIOR TO 1987				
A.1 RESCHEDULED REPAYMENTS (a)	3,260	896	2,363	27.50%
A.2 CREDITS IN ARREARS	4,364	1,730	2,634	39.64%
TOTAL PRE - 1987 CREDITS OUTSTANDING	7,624	2,626	4,997	34.44%
B. CREDITS EXTENDED IN 1987				
B.1 CREDITS EXTENDED IN '87, DUE IN '87	590,343	588,366	1,977	99.67%
B.2 CREDITS EXTENDED IN '87, DUE IN '88	263,055	12,739	250,316	4.84%
C. INTERESTS AND PENALTIES				
C.1 INTEREST PAYMENTS				
Due in '87	28,285	28,212	73	99.74%
Not due in '87	16,446	1,149	15,297	6.99%
TOTAL	45,731	29,361	15,370	65.64%
C.2 LATE PAYMENT PENALTIES				
Due in '87	1,243	1,002	241	80.60%
Not due in '87	174	12	162	6.97%
TOTAL	1,417	1,014	403	71.57%
TOTAL A+B+C	907,170	634,106	273,064	69.90%
Total repayments not due in '87	282,783	13,977	268,806	4.94%
Total repayments due in '87	624,386	620,129	4,257	99.32%

(a) Debts which had to be rescheduled due to crop failure or other force majeure.

Note: Totals may contain round-off errors
Source: PBDAC

TABLE IV-7 : PBDAC GROUP - CONSOLIDATED : RECOVERY OF SHORT-TERM AGRICULTURAL CREDIT, 1982 - 1987 (IN LE '000)

Year	Credit Due	Credit Recovered	Balance Due	% Recovery
1982	265,203	259,013	6,191	97.67 %
1983	286,017	281,058	4,959	98.27 %
1984	325,971	322,159	3,812	98.84 %
1985	359,341	356,271	3,070	99.14 %
1986	492,502	489,198	3,304	99.32 %
1987	624,386	620,129	4,257	99.32 %

Note : Totals may include round-off error
SOURCE : PBDAC

TABLE IV-8 : SUBSIDIZED VS. UNSUBSIDIZED PRODUCTION CREDIT (IN LE '000)

Year	Season	Subsidized	Unsubsidized	Total
85/86	Winter & sugarcane	139,163	12,123	151,286
	Summer & nili	277,350	48,207	325,557
	Total	416,514	60,330	476,844
86/87	Winter & sugarcane	178,833	44,128	222,761
	Summer & nili	290,981	92,407	383,388
	Total	469,815	136,535	606,149
87/88	Winter & sugarcane	199,225	56,523	255,748
	Summer & nili	n/a	n/a	n/a
	Total	n/a	n/a	n/a

TABLE IV-9 : PBDAC GROUP - CONSOLIDATED: RECOVERY OF INVESTMENT CREDITS, 1/7/87 TO 30/6/88 (IN LE '000)

ITEM	Balance Brought Forward	New Credits	Total	Install-ments Due	Install-ments Due & Paid	Balance Due	% of Recovery	Install-ment Not Yet Due	Payments on Installments Not Yet Due	Balance Not Yet Due
Short-term invest. credits										
Livestock projects	456,614	877,154	1,333,768	775,663	741,462	34,202	95.59%	557,105	7,275	550,830
Poultry projects	61,834	148,049	209,883	149,290	138,514	10,776	92.78%	60,593	1,451	59,137
Others	22,080	22,170	44,250	22,010	19,427	2,583	88.26%	22,239	175	22,064
Subtotal, short-term credits	540,528	1,047,373	1,587,901	946,964	899,403	47,561	94.98%	640,937	8,906	632,031
Medium-term inv. credits *										
Livestock projects	477,083	79,535	556,618	213,163	192,515	20,649	90.31%	343,455	3,741	339,714
Poultry projects	103,003	36,825	139,829	63,039	40,681	22,357	64.53%	76,790	184	76,606
Machinery loans	274,766	148,580	423,346	112,080	105,882	6,198	94.47%	311,265	3,266	308,000
Land reclamation	13,454	2,885	16,339	1,931	1,752	179	90.71%	14,408	29	14,379
Fishery projects	2,382	1,140	3,523	1,377	1,080	297	78.43%	2,146	-	2,146
Orchards	6,593	2,275	8,868	1,995	1,499	496	75.14%	6,873	7	6,866
Consumer durables	17,852	5,426	23,278	11,630	10,433	1,197	89.71%	11,648	157	11,491
Others	192,446	124,014	316,460	109,057	91,356	17,701	83.77%	207,403	2,903	204,500
Subtotal, medium-term credits	1,087,579	400,680	1,488,260	514,272	445,197	69,075	86.57%	973,988	10,287	963,702
Total investment credits	1,628,107	1,448,053	3,076,161	1,461,235	1,344,600	116,635	92.02%	1,614,925	19,193	1,595,732

* Including what was formerly classified as long-term credits (land reclamation)

Note : Sums may include round-off errors

Source: PBDAC

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TABLE IV-10 : PBDAC INPUT COSTS LIKELY TO BE RETAINED AFTER DIVESTITURE
(IN LE '000)

Activity	Personnel (Bab I)	Goods (Bab II.A)	Depre-ciation	Property Taxes	Total Costs
Fertilizers	26,347	279	1,332	7	27,965
Seeds	3,499	28	81	-	3,608
Pesticides	9,812	54	218	-	10,084
Feed	5,055	34	131	2	5,222
Spare Parts	1,267	11	18	-	1,296
New Jute Bags	3,499	31	102	-	3,632
Supply	9,903	199	526	1	10,629
Commercial Op.	8,147	25	49	1	8,222
Fumigation	1,300	259	32	-	1,591
Total inputs	68,829	920	2,489	11	72,249

V. SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 This chapter provides an overview of and points to significant commonalities and distinguishing characteristics among findings and conclusions reported for each of the principal PBDAC inputs studied. It further summarizes the findings of the organization, staffing, financial, and economic sections of the report and annexes.

Summary of Findings

5.2 If the final objective is privatization then divestiture, that is the creation of a new governmental entity to which all or some of PBDAC's input operations would be transferred, is not a good option. Its only advantage is that PBDAC will disengage itself of its non-banking functions. The disadvantages are many. Among others, it does not provide for competition. It will delay privatization. Overhead costs will increase. The new entity will create entrenched interests which will be more reluctant to encourage privatization than PBDAC itself. Divestiture may, however, be considered as an intermediate step towards privatization if progress towards privatization is slower than desired and if the disengagement of PBDAC's banking from its input supply activity is seen to be urgent.

5.3 Divestiture combined with the employee share ownership plan (ESOP) has been suggested as a possible option. Under this proposal a new company would be created that would carry out the entire input operations of PBDAC. All PBDAC employees presently engaged in input activities presumably would be transferred to this new company. PBDAC or other governmental entity, it is further suggested, would own 30 to 40 percent of the share capital while the remainder would be owned by the employees and others in the private sector.

5.4 This option is unlikely to solve the problems mentioned above. More importantly, the ESOP approach seems hardly applicable to PBDAC's input supply operations. The ESOP plan is based on the belief that worker participation in profits will sharpen motivation for better performance. But the profitability of the new company, as is the case with PBDAC, would depend on commissions fixed by the government rather than on the performance of its employees. Furthermore, it is likely that costs of operations would increase because additional employees would be required to replace those who presently engage in both credit and input activities. Considerable capital investment would be needed, investment that in the aggregate may well prove to be beyond the means of employees holding shares. Finally, for political reasons, the government might be put in the undesirable position of having to guarantee an unreasonable level of profit in order to satisfy the demands of

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worker-share owners.

5.5 Presently there are about 16,500 PBDAC employees directly or indirectly engaged in input distribution. The disengagement of PBDAC from input distribution over a period of five years may reduce the number of employees by no more than 5,500.

5.6 If PBDAC were to disengage itself from input distribution in a period of five years, the foregone income from input distribution, the inevitable staff-related expenses, and the other expenses that cannot be eliminated translate into an adverse financial effect of LE 21 million, LE 43 million, LE 64 million, and LE 86 million in each of the first four years respectively. In year five and onwards the foregone income and expenses add up to LE 107 million.

5.7 Removal of subsidies has an effect, as measured on the representative crop rotations, of decreasing average gross margins of the farmers by 11.3 percent, with a low side of 9.3 percent and a high side of 13.6 percent. With subsidy removal for all crops except cotton, the range in gross margin reductions is from 4.3 percent to 8.1 percent. With an increase in fertilizer and cotton pest control costs to shadow farm gate prices and corresponding adjustment of cotton, wheat, rice, maize, sugarcane, and sorghum prices to the shadow farm gate levels, the resulting average gross margins increase by 56.6 percent, with a range from plus 13.5 percent to plus 79 percent. If input prices and crop prices of all crops in the rotation were adjusted to shadow farm gate prices and cotton remained constant, the average decrease in gross margins would be 6 percent. A slight increase in cotton prices would offset this reduction.

5.8 Subsidy removal would save the government a minimum of LE 317 million annually.

5.9 Besides serving the farmer, PBDAC in its input activities provides services to entities of the Government of Egypt. These services include providing pesticides for MOA cotton application; sprayers for the MOA; animal feed for the army, prisons, quarantine stations, and MOA livestock farms; jute bags for feed mills; and cotton for cotton gins.

5.10 It is impossible to draw up a tight schedule for privatization. The process of privatization envisaged by this study anticipates the completion of the process in about five years. Even assuming the government's full cooperation in privatization, the extent of the private sector's interest and involvement will depend on many factors, some of which are impossible to foresee at this time. It is only after the process has begun and an interim evaluation of the degree of success with privatization has been made that the future course of action can be charted in detail.

5.11 The nature of the activities of PBDAC in the distribution of inputs varies from one input category to another. A uniform approach is not applicable. Therefore recommendations for privatization should be input-specific, with a commodity category approach.

5.12 PBDAC is unquestionably Egypt's largest distributor of seed, feed, fertilizer, pesticides, agricultural machinery, and jute bags. Centrally planned input allocation systems, particularly in the case of seed, fertilizer, and pesticides for field crops and feed for dairy and fattening programs have relied almost entirely upon PBDAC for distribution. An extensively used system for providing short-term credit is linked to the provision of the field crop inputs. While PBDAC is also an important agricultural machinery distributor, its role as a distributor is currently less critical than is the case with other inputs. All of the inputs distributed by PBDAC are, in different manners and degrees, subsidized.

5.13 The private sector's role in input distribution is least developed with regard to fertilizer, where that sector is limited to the informal, secondary distribution (black market) of fertilizers used on field crops and to the importation and distribution of some of the foliar fertilizer used on cotton and of soluble fertilizers used in drip irrigation on horticultural crops.

5.14 The animal feed concentrate business has been almost entirely a public sector activity, with animal feed being produced by MOI and MOS mills and with MOI feed distributed by PBDAC. Reportedly, the private sector is involved in an informal secondary distribution (black market). Within the recent past, the private sector has been increasingly encouraged by the government to collect and pelletize roughages for public sector feed mills to be incorporated with feed grade urea and other ingredients into a non-traditional feed to make up for shortage of cotton seed cake and yellow maize. The private sector has demonstrated its ability in the poultry industry, where last year it produced and distributed roughly one half of the one million tons used.

5.15 Private sector importation and distribution of seed and pesticides has developed to a considerable degree within the realm of horticultural production. Some 75% of the vegetable seed and the majority of the pesticides used on fruits and vegetables are provided by the private sector. White maize seed is the one important field crop seed primarily produced and distributed by the private sector, although PBDAC is relied upon to distribute more than one-half of the privately produced maize seed.

5.16 Current Egyptian law restricts the private sector from importing pesticides or active ingredients for MOA and from

distributing pesticides used on "controlled" crops (now cotton, sugarcane, and rice), thus precluding private sector activity from more than 70%, by value, of the current pesticide trade.

5.17 The private sector is most active in the agricultural machinery and equipment sector, where private firms are involved in importation, manufacture, assembly, distribution, and after-sales service. There is an extensive network of foreign manufacturers' representatives.

5.18 The private sector is very much dependent upon PBDAC to provide credit to farmers for input purchases as well as, to a lesser extent, to the businesses themselves.

5.19 The private sector will require very clear and consistent leadership from the government regarding its intentions to privatize. The private sector will not, in a healthy and competitive manner supportive of free enterprise development, make further significant investment for distribution of any of the inputs without a clear definition of the future government role and intentions and consistent, timely actions by the government in accord with announced intentions.

5.20 Interviews with private sector company representatives involved with the distribution of inputs were frequently found to favor expansion of private sector distribution. These interviews, however, revealed a preference for, at least initially, some governmentally controlled allocation system whereby, after prequalifying, they would perform a service for the government at a fixed price with assured market volumes. Although they expressed familiarity with and acceptance of the concept and practice of competition in the marketplace, competing for market share was not their first choice.

5.21 Public sector officials commonly expressed the need for the government to protect the farmer by controlling supply and prices. In many cases officials did not believe that competition among private firms would work to hold down prices and expressed a basic and general mistrust of the private sector.

5.22 In general, many public sector officials interviewed (and even some businessmen) do not think of the farmer as part of the private sector but rather as the means of production to achieve centrally planned objectives. Those same officials hold that the farmer will not make rational production decisions regarding the use of inputs, credit, and sales of outputs and must be "guided" by the government.

5.23 Farmer attitudes toward privatization of input distribution are reportedly mixed. Although farmers have come to rely upon the private sector to compensate for inadequacies in the mainly governmental input supply system, they reportedly feel more secure

with governmental protection against possible private sector exploitation and would not, of course, want to lose any existing government subsidies or have their costs increase.

5.24 The public and private sectors alike insist that gradualism should characterize the privatization of input distribution. There is an understandable apprehension that changes in the distribution system may not work well and therefore cause disruption, hardship, and discontent. Gradualism has been understood, in context, as first privatizing distribution in a geographic area, of a portion of the product supply, or of a stage or level of the distribution process before proceeding to generalize the privatization to wider areas, more of the supply, or larger segments of the total process of distribution.

Recommendations

5.25 It is the consultant's conclusion that, with certain basic pre-conditions in place, privatization of the referenced inputs is not only possible, but presents a desirable set of alternatives to the present distribution systems.

5.26 In order for privatization to take place and for the private sector to maintain an efficient and cost-effective distribution network, there are some conditions which must be created and sustained:

1. Subsidies on inputs, particularly those which are currently applied during the distribution phase, must be removed to facilitate fair competition among distributors, public and private.

2. PBDAC must continue to provide credit to farmers for purchase of the inputs and also make financing available to business firms prepared to engage in input distribution.

3. Governmental policies must provide for "a level playing field", or equal opportunity among competing distributors, public and private.

4. Governmental policies should be clearly defined and adhered to.

5. It is also imperative that the government demonstrate unwavering consistency and stability in its support of the privatization process so as to encourage ample private sector participation.

6. A policy of no new hires should be instituted immediately

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and maintained throughout the transition period. Early retirement and voluntary separations should be encouraged. PBDAC should organize and assist in carrying out free or subsidized training programs for employees geared to their possible entry into the private sector input supply services or other employment in the Bank or outside.

7. Governmental entities which are recipients of PBDAC input supply services should be advised to make their own arrangements for the delivery of inputs to them by manufacturers and importers.

8. The equity base of PBDAC may have to be strengthened. Prima facie, at present the input activities are financed by PBDAC from its own financial resources as well as the government's. The transfer of these activities to the private sector will require the availability of additional credit, some of which will have to be provided by PBDAC. Capitalization of PBDAC is the subject of a separate study which will have to take into account a sound equity base for the expansion of credit to the private sector for input activities.

Approaches to Privatization

5.27 The recommended approaches to privatization of the distribution of seed, feed, fertilizer, pesticides, agricultural machinery, and jute bags have been presented along with optional approaches in Chapter II of this report. The first option recommended for each input, the alternative most strongly recommended by the consultant, involves complete privatization within four years for feed and agricultural machinery, six years for pesticides, and seven years for seeds and fertilizer. These first options recommended for all six inputs involve approaches which gradually reduce the percent of supply or amount of a category of a particular input currently distributed by PBDAC.

5.28 The second option, in the case of three inputs, (seeds, agricultural machinery, and feed) recommends that privatization be introduced gradually based on slowly increasing geographic areas for privatized distribution.

5.29 The following Exhibit V-1 provides a concise summary of the options recommended for each of the major input categories as recommended in Chapter II of this report.

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CENTER FOR PRIVATIZATION

PRIVATIZATION OF INPUT SUPPLY ACTIVITIES

OF THE

PRINCIPAL BANK FOR DEVELOPMENT AND AGRICULTURAL CREDIT

(PBDAC)

ARAB REPUBLIC OF EGYPT

VOLUME 2

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ANNEX B	PRIVATIZATION OF AGRICULTURAL IMPUTS: ECONOMIC EFFECTS OF THE REMOVAL OF SUBSIDIES AND APPLICATION OF WORLD PRICES
ANNEX C	REPORT OF SOCIOLOGICAL ASSESSMENTS OF INPUT PRIVATIZATION
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CENTER FOR PRIVATIZATION

WASHINGTON, D.C.

APRIL 1989

ANNEX A

FERTILIZER SECTOR REVIEW:

ARAB REPUBLIC OF EGYPT

APRIL, 1989

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ABBREVIATIONS

Organizations and Government Agencies

PBDAC	The Principal Bank for Development and Agricultural Credit
GOE	Government of Egypt
MOA	Ministry of Agriculture
MOE	Ministry of Economy
MOF	Ministry of Finance
MOI	Ministry of Industry
MOS	Ministry of Supply
MOT	Ministry of Transport
ARC	Agricultural Research Center
CIO	Chemical Industries Organization
GAASF	General Authority for Agriculture Price Stabilization Fund
GOFI	General Organization for Industry
NRC	National Research Center

Fertilizer Terms

N	Nitrogen	
P205	Phosphorous Pentoxide	
K20	Potassium Oxide	
CN	Calcium Nitrate	(containing 15.5% N)
AN	Ammonium Nitrate	(containing 33.5% N)
CAN	Cal Ammonium Nitrate	(containing 31% N)
AS	Ammonium Sulfate	(containing 20.5% N)
U	Urea	(containing 46% N)
SSP	Single Superphosphate	(containing 15% P205)
DSP	Double Superphosphate	(containing 37.5% P205)
	(DSP is used to denote domestic TSP)	
TSP	Triple Superphosphate	(containing 44-46% P205)
PS	Potassium Sulfate	(containing 48% K20)
NPK	Mixed Fertilizers	(containing N, P205, & K20)

I. INTRODUCTION

The Egyptian fertilizer sector is characterized by an extreme level of state control, ownership, and regulation. By contrast the sector provides goods and services to the largest private sector in the economy, the 4 million farmers. The control and regulation of the fertilizer sector have been essential elements of the agricultural policy of the Government of Egypt (GOE) since 1952. The policy objectives for the agricultural sector, governed by a restricted land base of 6 million feddans (2.4 million hectares) and a rapidly growing population (2.6% p.a.), have essentially been:

- Increased and sustainable agricultural productivity from the old lands;
- Development of new land agriculture;
- Indirect taxation of farmers;
- A fair distribution of income among farmers;
- A low level of food prices to urban consumers; and
- Increased export income from agriculture with particular emphasis on cotton.

To achieve these objectives governmental intervention has centered on three areas: land reform, output control, and input control. The development of the fertilizer sector has been markedly influenced in all of these areas.

Land reform, stemming from the agrarian land reform legislation of the early 1950's, provided for the break-up of large estates and the allocation of land to the rural landless, control over maximum land holdings per person or farm family and rent control with extended rights of occupancy for tenant farmers. These developments were accompanied by the formation of Agrarian Reform Cooperatives, whose members are farmers allocated land under the land reform legislation. These cooperatives, established in most villages, supplemented the Credit Cooperatives established in the 1930's. Combined with the patrilineal descent inheritance laws, agrarian reform exacerbated the fragmentation of land holdings in the old land areas. This fragmentation of land holdings by individual farmers is an essential feature of Egyptian agriculture that acts as a limitation to the introduction of modern farming technologies and provides in part some rationale for government intervention and control.

Government intervention on the output side has included the imposition of crop rotations on a block basis in the old land areas to ensure the long term fertility of the soil; the cultivation of

basic food grains and cotton; the allocation of irrigation water through complex system of water management; the control of crop output prices and procurement through quota systems; and the transference and redistribution of income from the farm sector to the non-farm sector via price control.

On the input side the GOE has consistently sought to encourage higher productivity at the farm level through the subsidized provision of fertilizers, cotton pesticides, animal feeds, improved high yield varieties of seeds and mechanization. Provision of subsidized short, medium, and long term credit to farmers has been an important ingredient to assist and encourage the increased use of farm inputs. In-kind credit has been used along with crop procurement to enable resource-poor farmers to obtain increased access to farm inputs while ensuring high levels of credit repayment. The GOE has attempted to provide the rural community with a technology transfer system via agricultural research and extension activities to accelerate the rate of change and adoption of new technologies.

This high level of government intervention has led to an extremely complex system of instruments and explicit directives, of inter-ministerial controls, responsibilities and linkages, and counter actions by farmers to circumvent controls and exploit the central planning system to their perceived best advantage. Notwithstanding these constraints this highly controlled system has produced significant advances in farm input use and equity of distribution, particularly with fertilizer, but has failed to sufficiently meet government objectives of increased agricultural production in basic feed grains and cotton for export earnings. As a result the self-sufficiency gap in basic food requirements has continued to grow whilst the nominal cost of input subsidies became a financial annual burden to the Government. Since 1986 the GOE has followed new policy directions aimed at freeing controls and prices of all agricultural output except for cotton, sugar, and rice within the constraints imposed by the fragmentation of landholdings and has commenced a program of input subsidy removal.

Fertilizer procurement and distribution have since 1976 been virtually monopoly functions of The Principal Bank for Development and Agricultural Credit (PBDAC), a state instrumentality within the Ministry of Agriculture (MOA). Domestic fertilizer production has been in the hands of six state-owned companies owned companies since the early 1960's, following nationalization.

Within this context this review is aimed at describing the Egyptian fertilizer sector, with particular emphasis on distribution and marketing, and at examining the options for liberalization, commercialization, and privatization of these functions within the context of assisting the achievement of increased agricultural productivity and equity for the agricultural sector.

II. AGRICULTURAL SECTOR OVERVIEW

Role of Agriculture in the National Economy

Only 4% of Egypt's land area is available for agricultural production, confined essentially to the Nile Valley and Delta. This imposes a severe constraint on domestic food production and total food supplies for the population of approximately 55 million, which is growing rapidly at 2.6% or more per year.

Currently 24 - 25 million people live in the rural areas, of which 4.4 million are employed in agriculture, representing the largest employment sector. In 1986-7 this accounted for 36% of the total labor force and contributed 17% of GDP and 4.5% of export earnings. By comparison, in the mid-1960's agriculture employed 56% of the labor force and contributed 30% of GDP and 25% of export earnings.

In the 1960's government policies were enacted to provide the population with low cost food. While this policy achieved considerable success, compared to many low income countries, in ensuring low cost availability of food supplies, it created a vast and complicated institutional apparatus of central planning, support, and control of both input and output prices for agriculture and food prices for consumers.

This support placed a great financial burden on the government through the subsidization of agricultural prices and foreign exchange expenditures with which to offset domestic supply deficiencies. Food subsidies grew from 1% of GDP in 1970-1 to 8% by 1982-3, representing 13% of public expenditures. With the down turn in foreign exchange earnings in the 1980's, especially from petroleum exports and worker remittances, Egypt faced serious economic problems. A series of economic reforms have been instituted in conjunction with the International Monetary Fund and the World Bank. The economic problem is essentially one of low productivity and inefficient allocation of resources, resulting from government control combined with the high population growth rate.

Instituting these economic reforms within the agriculture sector includes reduction in subsidies and provision of greater private sector involvement. These changes will inevitably lead to increased production costs to farmers and increased food costs to consumers. These implications are of grave concern and represent potential political problems for to the government.

Policy Development

The 1960's were concerned with the GOE's institution of

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policies to develop a comprehensive welfare system designed to provide a minimum living standard to the population. These policies included rigid rent controls, subsidized food commodities and distribution, free education, guaranteed employment for university graduates, and the provision of public services at low costs. For the most part these remain in effect today. The Infiyah or "Open Door" policies of the 1970's were concerned with trying to stimulate the stagnated economy through a series of liberalizations. At this time the industrial sector proliferated, and investment, both public and private, was directed toward non-food production enterprises. Foreign exchange revenues increased from oil, worker remittances, Suez Canal receipts, and tourism. Generally the growth in the economy was used to improve the standard of living and not to develop and strengthen the domestic agricultural production base. During this period agriculture's share of GDP declined from 31% to 17%.

The first Five Year Plan, 1982-1987, focussed on correcting structural imbalances and bringing various sectors into equilibrium. During this period the combination of inflation abroad, a rigid domestic price system, and an over-valued exchange rate caused further distortions in the economy. The main sources of foreign exchange started to decline in 1981, and GDP growth declined progressively until it came to a halt in 1987. Consequent to these events the balance of payments current account deficit rose to 14% in 1986 and the debt service ratio to 47%, while the budget deficit rose to over 23% of GDP.

As it emerged from the first Five Year Plan Egypt was faced with problems of how to establish balance of payments equilibrium at the least economic and social cost, and how to restore an efficient and sustainable growth in an economy severely constrained by lack of resources and a high population growth rate.

The current second Five Year Plan, 1987-8 - 1991-2, has three main strategies:

- Raising Egypt's economic capability to finance its own development and to increase domestically produced goods and enhance export potential;
- Strengthening physical and social infrastructure; and
- Establishing equilibrium between population and location.

Specifically in agriculture, the plan strives to increase production through a number of goals and measures which will lead towards more food self-sufficiency. The goals and measures are to:

- Obtain a sustained 3.7% annual growth in agricultural production through increased yields and land reclamation;

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- Bring the private sector more into agriculture and agribusiness;
- Increase exports;
- Hold food imports down; and
- liberalize prices and controls, and remove subsidies on inputs.

The elements of the first year of the Plan had agricultural targets consistent with prescribed goals. The following tabulation presents the targets and results for 1987-8.

GDP at Cost Factors of Production for the Agricultural Sector (LE millions)

1986-7 Base yr.	1987-8 Expected	Growth Rate % Target	Growth Rate % Expected	% Share of GDP 1986-7	% Share of GDP 1987-8
8640	8903	3.7	3.0	21.1	20.8

The targeted growth was not attained because rice and cotton plantings declined and cotton yields fell as a result of late plantings. The importance of attaining the target growth cannot be over emphasized. Consumer demand for food is outstripping production; and the shortfall needs to be imported but foreign exchange is limited.

Significant changes in production and import policies were made in 1987 and 1988 which allowed farmers more freedom in determining cropping patterns and provided more incentive for growing controlled crops, while a start was made in reducing input subsidies and exchange rates were substantially realigned. To date the impact of these changes has not been significant on crop production, although maize and wheat production have increased but mainly for use as livestock feed. A major constraint is the demand for livestock products and the shortage of feed supplies. The need for fodder production has created a strong local market for fodder, mainly satisfied by production of berseem (Egyptian clover) and fodder by-product production from grain crops. The high value placed on berseem is a major reason why grain production stagnated until prices were decontrolled.

Food Production Capability and Outlook

The net result of the production trends indicated above is a serious deterioration in food self- sufficiency ratios

particularly for wheat. The following tabulation presents some key ratios for 1987.

Self-Sufficiency Ratios of Key Foods 1987

	Production ('000 tons)	Imports ('000 tons)	Consumption ('000 tons)	Production as % of Consumption
Wheat	1,929	6,857	8,786	22
Maize	3,900	2,028	5,928	66
Rice	1,330	-	1,330	100
Beans	282	-	282	100
Lentils	14	15	29	48
Sugar	905	850	1,755	52
Veg Oil	161	474	635	34
Chicken	110	65	175	63
Beef	396	131	527	75

Agricultural Resources

Hydrology

The Nile Valley and Delta form the basis of the water resource and agriculture in Egypt. The agriculture sector is unique with its almost total reliance on irrigation from the Nile. Only a small area of rain-fed agriculture exists on the Mediterranean coastal strip. The perennial system of irrigation began with the construction of the Delta Barrage north of

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Cairo in 1893. This lifted water into irrigation canals for the production of summer crops, expanding the agricultural base from reliance on the annual September flood for winter crop production. The Aswan Dam, completed in 1902 with a storage capacity of 1 billion m3 extended the use of water for summer cropping. The dam was enlarged in 1933, increasing storage capacity to 5.5 billion m3. Additional barrages were built in the Delta at Zifta (1903) and Edfina (1951). Construction of the Aswan High Dam (AHD) (1965) was expected to provide a further 55.5 billion m3 of water for Egypt. Following the decline in reserves in Lake Nasser during 1987-8 the controlled flow of water into the Nile was reduced and is currently set at 52.5 billion m3 per annum.

Use of irrigation water is controlled by the availability of water in the canals. Irrigation rotations of wet and dry periods are used as follows:

Spring (February to mid-April) - 5 days high wet, 5 days low wet, 5 days dry.

Summer (mid-April to mid-August) - 6 days wet, 12 days dry.

During critical summer months the schedules are increased to 7 days wet, 7 days dry. There are special rotations for rice (4 days wet, 4 days dry.)and for vegetables.

Nili (mid-August to December) - 7 days wet, 7 days dry.

During January there is a 10-day period of continuous water flow to flush out canals and ditches followed by a period of keeping the canals dry to facilitate cleaning.

The official irrigation requirements are calculated on the basis of 22,143 m3/ha. for Upper Egypt, 17,381 m3/ha. for Middle and 16000 m3/ha. for Lower Egypt. The water requirements for the main crops vary from 2,309 m3/ha. for broad beans to over 40,000 m3/ha for sugarcane (Table II.1).

Irrigation water has historically been supplied free to Egyptian farmers and is controlled by availability in the canals. Farmers traditionally hoarded water during the flood time and under the seasonal basin system this presented no problem. With minimum control during the delivery periods when water is available in the canals farmers still tend to apply excessive amounts.

Controlled water release allows the cultivation of two or three crops per year. This in turn has increased those problems associated with excessive water use. Waterlogging and salinity problems affect up to 80% of the irrigated land.(Stone & Webster, Kima Fertilizer Study,1985)

A 30-year program commenced in 1960 to improve drainage throughout the Nile Valley and Delta. The system is basically one of installing tile field drains. Evidence in the 1970's suggested that waterlogging and salinity were accelerating at a pace faster than the provision for drainage. Improved efforts are now being made to speed up the provision of drainage and improve the water management practices of farmers. Over-watering and poor water management by farmers remain very real problems.

Soils

Egypt is essentially divided into three broad geographical areas: the Nile Valley and Delta; the Eastern Desert and Sinai; and the Western Desert. The predominant agricultural production area in the country, about 93% of total, is located in the Nile Valley and Delta with some new lands under cultivation in the Western Desert.

The soils of the Nile Valley and Delta owe their origin to the Nile River. Before construction of the Aswan High Dam, the Nile carried an estimated 110 million tons of suspended matter per annum, of which 3.8 million tons were deposited on the basin lands in Upper Egypt; 3.7 million tons on irrigated lands in Middle Egypt, and 0.5 million tons on the Delta. The remaining 94 million tons passed into the Mediterranean Sea (Kima Fertilizer Study, 1985). These alluvial soils are for the most part level, deep, dark brown, heavy to medium in texture. The sediment deposits consisted of 55% - 64% clay (montmorillionite, kaolinite, and illite), 25% - 30% silt, and 6% - 15% fine sand. The organic matter varied from 2.3% - 4.5%. The flood waters carried approximately 200 ppm of soluble salts, mostly bicarbonates and sulfates of sodium, magnesium, and calcium. After construction of the AHD the composition of the water changed, with the amount of soluble salts falling significantly. These old land soils are formed on a dark brown clay, varying in thickness from about 6.7 m at Aswan to 8.3 m in the Middle and Lower Valley. The clay cap overlies coarser deposits of older age, which in turn cover still older alluvial deposits of gravel. The Nile Valley in both Upper and Middle Egypt is surrounded on both sides by a series of gravel and sand terraces of different ages.

Extensive soil mapping has been conducted in the Nile Valley since 1953.A MOA soil map showing soil associations, as adopted by the FAO and UNESCO Soil Map of the World, is shown in Exhibit II-1. Most of the cultivated old lands are classified as Eutric Luvisols. Most of them are not excessively saline except for areas in the north and close to the main irrigation canals. They have a base saturation of 50% or more. All of these soils have a basic reaction and approximately 50% require saline soil management practices due to the level of soluble salts.

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Table II-2 shows agricultural land by classes by major agronomic zones. Class II is the largest class with 46% of the total. Class III land accounts for a further 39%, while Class I and Class IV make up 6% and 9%, respectively. In the new land areas 25% is in Class III and 2% is in Class IV.

Organic matter levels are generally low but have been modified to some extent by manure applications. Organic nitrogen levels are also low, and nitrogen deficiency is widespread, representing the major nutrient deficiency. Calcium carbonate has a pronounced effect on the availability of phosphorus because of the formation of insoluble or slowly soluble calcium phosphate compounds. In the calcareous soils available phosphate levels are very low and responses to soluble phosphate fertilizer are widespread. Potassium levels are generally adequate in the alluvial soils, but deficiencies are prevalent in the calcareous and sandy soils. Sulfur responses have not been recorded.

Calcium carbonate plays an important role in the chemistry of soils because of its direct effect on pH. High pH decreases the availability of micronutrients such as iron, manganese, copper, and zinc. Responses to these micronutrients are common in Egyptian soils. Table II-3 illustrates the range of micronutrient availability for four major soil types. Availability is related to organic matter, clay and calcium carbonate content as well as the mineralogy and soil pH.

Following construction of the AHD the loss of sediments reduced the the annual addition of plant nutrients. The sediments were estimated to be approximately 1,700 tons N, 7,000 tons P205, and 6,000 tons of K20 per annum. Organic matter losses were greater but less than 6% of the estimated 5.6 million tons of organic matter contained in the 70 million tons of animal manures that are annually added to the cultivated area.

The new lands contain only small areas where soil fertility levels are comparable to those in the Nile Valley and Delta. The majority of the areas already reclaimed and planned for reclamation are coarse, poorly structured sandy soils with chronic deficencies of the major and micro plant nutrients and organic matter.

The total area of old lands is 5.8 million feddans (2.44 million hectares), but it is estimated that approximately 20,000 feddans per annum (8,400 ha.) are being lost to urban development. By 1982 the Ministry of Irrigation (MOI) had reclaimed about 1.03 million feddans (433,000 ha.) and implemented a plan to reach about 3 million feddans(1.26 million ha.) by the year 2000. Much of the land reclamation to date has not been fully utilised.

Land Reclamation

The Ministry of Irrigation (MOI) is responsible for the development of water resources and as such plays a key role in land reclamation. The main activities of MOI with regard to land reclamation are establishing and maintaining the water distribution systems to the new land areas as far as the main branch canals and drains. The Ministry of Land Reclamation (MLR) has responsibilty for implementing reclamation of new lands beyond these points. MLR responsibility includes provision for infrastructure, housing, and agriculture.

The dominant method for implementing the reclamations has been through state owned farms of considerable size 5,000 to 30,000 hectares. Reclamation costs are considerable, ranging up to $14,000 per feddan. A policy of full development cost recovery is adopted and selling prices in 1981 were equal to US $12,000 - $14,000/ha., inclusive of infrastructure, center pivots, and water piping, (Stone & Webster,1985). Some areas of smaller farms of approximately 8 ha.(20 feddans), without irrigation systems and developed beyond branch channels, have sold for US $11,700/ha.(LE 12,000/feddan) in recent years.

Most of the new land areas, because of the coarse sandy soils, are developed for sprinkler or drip irrigation rather than the traditional basin flood irrigation used in the old lands. The lower fertility and productivity of these new lands compared to the old lands is offset to a large extent by the economies of scale allowing increased mechanization and the lower capital cost of land. Old lands are currently valued at between LE 20,000 and 30,000 per feddan(US $19,500 - $29,200 per hectare),depending on location,soil type, and development. In spite of this situation in the late 1970's only 60% of the reclaimed land was cultivated and less than one third was profitable (Stone & Webster,1985). In part this appears to be due to the lack of management technology and skill, and the considerable time required to bring these soils up to reasonable levels of productvity. This development time may be as long as 15 years.

During the current Five Year Plan it is intended that a further 52,600 ha. (125,000 feddans) will be reclaimed each year. The GOE also recently announced (Febuary, 1989) its intention to reclaim up to 2 million feddans(874,000 ha.) for wheat production along the north coastal zone.

Climate

Extending south from the 32 nd. parallel to below the Tropic of Cancer, Egypt has a warm, arid climate with a relatively cool winter from November to April and a hot summer from May to October. Winter temperatures in Cairo normally range between 4° C 18° C;

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summer temperatures between 21° C and 37° C. In Upper Egypt the winters are mild: maximum temperature ranges from 20° C to 24° C and minimum tenmperatures are around 5° C to 9° C. Summers are hot in daytime and warm at night, with maximum temperatures from 36° to 42° C, and minimums from 20 to 26° C.

Rainfall is almost entirely limited to the northern coastal area, where it averages 21 centimetres a year. South of Cairo, where annual rainfall averages 2.5 centimetres, precipitation drops to almost zero.

Agroclimatic Zones

The agricultural areas of Egypt are divided into 14 major agroclimatic zones as follows:

I	Northern Delta Rice Zone
II	Southern Delta Zone
III	Cairo Vegetable Zone
IV	Western Border Zone
V	Eastern Border Zone
VI	Mid-Egypt Zone
VII	El Fayoum Zone
VIII	Upper Egypt Zone
IX	El Husseinya Zone
X	West Zone
XI	New Valley Zone
XII	West Mediterranean Zone
XIII	Sinai Zone
XIV	Lake Nasser Zone

The locations of these zones are shown in Figure 2.2.

Agricultural Land Use Constraints

Obviously the over-riding constraint to agricultural land use is the absence of rainfall and the restriction of agriculture to the irrigated lands. Within the old lands area of the Nile Valley and Delta available irrigation water is currently not a significant constraint, but water management and the associated problems of drainage and increasing salinity are. Low soil nitrogen levels, widespread phosphate deficiency and Zn, Mn, Fe, and Cu deficiencies are the major soil nutrient constraints. There is mounting evidence of increasing areas of potassium deficiency.

In the new lands similar soil nutrient deficiences exist but to a much greater extent and degree. In addition, infrastructure and technological expertise to exploit the potential productivity,

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are currently inadequate.

Farming Systems

Rotations

The agricultural year starts in October and consists of three cropping seasons: winter, summer, and Nili (fal). Since irrigation water is available all year round, continuous cropping is the general rule throughout the country.

There are a number of different crop rotations based on the traditional crops of cotton, rice, and maize for the summer; and wheat, berseem clover, and beans for winter. In Upper Egypt sugarcane replaces cotton and rice as the main summer cash crop. Typical traditional rotations representative of the major cropping zones are shown in Table II-4. for the Governorates of Dakalia, Menufia, Beni Seuf, and Qena.

Fruit trees are permenant crops and sugarcane is ratooned two to four times. Cotton, preceded by a catch crop of berseem or winter vegetables, results in the land being occupied throughout the year. One or two cuttings of the clover are taken prior to the ploughing under of the clover for the cotton. If the berseem is kept for 3 or 4 cuttings it is followed by a shorter season summer crop than cotton. Winter field crops frequently occupy a larger percentage of the land than do summer field crops, but each crop requires 4-6 months of land use except for the short season Nili crops. Summer vegetables occupy more area than either winter or Nili vegetables. Usually at least 3 vegetable crops can be grown per year.

Over the past 20 years there has been a trend of declining Nili field crops and an increasing area of vegetables. Accompanied with the introduction of shorter season field crop varieties, this has increased the cropping intensity from around 1.7 crops per cultivated feddan per annum to approximately 2 crops per annum. This increasing trend towards greater cropping intensity appears to be a major avenue for farmers to increase output and farm incomes.

The traditional crop rotations cited above are sometimes varied in the cotton areas to a two-year rotation in which half the farm rather than one third is cropped to cotton. Whatever rotation is practiced, it has to be appreciated that the main summer crop dictates the rotation, both in terms of cropping intensity and crop pattern.

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Farmer Profiles

There are approximately 4 million farm holdings in Egypt. The vast majority are small fragmented farms of less than 3 feddans. These private sector small farmers occupy about half the total cultivated area, with a further 30% of the land held by farmers with between 3 and 10 feddans. The remaining 20% of the land is held by only 2% of the farmer population, with holdings greater than 10 feddans. This latter segment includes state farms, both military and public sector companies, and include very large land holdings, particuarly in the new land areas.

While the above comments are based on 1977-8 data it is doubtful whether the situation has materially changed since then. Details of farm size distibution are provided in Table II-5.

Landholding patterns were significantly changed by the Land Reform Act, No. 178 of 1952. As a result of this act large landholdings were broken up and land redistributed among landless villagers. Originally no one family was allowed to hold more than 200 feddans but this was subsequently altered to 200 feddans per person in the private sector. Legal tenure of rented land was also given by the Land Reform Act. Originally lease contracts were for 3 consectutive years but were subsequently extended indefinitely, thereby preventing landlords from substituting tenants or regaining full rights of ownership and use. The Land Reform Act also set a rent formula which has remained unchanged. This formula sets maximum rents at no more than 7 times the Land Tax, currently LE 8 / fd.. Current maximum rents are thus LE 56 / fd. for land which is valued at between LE 20,000 and 30,000 / fd..

A survey of 3 Delta villages in Sharkiya, Dakhaliya, and Gharbiya governorates, (Commander,1987), provided some information on landholding size distribution and ownership in 1984, (Table II-6.). In all 3 villages over 90 % of the farm holdings were under 3 feddans and in the larger villages between 25 % and 80 % of these small farms were rented. In the small villages, in Gharbiya governorate, most of the land was owned by farmers. These 3 villages surveyed were fairly typical of the range found in the Egyptian village structure. Farmers live in the villages, which have a high population density, and farm the surrounding land. The largest village in Dakhaliya governorate had a total population of 21,000 while the smallest of the three in Gharbiya had only 2,500 people. These villages varied considerably in the facilities provided. Table II-7 illustrates this range. There are approximately 4,500 villages in Egypt.

Commander (1987) concluded that small farms' production and marketing strategies are not strictly determined by the aim of maximizing food consumption requirements. Reasons for this include not only the forced deliveries of controlled commodities but also an increasing bias to livestock production and the marketing of

berseem output, marketing of traditional food crops even at the smallest farm level, and the availability of subsidized food distributed through the consumer co-operatives and ration shops.

The fragmented nature of even the smallest holdings is a considerable deterrent to increased mechanisation. Enforced crop rotation control by blocks is a method used by the GOE to enable mechanization techniqes for cultivation, pest and weed control, and harvesting. For most farmers mechanization is limited to irrigation pumps, hand or back-pack sprayers, and access to private or government tractors.

Government Controls

The agricultural sector continues to be one of the most intensively controlled sectors in the Egyptian economy, in spite of recent policy changes designed to reduce this control. The agricultural control system has three main elements:

- Control of cropping patterns;
- Control on input use and availability; and
- Control on marketing.

Prior to 1986 these controls were pervasive and designed to ensure a minimum supply of basic commodities to government marketing channels. Since 1986 these controls have been in theory lifted from all commodities except cotton, rice, and sugar.

Control of the Cropping Pattern

Control is excercised through the block system, under which certain areas were set aside each year for the controlled crops, basically cotton, rice, and wheat. Sugarcane controls are implemented separately through the sugar mills. In 1986 wheat was removed from the control system and changes made to the rice controls. The blocks are rotated through the agricultural area in line with established 2 or 3-year rotations. Various blocks in a village rotate between cotton and other crops and this sets the whole pattern of cropping for each village, since technical factors and seasonal timing considerations limit the crops that can be grown before and after the controlled crops. When a given block is scheduled for cotton, any farmer whose land falls within the block must plant cotton on that area. Failure to do so results in fines or lack of access to subsidized inputs or credit. The block system is also a technical measure. Blocking cotton is necessary to facilitate crop spraying, for example, and controls on rice and sugarcane areas serve to control the allocation of irrigation water.

The block system is implemented by MOA through the national cooperative system, with support from PBDAC in the following ways:

1. Each year production targets for each of the controlled crops are set at the national level by a committee chaired by the Minister of Agriculture.

2. These targets are translated into governorate, district, and village targets, which are communicated to the cooperative manager and MOA engineer (extension officer) in each village.

3. The cooperative manager assigns blocks to the controlled crops to meet the target, making such adjustments as are necessary to meet local conditions.

4. The proposed rotations and crop areas are aggregated back up the system to form the official plan. This forms the basis for allocating inputs to each village and farmer.

5. Each farmer is provided with a farm notebook in which details of land ownership, farm area, approved cropping plan, and input entitlements are entered by the MOA extension agent.

6. The cooperative manager provides the PBDAC village bank with a list of farmers showing the area to be planted to each controlled crop and other crops.

It is the cooperative manager who is responsible for policing the rotation and assigning fines to violators. However, the cooperative manager, the village bank manager, and the extension agent of MOA all work out of the same government office building in most villages and to all intents and purposes may appear to farmers to constitute a single system.

The controls on cotton are the most stringent; not only areas but also varieties, planting dates, and management practices are controlled by various means of coercion, fines for non- compliance, or withdrawal of access to subsidized inputs.

The controls on rice are now related more to the delivery of a set quota of production per feddan rather than a strict area quota. Currently farmers growing rice in the block system have to deliver 1 ton of paddy per feddan of their official area allocation to the rice mills. This represents approximately half the normal production. Any production over this amount farmers are free to sell on the open market.

It is generally believed that due to the lower profitability of the total rotation that arises from the imposition of cotton area allocations (cotton occupies the land for 7-8 months and

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reduces the cropping intensity) that many farmers attempt to circumvent the regulations. Anecdotal reports of farmers' inter-row cropping with more profitable vegetable crops in cotton areas and paying fines rather than complying with the area allocations were made to the study team, as well as reports that smaller areas of rice than the official allocations are being grown, to comply with the quota deliveries and allow the additional areas to be cropped more profitably. It was claimed from several sources that in the new land areas the areas on individual holdings are not accurately recorded and that farmers wishing to obtain larger allocations of subsidized inputs do not grow the official areas allocated to, or recorded as being grown by, them. By this means farmers can obtain sufficient subsidized fertilizer for the less fertile land.

Crop Production Trends

Total cultivated area has been increasing slowly during this decade from 5.8 million feddans in 1980 to an estimated 6.09 million in 1987-8. The most significant changes in crop areas have been the decline in cotton, maize, and wheat and the upsurge in vegetables and berseem as shown in the tabulation below.

Crop Area Trends, 1980 - 1988 (million feddans)

	1980	1984	1986	1987	1988
Total Cult. Area	5.819	5.907	6.044	6.075	6.090
Wheat	1.326	1.178	1.206	1.373	1.422
Maize	1.924	1.975	1.483	1.353	1.480
Rice	0.972	0.985	1.055	0.980	0.837
Cotton	1.245	0.984	1.055	0.980	0.837
Sugarcane	0.252	0.244	0.262	0.250	0.280
Vegetables	0.695	0.674	1.018	1.024	1.249
Berseem(full)	1.722	1.972	1.865	2.000	2.100
Major Fruits	0.303	0.362	0.429	0.435	0.450

Source: 1980-1986 MOA: 1987 and 1988, Capmas,1988,MOA/AES unpublished data.

The major vegetable crop is tomato. This accounts for slightly over 400,000 feddans or almost one third of the total vegetables.

Major crop yields per feddan during the 1980's exhibited a static or declining trend. In the tabulation below cotton yields in particular show a significant decline, but all may not be as it

seems. It was reported to the Study Team that farmers often only carry out one cotton picking and then plough out in order to get in another more profitable crop. The extent to which this practice is common and its effect on recorded yields are not known.

Major Crop Yield Trends, 1980 -1988

(tons/feddan)

	1980	1984	1986	1987	1988
Wheat	1.38	1.54	1.6	1.6	1.98
Maize	1.92	1.97	2.11	1.96	1.96
Rice	2.46	2.27	2.43	2.46	2.31
Cotton	1.13	1.06	1.03	1.03	0.97
Sugarcane	34.14	37.41	39.86	38.70	33.70
Tomatoes	NA	9.90	11.02	NA	NA
Oranges	NA	7.30	6.3	NA	NA

Source: 1980-1986 MOA; 1987 and 1988, Capmas; 1988, MOA/AES, unpublished data.

Agricultural Support Services

Agricultural Research

There are six areas of research activities that are relevant to the fertilizer sector. These are the Agricultural Research Center (ARC), and the Horticultural Research Department of MOA, the National Research Center, and the Research and Development Department of the General Authority for Agriculture Stabalisation Fund (GAASF), the Sugar Research Institute, and the universities.

The ARC was primarily concerned with research until the early 1980's but in an effort to better link research and extension activities it acquired the central extension service of MOA. Currently it has an annual budget of LE 80 million, of which over LE 50 million is spent on salaries and wages. Staffing of 5,000 is divided into 2,000 engineers, 2,000 extension personnel, and 1,000 others. In reality for every research worker there are approximately 15 assistants.

ARC research has been primarily concerned with the major field crops, except sugar, and there has been little work on farming

systems. In addition a major area concerns plant breeding and seed production. ARC has 5 main research stations, including Giza, and 20 sub-stations located throughout the country. Each of these research stations has an annual open day and in addition there are other field days held for the major crops. In 1988 there were 170 wheat field days, held at district level in the governorates, 1 field day in each governorate for cotton, and 5 governorate field days for rice.

ARC was closely involved with the Egyptian Major Cereals Improvement Project and the Rice Research and Training Project, which were both designed to close linkages between research and extension for specific commodities. The success of these programs can be judged to some extent by the increase in wheat yields nationally from 1.4 tons/fd. in the mid 1970's to around 2 tons/fd today.

Currently moves are in hand to bring the governorate level MOA extension service under the control of the ARC.

The National Research Center in Cairo is not primarily concerned with agriculture but does conduct research into soil fertility with particular emphasis on micronutrients and has an active soil analysis laboratory.

The horticultural branch of MOA is responsible for all research and fertilizer recommendations for horticultural crops, as is the Sugar Institute for sugarcane.

Within the GAASF some research programs are investigating production processes and new products for the fertilizer industry.

In addition to this institutional research there are about six private sector companies involved in agricultural research, activities including the Pioneer Seed Company and Ciba Geigy.

Extension Services

In addition to the national extension programs of the ARC the MOA Extension Service operates at all levels with some 7,000 extension workers. Almost without exception every one interviewed by the study team was critical of this service. The major problems are reported to be lack of training and funds, inadequate salaries and facilities, and a mixed role of extension and administrative duties. A major program, the NARP project funded by AID is designed to improve this situation and seeks a revitalisation of the failed programs of the early 1980's.

The Small Farmer Production Project was a successful extension project conducted within PBDAC, in which information was delivered to the farmer as part of an in-kind credit package. This is now

being extended through the Agricultural Production and Credit Project (APCP) to 12 governorates.

It is apparent that research results and field technology are available to substantially improve the productive performance of Egypt's farmers, but the lack of adequate, workable transfer mechanisms is preventing the adoption of new technologies. In addition the compartmentalization of research and extension is hindering the whole-farm approach to sound farm management practices. This is compounded by inappropriate pricing and subsidy policies.

Agricultural Output Marketing

Marketing Systems

Until the recent liberalization of cropping controls the marketing of the controlled crops was a joint operation between PBDAC and the cooperative system. The cooperatives and the village banks set up receiving depots for the crops at Mandubias and shounas where the crops were graded, weighed, and paid for, deducting outstanding loans. Typically the controlled crops remained under the cooperative system while the other quota crops and seeds were purchased by PBDAC on behalf of other government agencies.

Under the new system where only cotton and rice are controlled, farmers are free to sell all other crops to the private sector, but PBDAC remains as a buyer of last resort with what are essentially floor prices set by the government. In the case of feed grains PBDAC competes with the private sector for the purchase of grain for the public sector feed mills.

The marketing of cotton remains fully controlled, and for rice farmers have to provide 50% of output to PBDAC and are then free to sell the remaining output at market prices.

Sugarcane marketing remains under the total control of the sugar mills at set prices.

Farm Prices

Prior to 1986 and the relaxation of controls farm commodity prices were held at low and stable levels. With the advent of free market prices, decontrolled crop prices increased sharply and these were accompanied by increases in controlled crop prices as shown below.

Average Farm Prices for Major Crops, 1983-4 - 1988-9

(LE / ton)

Year	Cotton	Rice	Wheat	Maize	Sugar
1988-9	1,100	275	290	360	40
1988-8	952	250	251	321	34
1986-7	727	203	200	255	30.5
1985-6	582	175	166	148	30.5
1984-5	358	168.5	148	148	24,2
1983-4	358	117.6	148	148	24.2

The controlled price for rice in 1986-7 and 1987-8 was LE 200/ton, applicable on 50% of the output.Cotton prices are for unginned cotton.

In spite of the price increases for controlled crops the profitability of cotton, especially when calculated on a monthly basis, is still well below that of other crops even taking into account the high degree of subsidization applicable to production costs.

Agricultural Credit

The agricultural credit system is administered by PBDAC in three ways: the provision of short term crop credit, provision of credit for farm machinery and equipment and other medium term loans, and long term development credit. PBDAC provided over 70% of official agricultural credit in 1987-8, including LE 693 million in short term seasonal credit and LE 1,600 million in short, medium, and long term investment credit. The short term seasonal credit is usually supplied as subsidized in-kind credit and is an integral part of the input supply and control activities of PBDAC.

Once a farmer has an agreed cropping program, this is entered in the farm notebook, which records total area, ownership, cropping areas, and the allocated inputs for each crop. The farmer is then entitled to the given quantities of inputs from PBDAC either for cash or in kind. There are three types of seasonal loans: winter crop, summer crop, and nili crop loans. Winter crop loans are available from October 1 and have to be repaid by April 1, or before further credit is extended, and are charged at 3.5% interest. Summer crop loans are available from March 1, repayable within seven months, and charged at 4% interest. Nili crop seasonal loans are of short duration from July until October and attract interest at 2.5%. PBDAC receives a subsidy on the interest charged after procuring funds from commercial banks.

Loan repayment is virtually ensured for these cropping loans

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because farmers are unable to obtain subsidized inputs from any other source and non-repayment means loss of access to these inputs; additionally, the Bank is able to deduct loans from crop produce sales to the Bank. As a result repayment rates run as high as 98%. In 1987-8 75% of fertilizer credit was provided on an in-kind basis. Generally the inputs are provided in kind and field operating costs such as labor for harvest are advanced as cash loans. Approximately 50% of all seasonal credit is in cash advances.

Undoubtedly this system has provided the means for resource-poor farmers to obtain access to needed inputs, but there are several shortcomings. Although the official policy is that farmers do not have to take the complete package of inputs recommended, in practice considerable pressure or even coercion is placed on farmers by the village banks on the basis that credit is available only for the complete package. The package of inputs is not provided completely at the start of the cropping season. Farmers have to go to the village bank several times to receive cash advances and inputs and then pick up the inputs as required from the mandubias. This can be a very time consuming process and is indicative of the way in which the interest of PBDAC takes priority over that of the farmer.

Table II-1

Water Requirements of Main Crop Plants (m3/ha)

Crops	Middle Egypt	Upper Egypt
Winter Crops		
Berseem (full season)	5,653	8,952
Berseem (catch crop)	3,674	3,274
Wheat	2,929	4,024
Barley	3,071	4,238
Broad Beans	2,309	3,190
Summer Crops		
Cotton	9,000	12,548
Rice	20,952	-
Maize	6,952	9,762
Sugarcane	26,190	40,476
Nili Crops		
Maize	6,476	8,929

Source: El-Togby, Contempory Egyptian Agriculture, 1976

Table II-2

Old Lands in Cultivation:
Soil Classes by Agronomic Zones

Zone	Soil Class I	II	III	IV	Total
	('000 feddans)				
I	9	419	980	221	1,629
II	85	545	340	51	1,021
III	73	203	102	18	396
IV	-	19	102	40	161
V	3	77	80	14	174
VI	116	719	214	56	1,105
VII	10	62	188	55	315
VIII	37	535	143	53	768
IX a/	-	5	50	33	88
Total	333	2,584	2,199	541	5,657

a/ El Husseiniya District only for old lands.

Table II-3

Range of Available Micronutients in Egyptian Soils[a/]

Soil	Zn	Mn	Fe	Cu	B
	ppm				
Alluvial	1.9 - 3.8	132 - 350	2330-3165	2.7-3.8	0.04-0.22
Calcareous	0.9 - 2.85	12 - 27	750- 950	1.0-1.48	0.01-0.16
Lacustrine	1.05- 2.06	36 - 43	965- 975	1.02- 1.3	0.06-0.23
Sandy	0.45 -1.65	22 - 39	855 -944	0.40-0.89	0.03-0.17

a/ All values, except B, were obtained using EDTA hot water extract.

Source: National Research Center, Cairo, 1980.

Table II-4

Traditional Crop Rotations

Dakalia

	Oct. Winter	Mar. Summer	Sept.
Year 1	Short Berseem ///////	////Cotton //////////////	
Year 2	Long Berseem 2/3 Beans 1/3	Rice	
Year 3	Wheat 1/3 Berseem 2/3	Maize	

Menufia

	Oct. Winter	Mar. Summer	Sept.
Year 1	Short Berseem ///////	////Cotton //////////////	
Year 2	Long Berseem 2/3 Beans 1/3	Beans	
Year 3	Wheat 1/3 Beans 2/3	Maize 2/3	Tomatoes 1/3

Beni Seuf

	Oct. Winter	Mar. Summer	Sept.
Year 1	Short Berseem ///////	////Cotton //////////////	
Year 2	Garlic1/3Beans1/3Berseem1/3	Maize	
Year 3	Wheat 1/3 Beans 2/3	Maize 2/3	Tomatoes 1/3

Qena

	Oct. Winter	Mar. Summer	Sept.
Year 1	Sugarcane Wheat Berseem	Sugarcane Sorghum Maize	
Year 2	Sugarcane Beans Berseem	Sugarcane Sorghum Maize	

Table II-5

Distribution of Landholdings by Size, 1977-8

Farm Size (Feddans)	Number of Holdings	%	Area (000 Feddans)	%
0 - 1	1458.8	48.8	919.9	15.0
1 - 3	984.3	32.9	2017.4	33.0
3 - 5	348.7	11.7	1165.6	19.1
5 -10	127.6	4.2	785.9	12.9
> 10	69.9	2.3	1226.9	20.0

Source: S. Commander, The State and Agricultural Development in Egypt Since 1973. 1987.

Table II-6

Distribution of Landholdings, 1984,
For 3 Delta Villages

Farm Size	Number	%	Area	%	Rented Area %
		SHARKIYA			
0 - 1	721	55.6	405.22	21.9	48.9
1 - 3	487	37.5	891.05	48.1	32.5
3 - 5	43	3.3	143.19	7.8	2.7
5 -10	34	2.6	236.09	12.8	0.8
> 10	12	1.0	174.11	9.4	-
		DAKHALIYA			
0 - 1	1066	64.9	481.13	27.5	13.7
1 - 3	494	31.3	798.06	45.5	14.8
3 - 5	48	2.9	168.02	9.6	19.1
5 -10	27	1.6	163.11	9.3	49.7
> 10	9	0.2	141.11	8.1	32.9
		GHARBIYA			
0 - 1	158	70.5	79.09	39.1	1.5
1 - 3	59	26.3	88.19	43.7	3.6
3 - 5	4	1.4	13.17	6.7	-
5 -10	3	1.4	21.04	10.5	-
> 10	-	-	-	-	-

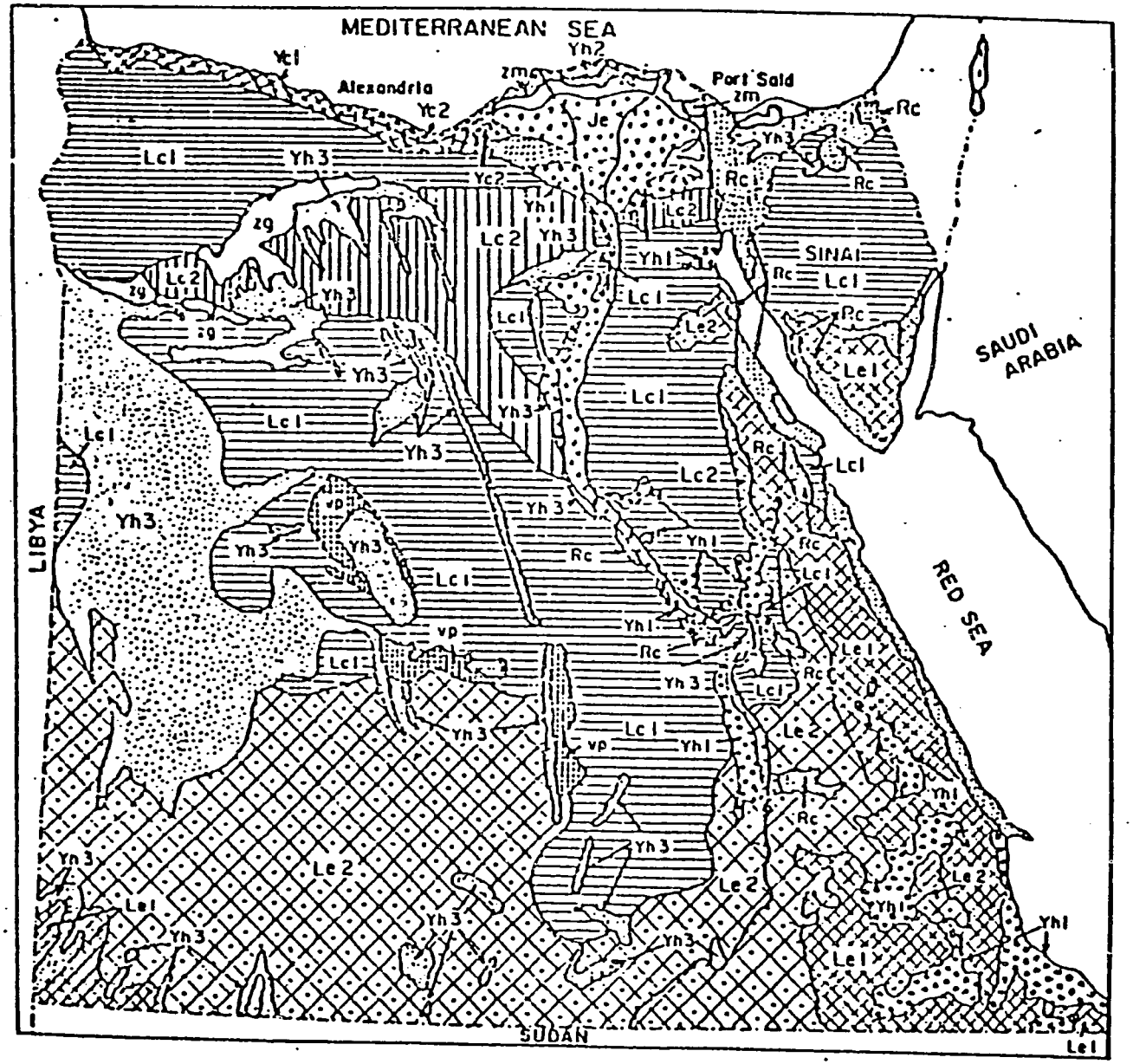
Source: S. Commander, The State and Agricultural Development in Egypt Since 1973. 1987.

Table II-7

Summary Characteristics of Sample Villages

Village	Sharkiya	Dakhaliya	Gharbiya
Population	14,000	21,000	2,500
Landholders	1297	1644	234
Total area(fd.)	1851.7	1753.8	203.4
Av.Holding	1.43	1.07	0.87
Landless households	370	235	25
Retail shops	8	23	6
Coops - Consumer	Yes	Yes	Yes
- Agrarian Ref.	No	No	No
- Credit	Yes	Yes	Yes
Credit Bank	Yes	No	No
		(Nearest 2km)	(Nearest 3km)
Ag. Extension Officer	No	No	No
Hospital	No	Yes	No
Schools	Yes	Yes	No
Veterinary Station	Yes	No	No
Schools	Yes	Yes	No
Paved Road	Yes	Yes	No
Bakery	Yes	Yes	No
Gov't Machinery Station	Yes	No	No
Machinery Repair Shops	1	No	No

Source: S. Commander, The State and Agricultural Development in Egypt Since 1973. 1987



LEGEND

FLUVISOLS
- Je — EUTRIC FLUVISOLS

SOLONCHAKS
- zg — GLEYIC SOLONCHAKS
- zm — MOLLIC SOLONCHAKS

VERTISOLS
- Vc — PELLIC VERTISOLS

RHEGOSOLS
- Rc — CALCARIC RHEGOSOLS

YERMOSOLS
- Yh — HAPLIC YERMOSOLS
- Yh1 — GRAVELLY
- Yh2 — SILIC SEMISTATIC
- Yh3 — SILIC DYNAMIC
- Yc — CALCIC YERMOSOLS
- Yc1 — STATIC
- Yc2 — SEMISTATIC

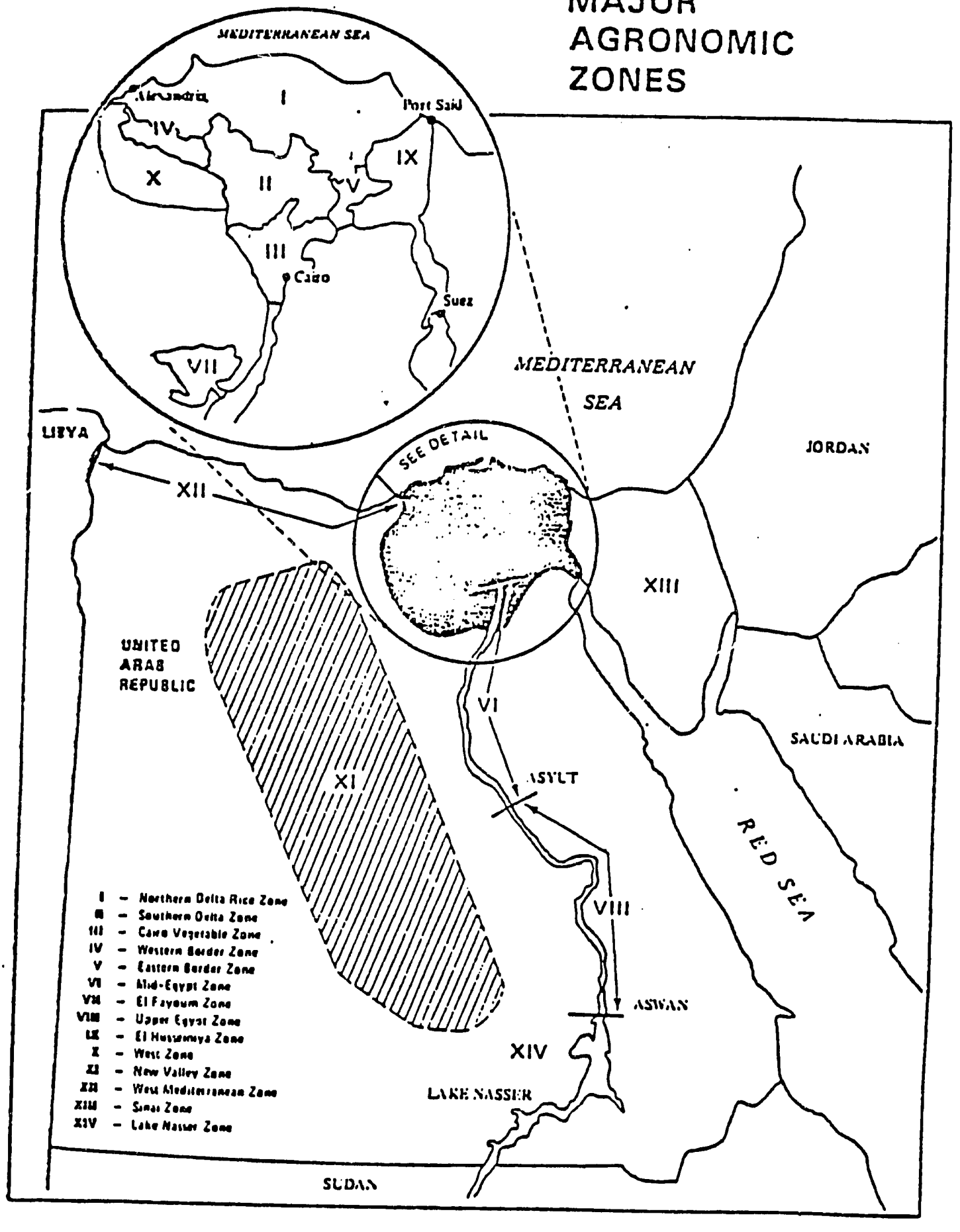
LITHOSOLS
- Le — EUTRIC LITHOSOLS
- Le1 — IGNEOUS AND METAMORPHIC
- Le2 — SANDSTONE
- Lc — CALCARIC LITHOSOLS
- Lc1 — LIMESTONE
- Lc2 — CALCARIC LIMESTONE AND YERMOSOLS

Exhibit II-1
Egyptian Soil Types

Source: Soil Survey Division, Ministry of Agriculture.

Exhibit II-2

MAJOR AGRONOMIC ZONES



Source: USDA Foreign Economic Report, #120, 1976.

III. FERTILIZER SUPPLY

Raw Materials

Egypt is well endowed with raw materials for the manufacture of nitrogenous and phosphatic fertilizers. It is a policy of the GOE to utilize the indigenous resources to the extent that investment capital is available. All raw materials for fertilizer production are in the control of the public sector, whether indigenous or imported.

Indigenous Raw Materials

Natural Gas. Natural gas is the most efficient feedstock for ammonia production. Egypt has large reserves of natural gas and is a net exporter of hydrocarbons, including fuel oil. Recoverable resources of natural gas are estimated at about 9.3 trillion standard cubic feet (SCF) including about 2.3 trillion SCF of associated gas. Utilization of these resources commenced in 1978, and at the current annual production of 194 billion SCF recoverable reserves would be sufficient for around 50 years. The GOE is giving high priority to the use of natural gas in process industries, such as chemicals and petrochemicals, where the value added is high.

The main natural gas sources are located at Abu Madi, Abu Qir, Abu Gharadig, and Ras Shukeir (the Gulf of Suez). Gas production at the first three locations commenced in 1978-9, and these production sites were joined by production from the Gulf of Suez in 1982-3.

Four of Egypt's six nitrogen fertilizer complexes use natural gas, while the remaining two - Kima and Helwan - use less efficient feedstocks, namely electrolysis and coke-oven gas respectively. It has recently been announced that the Kima plant feedstock will be changed to fuel oil.

Phosphate Rock. There are large phosphate rock deposits at Abu Tartour in the Western Desert, which are currently under development, and smaller deposits at the Gulf of Suez and West Sabaya in Upper Egypt, which have been exploited for some years. The GOE's plans in recent years have been to develop indigenous resources and manufacture phosphate fertilizers, of which there has been no importation since 1985.

Total phosphate rock production in recent years has increased considerably, as shown in Table III-1 to almost 1.3 million tons in 1986. The utilization of this rock production commenced in 1951

with the production of single superphosphate at Kafr el Zaiyat, followed by further single superphosphate production at both Assyut and Abu Zaabal and since 1984 by triple superphosphate production at Abu Zaabal. Low rock quality has been a continual source of difficulty in producing both single and triple superphosphate with on-specification levels of water soluble P2O5.

The most important potential resource for phosphate rock in the future is the deposit at Abu Tartour in the Western Desert. This deposit is large, with reserves estimated at over 600 million tons. Progress is being made to develop infrastructure, particularly a rail link, port facilities, and power supply to the area. Though the final configuration of the development has not been established, or indeed the decision to go ahead, it is expected that development of the project will lead to production of around 2 million tons per annum of processed concentrate with approximately half to be utilized domestically and half exported.

Sulfur. There has been no domestic production of sulfur since the 1960's when commercial scale working ceased on the deposit at Ras Gemsma on the Red Sea coast. However, it is known that sulfur-bearing mineral resources exist in the country and that Freeport Sulfur Co. has an exploration and development concession covering 1,250 sq. km. in northern Sinai. Exhibit III-1 shows the location of raw material resources for phosphate and sulfur.

Potash. There are no exploited potash deposits in Egypt but it is believed that some consideration is being given to investigating the possibility of developing potash production from evaporative concentration and separation of salts from marine lakes.

Imported Raw Materials

Imports of raw materials for fertilizer production are limited to sulfur. This is imported at the bank rate of exchange, currently LE 2.35 - 2.41 / US$, and subject to a 5% tariff.

Domestic Fertilizer Production

Organization for Production

There are at present six fertilizer companies operating 12 plants, of which 10 are in Lower Egypt and 2 in Upper Egypt. These companies are all either fully owned or majority owned by the GOE. Private participation in ownership is restricted to less than 3% of two companies, Abu Qir and Kima. The companies are supervised

by the Chemical Industries Organization (CIO), a chemical industry holding company under the Ministry of Industry (MOI).

The companies involved are:

SEMADCO

Abu Qir Fertilizer & Chemical Industries Co. - Abu Qir

Egyptian General Chemical Industries Co.- Kima

El Nasr Coke and Basic Chemicals Co.- El Nasr

Egyptian Financial and Industrial Co. - EFIC

Abu Zaabal Fertilizer & Chemical Industries Co.- Abu Zaabal

SEMADCO operates 2 nitrogen plants at Suez and a further 2 at Talkha in the Nile Delta. Abu Qir has a nitrogen plant at Abu Qir, near Alexandria. The Kima nitrogen complex is situated at Aswan. El Nasr has 2 nitrogen fertilizer plants at Helwan in the Delta. EFIC has 2 phosphate plants, one at Kafr - el - Zayaat, in the Delta, and the other at Assiut, in Upper Egypt. Abu Zaabal operates 2 phosphate plants in the Delta at Abu Zaabal.

Current Production Capability

Fertilizer production in Egypt commenced in 1937 with single superphosphate by EFIC. Since then further capacity has been established for both single (SSP) and triple superphosphate (TSP), bringing total capacity to 291,000 tons P2O5 annually. Nitrogen production started in 1951 with a small calcium nitrate (CN) plant at Suez. Since then, 7 more nitrogen plants have been established, bringing total annual design capacity to almost 820,000 tons N. The attainable annual capacity of both N and P2O5 is lower than design capacity due to the age of many of the plants and some technical bottlenecks. The CIO estimates current attainable N capacity at 734,000 tons, approximately 89 % of design capacity, and P2O5 capacity at 220,500 tons, about 76 % of design capacity. It should be noted that the plant management in all cases uses 300-day operation standards, not the conventional 330 days, to determine the attainable capacity on the ground that most of the plants are old and need more time for annual maintenance. Production in 1987-8 was 700,000 tons N and 190,000 tons P2O5, 85% and 100% of consumption, respectively.

SEMADCO facilities at Talkha I include a 400 tons-per-day (tpd) ammonia plant, a 900 tpd nitric acid plant in 4 lines, and a 1,000 tpd ammonium nitrate (AN) 31 % N plant. The small ammonia plant is of outdated design and uses about 17 Geiga calories (Gcal) of energy per ton of ammonia compared to 7 - 8.5 Gcal in modern

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efficient ammonia plants.

The Talkha II complex, established in 1975, consists of a 1,200 tpd ammonia plant and a 1,725 tpd urea plant. In 1985-6 both plants operated around 75 % of design capacity, in part due to some design limitations. The ammonia plant consumed about 12.4 Gcal per ton of ammonia.

The Suez fertilizer complex operated by SEMADCO consists of a 270 tpd ammonia plant, 3 nitric acid plants with a total capacity of 950 tpd, a 300 tpd sulfuric acid plant, a 1,000 tpd calcium nitrate (CN), 15.5 % N plant, and a 300 tpd ammonium sulfate (AS),20.6% N plant. In 1985-6 the acid plants operated at around 50 % of capacity and the other plants around 80 %. The low capacity utilizations were due in part to the old age of some of the plants which were originally established in 1951. The ammonia plant consumes about 17.4 Gcal of energy per ton of ammonia.

The Abu Qir complex was established in 1980 with a 1,000 tpd ammonia plant and a 1,550 tpd urea plant. A hydrogen recovery unit was installed at a later date and the original ammonia converter was upgraded, improving efficiency and increasing the effective capacity to 1,150 tpd. The ammonia capacity now exceeds the requirements of the urea plant by 200-250 tpd. During 1985-6 both plants operated at close to 100 % of original design capacity, and the ammonia plant consumed about 9.5 Gcal of energy per ton of ammonia.

The Abu Zaabal complex consists of 3 small sulfuric acid plants of 200 tpd, 250 tpd, and 650 tpd capacity, one phosphoric acid plant of 200 tpd capacity, one TSP plant, 880 tpd, and one SSP plant with 1,000 tpd capacity. In 1985-6 both the sulfuric acid and SSP plants operated at a capacity utilization close to 80 %, but the phosphoric acid and TSP plants operated at less than 30 % capacity due mainly to technical problems with the acid plant. Both SSP and TSP production is sub-standard due to the poor quality of the rock. The phosphoric acid plant requires around 3.1 tons of sulfuric acid per ton of phosphoric acid, but it is hoped to improve this to around 2.7 tons following installation of a beneficiation plant to increase the P2O5 content of the rock from around 24 % to 29 - 32 %. Plans are also in hand to install a third, stand-by evaporation line to increase capacity utilization.

The Kafr el Zayaat complex operated by EFIC includes 3 small sulfuric acid plants of 50, 160, and 300 tpd capacity and 2 SSP plants, each of 600 tpd capacity. All plants in 1985-6 operated around 90 % capacity utilization.

The other EFIC complex at Assuit consists of 2 sulfuric acid plants (250 and 300 tpd capacity) and 2 SSP plants, each of 600 tpd capacity. In 1985-6 capacity utilization averaged 73 % for the acid plants and 84 % for the SSP plants.

Product Quality

Deficiencies in fertilizer product quality in Egypt fall into three classifications: chemical, physical, and packaging.

Both SSP and TSP products have low water soluble P2O5 levels due to the low quality of the rock. SSP, while having a nominal 15 % water soluble P2O5 content and a total P2O5 content of 18 %, is more usually produced with only 12 - 13 % water soluble P2O5 and 15 % total. The TSP product from Abu Zaabal is produced with only 37.5 % total P2O5 compared to the more normal 44 - 46 % P2O5. In addition both SSP and TSP from Abu Zaabal have high moisture content levels, approximately 13 %, leading to caking and poor shelf life.

Urea produced at Abu Qir is coated but production from Talkha is not. CAN product from all plants contains 31 % N, AN product of 33.5% N, AS product of 20.6% N, and CN of 15.5.% N.

AS quality is only average, with small crystal size and discoloration in the by-product material, although the majority of the AS is of good quality . None of the phosphate products are granulated and dust is a problem in both manufacture, bagging, and use.

All products are packaged in 50 kg polyethylene bags. SEMADCO has its own bag manufacturing plant and uses a lighter gauge polyethylene (200 microns) than other manufacturers. Coupled with poor heat sealing there are severe breakage problems in handling, transportation, and storage. The dust problems with phosphate products have caused continual serious problems with heat sealing due to dust adhering to the top of the bags during filling. Often bags are closed by hand stitching, which leads to excessive product loss during handling and transit.

Operational Control and Planning

The CIO exercises considerable control over the operation of the individual companies. Each company has to get approval of CIO for annual budgets and production targets for each product, and CIO monitors the production performance of the companies through the CIO Fertilizer Consultative Committee. This committee comprises representatives of the individual companies, MOI, MOA, and the Agricultural Production and Stabilization Fund. Each year the companies have to provide to CIO the estimated production volumes and costs for each product. CIO reviews these costs with company management and sends them to MOI for approval with recommendations for selling prices. Selling prices are based on a formula of production costs plus 8 % ex-factory. Prior to January, 1988, transfer prices to PBDAC were set at a subsidized level for each product, in line with the subsidized retail prices at which PBDAC

was authorized to sell fertilizer. In this way each factory received direct subsidy payments to cover the shortfall between production costs plus 8% and the price charged to PBDAC. The changes made in January, 1988, included:

- Removal of direct subsidy payments to each company;
- Increasing selling prices to PBDAC to production costs plus 8 % ;
- Increasing the costs of natural gas,fuel oil, and electricity;and
- Averaging some factory production costs for comparable products.

This latter revision was applied to all products except urea and TSP, for which ex-factory prices were established on the basis of CIF landed prices when the TSP plant was commissioned in 1985. Urea prices were revised in 1987 to reflect increases in natural gas prices set in August, 1987, for these two plants.

No change was made to the basis of defining operating costs. The basis for this is efficient operation of the plant, which is defined as 90 % of agreed attainable capacity.

After approval of production costs by MOI, GAASF has to provide recommendations to the Ministry of Economics (MOE) and the Ministry of Planning (MOP) for the selling prices ex-factory to PBDAC. Final approval of these prices rests with the Supreme Council of Ministers. The CIO Fertilizer Consultative Committee also regularly reviews production, dispatches, and costs during the year. In addition, CIO also reviews the annual and long term investment plans of the fertilizer companies before forwarding them to the General Organization For Industrialization (GOFI). After review by both CIO and GOFI the investment plans have to be approved by the Ministries of Economy and Planning before they are submitted to the Supreme Council of Ministers for final approval.

Financial Performance

A World Bank report, (Egypt: Fertilizer Industry Review, EMENA Technical Department, January,1988), reviewed the 1985-6 financial performance of the six companies. After noting that there are marked financial distortions due to the GOE's control of both input and output prices, the report showed that only Abu Qir and El Nasr had reasonable profit levels, three of the companies were marginally profitable, and Abu Zaabal had no profit. Financial summaries of the companies are shown in Table III-2.

The report points out the liquidity problems faced by 3 of

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the companies and comments on the following areas of performance:

- Generally weak financial performance;
- No standard costing, cost accounting, financial planning, or capital budgeting;
- A need to improve internal and external auditing;
- Excessive inventories of spare parts and tools;
- Overstaffing, even by developing country standards with total employment of 22,132; and
- A need for improved management information systems to control costs and improve financial discipline.

With the change to subsidy arrangements in January, 1988, there was an accompanying increase in ex-factory selling prices, as shown in Table III-3, which reflected the increased costs of energy and addressed the low profitability problem of several companies, but it is not known whether any improvement in financial management has taken place. Table III-4 shows the development of ex-factory prices and direct subsidy payments to the companies. Notwithstanding the procedural changes made in January, 1988, it is obvious that there is little incentive for improved production or financial performance due to the guaranteed sale of output at a price level determined at cost plus 8%. In addition, the new arrangements, in which production costs are averaged between plants, are accompanied by a system of transfer payments between companies at the end of each year, so that those companies with more efficient plants have to pay part of their revenues to those companies with less efficient plants. This cannot be considered to provide any incentive for improved efficiency.

Economic Performance

Egypt's domestic fertilizer manufacturing industry, based on indigenous raw materials except for sulfur, displays a wide disparity in economic efficiency. The financial costs are distorted by government control of input prices, particularly natural gas, power, and fuel. In May, 1987, the price of natural gas to the urea plants was increased fourfold, and this increase was subsequently followed by increases in the cost of power and fuel to all fertilizer plants and increases for natural gas to non-urea factories in January, 1988. Table III-5. shows the major energy input prices compared to economic prices as from 1 May, 1988.

The GOE has been requested by the World Bank to increase the weighted average energy prices by about 45 % annually in nominal

terms to reach economic levels by 1994. If this is done then production costs for nitrogen producers would increase by about 45 % for AS from SEMADCO's Suez plant, and to 376 % for AN in Kima, according to the World Bank. Similar estimates for phosphate producers are lower, 2 - 6 %, because of the lower energy requirements.

A further increase in energy prices is proposed for July, 1989; it is believed that this will only restore the relative costs of energy to economic levels that have been eroded since January, 1988.

Table III-6 shows comparisons of financial and economic production costs for the domestic factories as calculated by the World Bank for 1985-6 and estimated for 1994-5 using a shadow exchange rate of LE 2.00 / US $ and comparisons with the long run estimates of CIF prices Alexandria. These long run estimates of world prices are considered to be more appropriate than current prices because of the depressed world prices that existed during the period 1984-7 from which recovery is only partially complete. In making the economic production cost estimates for 1994-5 assumptions were made regarding future investments for improving production efficiencies. In particular, the phosphate assumptions included beneficiation of rock and improvements to the phosphoric acid plant; the El Nasr assumptions for AN production included closing the Helwan ammonia plant and utilizing surplus ammonia from Abu Qir; and a general program of rehabilitation and revamping for most plants. No account was taken of rehabilitation plans for Kima which were considered uneconomic. The future of the Kima plant has since been revised to include ammonia production based on fuel oil.

As can be seen from Tables III-5 and III-6 the existing Kima plant and the SEMADCO Suez plants are uneconomic. The new plans for Kima will, however, provide AN at an economic cost comparable to world prices CIF Alexandria plus freight to Aswan.

In addition SEMADCO has decided to replace its existing Suez facilities with a new 400 tpd ammonia plant and a 1,000 tpd CAN plant. The World Bank has recommended that the AS plant should also be closed and that consideration should be given to upscaling the proposed 400 tpd ammonia plant to 1,000 tpd and utilizing the surplus ammonia for Kima,a recommendation that has now been precluded by the decision to go ahead with a fuel oil based ammonia plant at Kima.

Whatever final decisions are made with regard to revamping, new plants, and closure of existing old, uneconomic plants, it is possible for the Egyptian fertilizer industry to be put on a sound footing by the mid-1990's, competitive with world markets using economic values for energy inputs. The GOE has plans for expanding N and P fertilizer capacity mainly for meeting growing

local demand; these differ significantly from the World Bank proposals.

Investment Plans

Under the current Five Year Plan (1987 - 1992), the GOE has allocated LE 679 million for the development of the fertilizer manufacturing sector, including LE 93.4 million for the development of the rock phosphate mines. A summary of the proposed investments is given in Table III-7. The important developments in the Plan are a new nitrogen complex at Abu Qir, the development of the Abu Tahir project infrastructure for phosphate mine development, and the Kima project. The new Abu Qir facility comprises a 1,000 tpd ammonia plant, a 1,800 tpd nitric acid plant, and a 2,400 tpd AN plant. The complex is expected to be completed by December, 1989, at a cost of around US$ 250 million (LE 590 million). During 1988 production of CAN at all plants involved was converted to production with much less calcium content; and while the products are still CAN they contain 33.5% N and are referred to as AN in this report. Estimates made by the World Bank in 1987 show increases in nitrogen production from 700,000 tpa to around 1 million tpa by 1994-5, and increases in P2O5 production from 170,000 tpa to 333,000 tpa by 1994-5, assuming 90% utilization of capacity. These forecasts are shown in Table III-8 and Table III-9.

In March, 1989, the GOE announced plans to go ahead with a greatly modified rehabilitation of the Kima plant. This will include ammonia production based on fuel oil from the new Assiut refinery and production of 300,000 tpa AN. The World Bank and USAID will be providing financing for this project.

Future Production Capacity

By 1994-5 the domestic production capability should increase to approximately 1 million tons N and 360,000 tons P2O5 annually. This will place Egypt in a position of excess N capacity for a short period from 1991-2 to about 1994-5 and of excess P2O5 capacity from the mid-1990's. The excess capacity will be available for export sales.

Assessment

The Egyptian fertilizer manufacturing industry has the capability of supplying the domestic needs for N and P fertilizers through the 1990's at a cost which will be comparable with world prices, provided the current investment plans and proposals can be implemented. It can be expected that there will be a surplus of nitrogen products following the commissioning of the Abu Qir AN complex in late 1989 or early 1990. Authoritative forecasts, such

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as those made by the World Bank/UNIDO/FAO Fertilizer Working Group, are currently anticipating a shortfall in world nitrogen supplies during the early 1990's. It can therefore be expected that the Egyptian industry will be able to take advantage of higher world prices and generate needed foreign exchange from nitrogen exports.

There are many problems which the industry should tackle. These include the lack of direct incentives for improved efficiency and subsequently improved financial management of the companies; the separation of the investment planning and operating / maintenance functions; the poor product quality of all phosphate products and ammonium sulfate; and the packaging deficiencies referred to previously. The control and planning processes appear to be very cumbersome, restricting managerial control and divorcing decision-making from market forces.

Finished Fertilizer Imports

The expansion of the domestic industry has led to a decline in fertilizer imports in recent years. Nitrogen imports increased from 1961-2, when they accounted for 50% of consumption, to a peak in 1973 at 80% of consumption before declining. In 1987-8 imports of nitrogen were 10% of consumption. In recent years N imports have been primarily AN and AS. The last imports of urea were made in 1984-5. In 1982-3 a counter-trade protocol was agreed with the USSR which included the supply of AS from the USSR. Under this agreement Egypt was to receive 122,500 tons of AS in 1982-3 and 1983-4 and 126,000 annually from 1984/85 until 1986-7. In 1987-8 the annual tonnage was increased to 168,000 tons. Subsequently these contracts were fulfilled.

Phosphate imports averaged around 40% of total consumption during the early 1960's and then declined to zero from 1969 to 1973. From 1974 imports increased but were less than 12% of consumption until 1982. Increases occurred during the next three years with imports of Triple Superphosphate, which accounted for up to 20% of consumption. Since 1985 there have been no imports of phosphate fertilizers although consumption of the previously imported TSP occurred through 1987-8.

With no domestic production of potash, all potash fertilizers have been imported in the form of potassium sulfate. Details of public sector imports during the last 5 years are shown in Table III-10, including 1,550 tons of soluble NPK's supplied under Dutch Aid in 1987.

In addition to these imports there have been small quantities of imports made by the private sector in recent years. Further details on both public and private sector importation policies, planning, and procedures are provided in the chapter on fertilizer

marketing and distribution.

Fertilizer Exports

Egypt exported virtually no nitrogen fertilizers until the early 1980's. Following the establishment of the urea plants and the initial opposition to urea use by farmers, permission was given by the GOE to export urea and a total of approximately 480,000 tons was exported during 1983-4 and 1984-5. All of these exports were of bagged product, as there were no facilities for exporting in bulk. Various tenders were called and private sector companies competed for the export orders. No more exports were allowed until 1989, when permission was given for the export of 20,000 tons of urea which were originally part of a 1985 export contract. Also in early 1989 the GOE called for tenders for the export of 100,000 tons of urea and the import of AS, but the export tenders were subsequently rescinded.

There were small quantities of phosphate fertilizers exported since 1962, but there has been none since 1985-6.

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Table III-1

Phosphate Rock Production and Utilization in Egypt

1975-6 - 1986-7

	Production	Domestic Consumption	Exports
		(000 Tonnes)	
1975-6	536	431	105
1980-1	658	400	258
1981-2	720	491	229
1982-3	708	417	291
1983-4	647	307	340
1984-5	1,043	776	267
1985-6	1,074	932	142
1986-7	1,271	1,088	183

Source: British Sulfur, Fertilizer International, No.254, 1987.
FAO Fertilizer Year Books

Table III-2

Financial Highlights of Fertilizer Companies, 1985-6

(LE Millions unless otherwise noted)

	Abu Qir	SEMADCO	El Nasr	Kima	EFIC	Abu Zaabal
Net Sales	66.6	72.7	143.2	18.9	19.1	28.4
Subsidy	-	25.0	9.9	19.0	43.8	19.0
Net Profit	22.5	0.63	6.7	0.3	0.01	-
Total Assets	321.2	388.1	405.7	136.5	118.9	209.6
Equity	212.9	246.4	230.1	113.4	51.0	78.7
Long Term Debt	60.1	73.8	74.6	-	36.7	98.3
Current Assets	156.2	102.3	240.5	49.2	71.2	48.7
Current Liab.	48.2	67.9	101.0	23.1	31.0	32.6
Current Ratio	3.2	1.5	2.4	2.1	2.3	1.5
Acid Test Ratio	2.7	0.3	na	0.9	1.7	0.5
Debt Ratio	22%	23%	25%	0%	42%	56%
Return on Equity	10.6%	0.3%	2.9%	0.3%	0.02%	-

Source: Egypt: Fertilizer Industry Review, EMENA, Technical Department, January, 1988. The World Bank.

Table III-3

Ex-Factory Selling Prices, 1982-3 - 1988-9

(LE/tonne)

Company	Product	82-3-86-7	1 July 1987	1 Jan.1988[a]	July 1989[a]
SEMADCO	CN	26.60	35.90	116.00	126.00
SEMADCO	AS	32.50	48.60	140.44	205.00
El Nasr	AS	32.50	48.60	171.00	181.00
SEMADCO	CAN	46.20	56.10	98.00	-
Kima	CAN	48.00	61.50	139.00	-
SEMADCO	AN	-	62.18	152.00	166.00
El Nasr	AN	46.20	63.00	239.00	249.00
Kima	AN	-	71.58	209.00	249.00
SEMADCO	Urea	123.50	143.50	209.40	209.00
Abu Qir	Urea	127.70	147.70	209.40	209.00
Abu Zaabal	SSP	23.66	35.36	101.00	167.00
Assyut	SSP	23.66	35.36	101.00	147.00
EFIC	SSP	23.66	35.36	101.00	147.00
Abu Zaabal	TSP	60.74	89.74	301.00	395.00

a] Proposed but not approved.
Source: PBDAC.

Table III-4

Production Subsidies Paid to Domestic Factories

	(LE Millions)
1980-81	57.09
1981-82	74.75
1982-83	90.13
1983-84	92.37
1984-85	97.05
1985-86	100.75
1986-87	108.97
1987-88	107.10(a)

a):Payments ceased 31/12/87, includes payments of about LE 30 million.

Source: General Authority for Agricultural Price Stabalization Fund

Table III-5

Input Prices, May, 1987

	Local Price (L.E.)	Economic Price (L.E.)
Natural Gas/MMBTU	0.353 a/	4.3 b/
Power / kwh		
- Kima	0.0122	0.12
- Other Plants	0.0171 c/	0.12
Fuel Oil / ton	28.0	160.0

a/ For fertilizer plants.

b/ Fuel oil energy equivalent price.

c/ High voltage.

Source: Egypt: Fertilizer Industry Review, World Bank, EMENA Technical Department. January, 1988

Table III-6

Comparison of Financial and Economic Prices for Egyptian Fertilizer Production, 1985/86 and 1994/95

(US $ / t)

Plant and Product	1985/6 Financial	1985/6 Economic	1985/6 CIF	1994/5 a/ Economic	1994/5 a/ CIF
Kima CAN	60.8	291.8	79.0	349.0	181.0
El Nasr AN	98.0	152.0	85.0	n/a	n/a
SEMADCO CAN	39.6	133.6	79.0	129.5	181.0
Urea	35.6	111.5	100.0	121.3	175.0
AS	88.0	129.0	65.0	162.0	100.0
CN	41.9	94.4	55.0	116.0	93.0
Abu Qir Urea	35.2	91.1	100.0	120.0	175.0
Abu Zaabal SSP	52.0	68.2	49.0	74.0	80.0
TSP	158.9	202.8	150.0	205.0	210.0
EFIC Kafr SSP	40.3	55.4	49.0	80.0	80.0
Assiut SSP	40.0	55.0	49.0	74.0	80.0

a/ At 1985/6 prices.

Source: Egypt: Fertilizer Industry Review, World Bank, EMENA Technical Department, January, 1988

Table III-7

Fertilizer Sector Investment Plans 1987-92

Company		(LE Millions) Local	Foreign	Total
SEMADCO				
	- Renovation & Rehabilitation	30.5	56.4	86.9
	- Other	.7	2.6	3.3
	Sub-total	31.2	59.0	90.2
Abu Qir				
	- Renovation & Rehabilitation	1.7	1.6	3.3
	- New Investment Project	48.8	200.0	248.8
	- New Investment Project	15.8	1.2	17.0
	- Other	.3	1.2	1.5
	Sub-total	66.6	204.0	270.6
Kima				
	- Expansion & New Investment	10.0	14.4	24.4
El Nasr				
	- Renovation & Rehabilitation	13.3	20.0	33.3
	- New Investment Project	47.8	32.8	80.6
	- New Investment Project	.7	1.4	2.1
	- New Investment Project	.8	1.4	2.2
	- New Investment Project	.9	1.4	2.3
	- Other	.3	1.2	1.5
	Sub-total	63.8	58.2	122.0
EFIC				
	- Renovation & Rehabilitation	8.7	10.9	19.6
	- New Investment Project	17.8	19.8	37.6
	- Other	.3	1.2	1.5
	Sub-total	26.8	31.9	58.7
Abu Zabaal				
	- Renovation & Rehabilitation	7.3	10.7	18.0
	- Other	.3	1.2	1.5
	Sub-total	7.6	11.9	19.5
Red Sea FMC				
	- Renovation & Rehabilitation	3.5	1.5	5.0
Misr PC				
	- Renovation & Rehabilitation	2.0	1.0	3.0
El Nasr PC				
	- Renovation & Rehabilitation	6.0	2.0	8.0
Abu Tatur				
	- New Investment Project	5.0	.0	5.0
Abu Tahir				
	- Railway	13.0	2.0	15.0
	- Power	2.7	.0	2.7
	- Jetty	18.7	21.5	40.2
	- Water Supply	8.4	6.1	14.5
	Sub-total	42.8	29.6	72.4
	GRAND TOTAL	265.3	413.5	678.8

Source: Ministry of Industry

Table III-8

Forecast of Domestic Production: Nitrogen

('000 tonnes N)

Company	Product	1988-9	1989-90	1990-1	1991-2	1992-3	1993-4
SEMADCO	CN/CAN	36.4	36.0	36.0	71.6	81.8	92.1
	AN	93.8	94.0	94.0	97.7	98.7	99.7
	Urea	207.0	207.0	207.0	213.0	215.2	216.8
	AS	10.3	.0	.0	.0	.0	.0
Abu Qir	Urea	211.6	212.0	212.0	212.0	212.0	212.0
	AN	.0	.0	86.0	196.0	221.0	221.0
El Nasr	CAN	18.4	30.0	38.5	38.5	38.5	38.5
	AS	2.2	2.5	2.5	2.5	2.5	2.5
Kima	AN	83.8	90.0	90.0	101.5	101.5	101.5
TOTAL		663.4	671.5	766.0	932.8	971.2	984.1
Estimated Demand		800.0	820.0	840.5	861.5	883.1	905.1
Surplus(Deficit)		(136.6)	(148.5)	(74.5)	71.3	88.2	79.0

Table III-9

Forecast of Domestic Production: Phosphorus

('000 tonnes P)

Company	Product	1988-9	1989-90	1990-1	1991-2	1992-3	1993-4
EFIC	SSP	48.0	48.0	48.0	48.0	48.0	48.0
Assyut	SSP	49.5	50.0	50.0	50.0	50.0	50.0
Abu Zaabal	SSP	42.0	42.0	42.0	42.0	42.0	42.0
	TSP	45.0	55.2	58.5	85.0	97.2	109.3
TOTAL		184.5	195.2	198.5	225.0	237.2	249.3
Estimated Demand		194.6	195.2	198.5	204.0	210.0	217.0
Surplus(Deficit)		(10.1)	.0	.0	21.0	27.2	32.3

Table III-10

Public Sector Fertilizer Imports

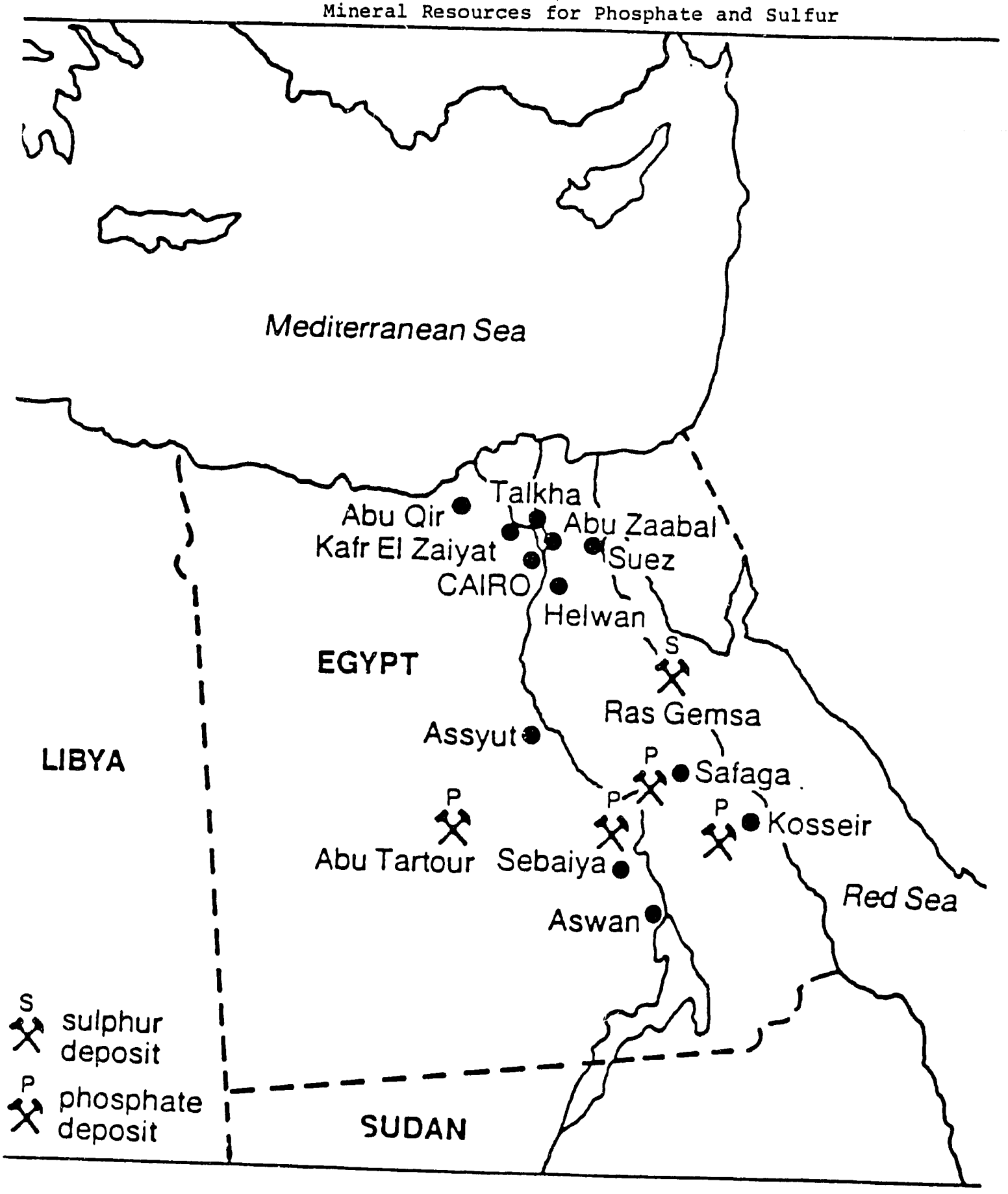
PRODUCT:	UREA	A.N.	A.S.	TSP	SUL.POT.
ANALYSIS:	46%N	33.5%N	20.6%N	44%P205	48%K20
PRODUCT TONNES					
1987/88		119230	176952	0	69872
1986/87		70366	193687	0	60301
1985/86	78659	183214	493376	0	50011
1984/85		52306	136410	49387	35175
1983/84		0	68474	71725	55211
1982/83		0	131237	160421	24961

	N	P205	K20
NUTRIENT TONNES			
1987/88	80514	0	33539
1986/87	63472	0	28944
1985/86	199195	0	24005
1984/85	45623	21730	16884
1983/84	14106	31557	26501
1982/83	27035	70585	11981

Source: PBDAC.

Exhibit III-1

Mineral Resources for Phosphate and Sulfur



IV. FERTILIZER USE

Development of Fertilizer Consumption

Fertilizer consumption in Egypt has increased substantially over the last 30 years, reaching 793,000 tons N, 191,000 tons P_2O_5, and 29,700 tons K_2O in 1987-8, contained in 3.5 million product tons. Since 1970-1 N consumption has increased by 5.3% per annum from 330,800 tons; P_2O_5 consumption has increased from a lower base of 40,200 tons by 9.6% per annum; and K_2O by 17.5% per annum from a negligeable base in 1970-1 of 1,900 tons.

In the past 5 years growth in consumption has been less spectacular. N consumption increased by an average 1.6% p.a. between 1983-4 and 1987-8, P_2O_5 by 4.8%, and K_2O by 14.1%, as shown in Table IV-1.

This table does not include the foliar fertilizers which will be treated as a separate topic. It should also be noted that consumption should not be equated with demand. The total supply of fertilizer available to Egyptian farmers is constrained by the level of domestic production and the availability of foreign exchange allocated for fertilizer imports. It is thought, for instance, that demand for potash could be around 70,000 tons K_2O but this demand is unfulfilled due to restrictions placed on imports in favor of nitrogen products.

A summary of fertilizer production, imports, exports, and consumption is provided in Table IV-2, based on FAO data through to 1982-3 and PBDAC data for the last 5 years. It should be noted that FAO data for 1983-4 to 1986-7 is quite different from the data supplied to the Study Team by PBDAC. There appears to be confusion between sales made by PBDAC of domestic and imported supplies in any one year and the supply to PBDAC from domestic and imported sources. Even with imports there is confusion between contracted tonnages in any one year and actual deliveries. In Table IV-2. the data for 1983-4 to 1987-8 represent the actual domestic production, imports, exports, and consumption as reported by PBDAC for both public and private sectors.

Fertilizer nutrient consumption in Egypt is often cited as being very high by world standards. This assertion contention is based on the use of comparisons of nutrient usage per hectare of cultivated land and permanent crops. For example, FAO reported that in 1984 Egypt used 364 kg of nutrients (N + P_2O_5 + K_2O) per hectare of cultivated land and permanent crops, placing its fertilizer usage intensity up with the high levels of Western European countries and well above those of developing countries.

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The unique nature of Egyptian agriculture - the almost total reliance on irrigation and a consequent cropping intensity of 2.2 crops - has to be taken into account. When this is done the average nutrient consumption per hectare of arable crop and permanent crop in 1984 was 165 kg., of which 133 kg was N, 29 kg P2O5, and 3.2 kg. K2O. Even this correction does not allow a correct comparison to be made. Stone and Webster (1985) compared Egyptian fertilizer use to that of irrigated agriculture in the USA and concluded that usage in Egypt was comparatively lower. Again, this is not a valid comparison because of environmental, varietal, and farm managerial practices. It should suffice to say that fertilizer use in Egypt is well developed by world standards but appears to be deficient in the optimum balance of nutrients used.

The Egyptian fertilizer product mix - that is the proportions of the various nitrogen, phosphate, and potash products used - seeks to reflect the agronomic needs of the soils, crops, and management practices, but has probably been distorted by a uniform pricing policy for nitrogen products. Table IV-3. shows the product mix for the last 5 years.

The striking feature about the product mix is the reliance on straight fertilizer products, with use of mixtures limited to specialized fully soluble NPK plus trace element mixtures for drip irrigation in new land areas and specialized greenhouse production systems. With the conversion of CAN plants to AN production and the commissioning of the Abu Qir AN plant the nitrogen product mix will swing to a predominance of urea and AN with continued smaller quantities of AS and CN. The alkaline soils and basin irrigation techniques combined with surface application of nitrogen fertilizer are not conducive to efficient utilization of urea. Volatilization losses from urea are very variable and in some circumstances nitrogen recovery has been as low as 10 %. In general terms CAN and AN are more efficient than urea for surface application. The MOA has, however, found that on the clay loams of the Nile Valley there is no significant difference in nitrogen efficiency between urea and AN or CAN when incorporated into the soil. On the coarse textured sandy soils urea has always been shown to be less efficient than either AN or AS, even with soil incorporation. In one trial AN nitrogen recovery was 75 % compared to urea at 55 %. Until 1987 there was no difference in the unit price (per kg N) between CAN, AN, AS, and urea; and faced with an equal cost choice farmers have shown a distinct preference for AN and CAN.

Single superphosphate has been the traditional phosphate product used in Egypt but in recent years, as shown in Table IV-3, there has been an increased use of Triple Superphosphate, encouraged by the GOE in order to take advantage of the lower freight costs involved with the more concentrated product. TSP was supplied initially from imports and then from the Abu Zaabal plant. No attempt has been made to introduce ammonium phosphates to the

Egyptian market. To date there have been no significant responses to sulfur and the use of over 1 million tons annually of SSP, containing 17 % S, and 200,000 tons of AS containing 24 % S, will have influenced this situation. Future increases in non- sulfur containing fertilizers may induce some S deficiencies in the future.

All the potash fertilizer has been supplied as potassium sulfate containing 48 % K2O. The use of potassium chloride is banned by decree based on the deleterious effect the chloride would have on already alkaline soils. Imports of potassium nitrate are also prohibited, but for reasons related to security rather than agronomy or soil chemistry. Compound fertilizers containing potassium nitrate are allowed entry, and the soluble NPK's imported in 1987-8 contain potassium nitrate.

There are quite distinct differences in both total nutrient use and product mix in the three main regions of the country. Tables IV-4 and IV-5 show the average nutrient consumption in tons and as a percent of total for Upper, Middle, and Lower Egypt averaged over the 5 years ending 1987-8. When expressed as nutrient usage per arable and permanent crop area the intensity of fertilizer use is highest in Upper Egypt and lowest in Lower Egypt, as shown in Table IV-5

The higher average rates in Upper Egypt reflect the high use on sugarcane in that region and the relatively higher proportion of crop area in wheat and maize compared to Middle and Lower Egypt. The high proportion of cotton and rice in Lower Egypt, with lower nitrogen application rates than used on sugarcane, wheat, and maize, bring down the average application rates. At the governorate level the largest quantity of fertilizer used is in Beheira Governorate. The average nutrient application rates in 1985-6 were, at 74, 20, and 2.7 kg/fd for N, P2O5, and K2O, respectively, lower than in Qena Governorate where sugar cane is prevalent. A summary of nutrient use by governorate is provided in Table IV-6. It should be noted that one third of the total use is accounted for by four Governorates: Beheira, Dakahlia, Sharkia and Gharbia.

There are considerable differences in product mix by governorate (see Table IV-8.) which are summarized by region in Table IV-7. In Upper Egypt there was no use of either CN or AS in 1987-8 as supplies were only made available from the Kima factory (CAN) plus urea and further supplies of CAN from the north. This is in contrast to earlier years when small quantities of AS were also made available in Upper Egypt. The regional and indeed the governorate product mix is as much a reflection of rational distribution as it is of agronomic suitability.

Seasonal use patterns for fertilizer, while exhibiting a summer peak throughout the country, vary considerably reflecting the cropping pattern differences between the major regions. See

Figure IV-1.

In Upper Egypt there is a small peak in May, associated with cotton and sugarcane plantings; a large peak in June - July for ratoon sugar and cotton sidedressing; and an intermediate peak in December for winter plantings and Nile season planted sugarcane sidedressing. In Middle and Lower Egypt the seasonal spread of sales is more even, with sales during the months of June to February varying between 4 and 9 % per month of total sales and a peak from March to May, when sales average between 11 and 13 % per month of annual sales. The March - May peak is related to the cotton, rice and maize planting and sidedressing use of nitrogen.

With little factory storage there is a relatively constant monthly supply of domestic fertilizer supplemented by imports of AS and AN, which are generally scheduled for arrival between October and March. This results in a good use of available field storage without the need for large inventory accumulation to meet excessive peak demand. Average stock turn arounds are 4.5 in Upper Egypt and 4.7 in Middle and Lower Egypt.

Fertilizer Use Technology

Fertilizer Use Recommendations

Fertilizer use recommendations are established by MOA from extensive field experiments throughout the country and are used as part of the annual planning and control system for fertilizer distribution and allocation. Within MOA the major crop recommendations for cotton, rice, maize, and wheat are made by the Agricultural Research Center (ARC); sugarcane recommendations by the Sugar Research Institute; and vegetable recommendations by the Horticulture Division of the MOA. In theory these recommendations are reviewed each year in the light of current or expected farm prices for both fertilizers and crops and adjusted to optimize economic application rates.

In reality it would appear that the recommended rates have been used to supplement the control of fertilizer use to a level consistent with available supplies, as constrained by the levels of local production, available foreign exchange for imports, and PBDAC's practice of holding 7%- 9% of fertilizer supplies in reserve. The recommended nitrogen application rates for 1965-6, 1975-6, 1984-5, and 1988-9 are shown in Table IV-9. for the major field crops. The recommendations have not been significantly changed since 1984-5 in spite of quite considerable changes in both output and input prices. It can be seen that the annual growth in recommended rates increased by 2.6 % in the decade to 1974-5, by 18 % in the next 10 years, and by only 0.1 % since 1984-5. The rapid growth in recommended rates between 1974-5 and 1984-5 can be explained by changes in crop varieties grown and new experimental

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evidence from fertilizer rate trials, but it also coincides with the rapid increase in available domestic nitrogen production. The recommendations for the major field crops are based on the average response curves established from extensive field experiments. The following generalized response equations were supplied by MOA.

Wheat: $Y = 2880.1259 + 21.8581X - 0.0593X$ [1]

where Y = crop yield in kg / ha.

X = nitrogen rate in kg /ha.

based on the results of 40 factorial experiments [1]

1]Source: Hamissa,M.R. et al,1984. Response of the newly released varieties of wheat to N,P,& K. Second General Conference of Agr.Res. Centre, Giza, 9-11 April,1984.

Cotton: $Y = 6.13 + 0.0522X - 0.000417X$ [2]

where Y = crop yield in kintars / feddan

X = nitrogen rate in kg / feddan

based on the results of 138 experiments [2]

2]Source:Hamissa,M.R. et al,1980. Cotton Fertilization Programme in A.R.E. Part I. Response of Cotton to N,P,& K. Agric.Res.Rev.(Egypt) V58(9) p 301-325.

Rice: $Y = 2.107 + 0.01336X - 0.0000513X^{2}$

where Y = crop yield in tons of paddy / feddan

X = nitrogen rate in kg / feddan

based on the results of 94 experiments [3]

3]Source:Hamissa,M.R.,Sharaf,M.,& Azizi,A.F.,1986. Economics of Rice Fertilization. Third International Conference on Rice.General Organization of Rice Mills and Marketing,Alexandria,1986.

Maize: $Y = 3.572 + 0.1266X - 0.00002188X$

where Y = crop yield in tons / ha

X = nitrogen rate in kg / ha

based on results of 68 experiments [4]

4]Source:Hamissa,M.R.,1980. Fertilizer Requirements for some Major Field Crops Under Irrigated Agriculture of Arid and Semi- arid Regions.Proceedings of the Fertilizer Flows Conference,Fertilizer Raw Material Resources,Needs and Commerce in Asia and the Pacific,Honolulu,East-West Center,1980.

At prices for the 1987-8 season these response equations indicate optimum economic rates for nitrogen of:

Wheat :-	80.8 kg / fd
Cotton:-	67.5 kg / fd
Rice :-	120.0 kg / fd
Maize :-	118.5 kg / fd

These are above the current technical recommendations issued by MOA except for cotton.

While these overall average recommendations, referred to as the technical requirements, are used for planning and control purposes, local area variations are employed by MOA extension workers at the district and village levels. The extent to which these variations differ from the technical requirements and the process and basis for any variations were not established by the Study Team, but evidence was provided of unsuitable product, i.e. urea, being allocated to new land areas.

Actual fertilizer rates used by farmers for individual crops are not systematically recorded, and there is a lack of evidence on this. Two sources of formal evidence and anecdotal evidence indicate that farmers' application rates vary considerably. The application rates on two of the three controlled crops, rice and cotton, are said to be lower than the technical recommendations; the rates used on vegetable crops much higher; and the rates used in new land areas are higher than the recommendations.

Evidence from the SPAAC survey indicated that farmers in Egypt were using the following rates of nitrogen in 1985-6:

	Farmer Use		Recommendation
	Upper Egypt	Lower Egypt	
	(kg N / fd.)		
Maize	82 - 151	122 - 135	93

Cotton	97 - 104	89 - 101	70 (63)
Soyabean	78 - 132	46	77 (33)
Sorghum	90	-	70
Tomatoes	237 - 467	223 - 296	124
Sugarcane	168 - 321	-	233
Wheat	35 - 88	58 - 82	70
Berseem	9 - 60	2 - 8	0

() indicates Delta recommendations.

1]Source: **Socio-Economic Research on the Private Market for Fertilizers in Upper Egypt**, Social Planning, Analysis and Administration Consultants, 1987.

Evidence from the surveys conducted by PBDAC Agricultural Production and Credit Project also indicates similar variations from the technical requirements in 12 governorates.

The generally higher levels of fertilizer use indicated by these survey results may be interpreted in several ways:

> The technical recommendations may be considered too low by farmers, given their individual experiences, local environments, and soils; the low subsidized prices may induce farmers to use higher rates, substituting nitrogen use for other inputs such as weed control; farm management practices, particularly poor irrigation practices, may give rise to lower nitrogen use efficiency than that obtained under experimental conditions; and farmers are also often more interested in by-product yields for animal fodder from the grain crops, an aspect not taken into account in the formulation of the technical recommendations.

Whatever the reasons for increased fertilizer rates used by farmers on particular crops, it has to be realized that the total quantity of fertilizer allocated throughout the country based on the technical recommendations is fixed, and therefore if rates are increased for some crops then they must be reduced on others.

Each year MOA produces technical recommendations for both winter and summer crops. These recommendations cover all aspects of crop management: cultivation, varieties, seeding rates, planting times, irrigation, fertilizer application rates and timing, and a weed and pest control. These recommendations make some attempt to

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localize the recommendations but it was observed that farmers do not appear to receive details on a systematic and regular basis. Indeed it was observed that a major complaint of farmers is the lack of access to technical advice.

Soil and Plant Tissue Analysis

The availability of soil and plant analysis services to farmers in Egypt is very limited. There are soil testing laboratories in 14 governorates, but their facilities, staffing, and funding limit their usefulness. Obviously the fragmentation of individual farms adds to the difficulty of implementing an effective and cost efficient soil analysis service for individual farmers. There are, however, opportunities to develop these services especially within the block cropping systems. At present it appears that the only systematic soil testing is that applied to cotton blocks. It was indicated to the Study Team that the private sector is making use of the available services from MOA for the optimum use of fertilizer under drip irrigation systems. The cost of providing these services is built into the cost of the specialized fertilizer products sold by the private sector companies.

Economics of Fertilizer Use

The economics of fertilizer use have been very favorable in Egypt; this has been a major factor in the development of widespread acceptance of the role of fertilizer, particularly nitrogen and phosphorus, in crop production. The favorable value/cost ratios(VCR), shown in Table IV-10, have been instrumental in encouraging farmers to adopt fertilizer use. It is generally accepted that VCR's above 3 are required to encourage developing country farmers to adopt fertilizer use and in Egypt this has been achieved. Recent developments in policy, where controlled prices for all but three crops have been removed and fertilizer subsidies reduced, have eroded the VCR's for the controlled crops. Even so, the economics of fertilizer use are still favorable for all crops at rates which appear to be in use by farmers. Figure IV-2. illustrates the optimum nitrogen rates for wheat, maize,cotton, and rice based on the response functions cited previously.

Projected Fertilizer Demand

It is considered that the development of detailed fertilizer demand projections are beyond the resources available to the Study Team, irrelevant to the basic objectives of the study, and likely to be technically unsound. The demand for fertilizer is a derived demand influenced by crop areas, fertilizer and crop prices,

availability and terms of credit, development of irrigation, availability of fertilizer, yield response functions, risk aversion, and technical and managerial expertise at the farm level, amongst other factors. In Egypt over the past thirty years the restricted availability of fertilizer and its allocated control has meant that fertilizer use has primarily been a function of supply. In addition the high level of government intervention and control throughout the sector has created large distortions to the demand function. Any analysis based on historical perspectives is unlikely to provide an accurate projection of future demand, especially as policy changes to decontrol the agriculture sector and move towards the interplay of market forces are implemented. Analyses based on time series are obviously inappropriate, and the accuracy of available data is inadequate for structural analysis.

In spite of the above limitations projections have been made by various organizations and consultants, primarily based on time series analysis, technical requirements, and projected cropping patterns and areas. Some of these projections are summarized below:

Fertilizer Demand Forecasts, Egypt

	Source	N	P2O5	K2O	Annual Growth Rate N
(1)	MOA,CIO a/				
	1985/86(actual)	774.8	183.4	na	
	1990	837.0	194.3	na	2.0 %
	1995	930.0	216.3	na	2.1 %
	2000	1,163.0	239.3	na	4.6 %
(2)	Kimira OY b/				
	1990	884.0	245.0	66.0	
	1995	1,008.0	290.0	91.0	2.7 %
	2000	1,139.0	335.0	117.0	2.5 %

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(3) Stone & Webster c/				
1990	816-989	na	na	
1995	944-1,443	na	na	3.0 - 7.8 %
(4) World Bank d/				
1990	882.0	227.2	na	
1995	1,038.0	296.0	na	3.3 %
2000	1,270.0	477.0	na	4.1 %
(5) FAO e/				
1990	756.2	159.8	43.0	
1995	883.8	211.7	68.8	3.2 %
2000	1,005.4	273.2	99.3	2.6 %

a/ The Egyptian National Fertilizer Plan for the Year 2000. 1980

b/ Pre-feasibility Study for Fertilizer Products, Plants and Markets, 1981.

c/ Kima Fertilizer Plant Pre-investment Analysis of Increasing Nitrogen Fertilizer Production in Upper Egypt, 1986.

d/ Egypt: Fertilizer Industry Review, EMENA Technical Department. January, 1988.

e/ FAO/UNIDO/World Bank Fertilizer Working Group. 1987.

Apart from the upper level projection made by Stone and Webster, which was based on an optimistic set of assumptions, there is a general agreement among the forecasts that the overall growth in nitrogen consumption will be between 2 and 3 % annually over the next decade, leading to around 1 million tons consumption by year 2000. For the purpose of examining the impact of privatization and the current policy of subsidy removal it should suffice to accept this generalization. In the later analysis only point impact of distribution and pricing changes on fertilizer demand are examined.

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Using a demand projection which assumes an average growth rate for nitrogen use of 2.5 % p.a. from the 1987/88 consumption level of 794,000 tons, consumption would reach 1.04 million tons by the year 2000. Tables III-8. and III-9 summarize the projected supply and demand situation based on this assumption and earlier assumptions regarding domestic production for N and P2O5. It Is assumed that the growth in P2O5 use will approximate 3% p.a. from the lower base of around 200,000 in 1987/88.

Increases in cropped area from new land development are expected to be offset to some extent by improvements in efficiency of use in the old lands and increased usage of drip irrigation on coarse textured soils. Increases in the costs of fertilizer from subsidy removal may also have a dampening effect on demand.

Table IV-1

Fertilizer Nutrient Consumption, 1983-4 - 1987-8

(000 tonnes)

Year	N	P2O5	K2O
1983-4	743.2	158.5	17.5
1984-5	638.0	163.3	24.2
1985-6	775.8	183.2	24.4
1986-7	776.0	185.4	28.9
1987-8	793.1	191.0	29.7

Source: PBDAC.

Table IV-2

Fertilizer Production, Imports, Exports, and Consumption

(Nitrogen '000 tons)

Financial Yr	Production	Imports	Exports	Consumption
1962	106.5	85.4	.0	191.9
1963	111.2	85.0	.0	196.1
1964	114.2	58.8	2.2	227.1
1965	128.1	120.3	2.6	260.6
1966	147.1	136.5	.0	284.8
1967	163.9	84.0	.0	243.8
1968	146.1	145.0	.0	244.1
1969	139.8	134.0	.0	281.4
1970	117.8	158.0	.0	310.1
1971	118.3	148.1	.0	330.8
1972	120.0	208.1	.3	324.5
1973	151.8	270.0	.0	360.9
1974	150.7	260.0	.0	358.2
1975	100.2	263.5	.0	360.0
1976	150.5	227.4	.0	415.0
1977	169.9	227.3	.0	427.7
1978	195.2	258.2	.0	459.5
1979	216.5	333.1	.0	490.5
1980	263.9	208.1	.0	500.0
1981	400.5	164.4	1.0	554.0
1982	482.0	162.6	1.6	585.0
1983	622.8	36.0	.4	667.8
1984	639.2	26.0	82.0	722.2
1985	625.9	143.5	138.0	649.2
1986	575.5	146.9	9.2	640.3
1987	601.8	53.6	.0	655.4
1988				

Source: FAO Fertilizer Database

1984	572.0	14.1	82.0	743.3
1985	701.0	45.6	138.0	638.0
1986	690.0	199.2	9.2	775.8
1987	662.3	63.5	.0	776.0
1988	663.6	60.5	.0	791.7
1989 a]	663.4	140.0	.0	800.0

a] Estimated

Source: PBDAC.

Table IV-2

(continued)

Fertilizer Production, Imports, Exports, and Consumption

(Phosphorus '000 tons)

Financial Yr	Production	Imports	Exports	Consumption
1962	25.6	19.7	1.0	48.4
1963	29.4	20.0	5.0	41.6
1964	31.6	20.0	4.6	47.9
1965	46.4	19.3	3.6	43.1
1966	42.5	9.8	4.4	52.2
1967	46.3	4.4	5.4	43.4
1968	52.2	3.7	4.3	35.5
1969	56.8	.0	7.2	38.6
1970	59.4	.0	9.0	36.2
1971	74.3	.0	12.1	40.2
1972	73.8	.0	11.8	46.3
1973	115.5	.0	18.2	55.7
1974	81.0	3.1	9.2	44.4
1975	95.0	2.0	5.1	65.0
1976	77.0	1.5	4.3	83.0
1977	73.7	4.8	4.7	66.4
1978	68.4	9.0	10.1	60.8
1979	97.8	1.0	15.3	86.9
1980	93.0	11.6	18.2	97.5
1981	106.0	10.5	13.2	102.0
1982	116.6	32.0	23.2	110.0
1983	145.8	32.0	30.5	149.6
1984	122.8	64.4	11.9	159.6
1985	112.0	69.0	9.7	181.0
1986	149.1	59.8	10.7	178.2
1987	128.1	.0	6.5	121.6
1988				

Source: FAO

1984	139.9	31.6	.0	158.5
1985	150.1	21.7	.0	163.3
1986	184.1	.0	.0	183.2
1987	186.6	.0	.0	185.4
1988	189.4	.0	.0	190.8
1989 a]	194.5	.0	.0	194.6

a] Estimate
Source: PBDAC.

Table IV-2

(continued)

Fertilizer Production, Imports, Exports, and Consumption

(Potash '000 tons)

Financial Yr	Production	Imports	Exports	Consumption
1962	.0	2.00	.0	2.00
1963	.0	1.25	.0	1.25
1964	.0	1.02	.0	1.03
1965	.0	.92	.0	.92
1966	.0	.59	.0	.59
1967	.0	.69	.0	.69
1968	.0	1.20	.0	1.20
1969	.0	1.96	.0	1.10
1970	.0	1.74	.0	1.52
1971	.0	3.07	.0	1.91
1972	.0	3.72	.0	1.64
1973	.0	4.00	.0	2.12
1974	.0	.75	.0	1.92
1975	.0	5.30	.0	3.60
1976	.0	5.33	.0	3.17
1977	.0	2.50	.0	2.84
1978	.0	.00	.0	2.74
1979	.0	5.00	.0	3.80
1980	.0	5.00	.0	6.70
1981	.0	7.50	.0	7.50
1982	.0	12.91	.0	12.91
1983	.0	8.32	.0	9.20
1984	.0	16.90	.0	17.50
1985	.0	34.40	.0	21.00
1986	.0	14.27	.0	25.00
1987	.0	37.20	.0	30.10
1988				

Source: FAO

1984	.0	26.5	.0	17.5
1985	.0	16.9	.0	24.2
1986	.0	24.0	.0	24.4
1987	.0	28.9	.0	28.9
1988	.0	33.5	.0	29.5
1989 a]	.0	30.0	.0	30.0

a] Estimate
Source: PBDAC.

Table IV-3

Fertilizer Product Mix, 1983-4 - 1987-8

	1983-4	1984-5	1985-6	1986-7	1987-8
Urea	61.4 %	53.3 %	53.3 %	55.0 %	55.5 %
AN	3.7 %	5.9 %	9.8 %	6.7 %	9.7 %
CAN	25.7 %	28.6 %	23.1 %	23.3 %	20.8 %
AS	5.6 %	5.4 %	4.2 %	4.5 %	4.8 %
CN	3.7 %	6.8 %	9.7 %	10.5 %	9.1 %
Mixtures	0.0 %	0.0 %	0.0 %	0.0 %	0.1 %
Nitrogen	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
SSP	69.4 %	79.2 %	87.7 %	80.1 %	79.4 %
TSP	30.6 %	20.8 %	12.3 %	19.9 %	24.5 %
Mixtures	0.0 %	0.0 %	0.0 %	0.0 %	0.1 %
Phosphate	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Sulfate of Potash	100.0 %	100.0 %	100.0 %	100.0 %	98.7 %
Mixtures	-	-	-	-	1.3 %
Potash	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

Table IV-4

Average Nutient Consumption by Region, 1983-4 - 1987-8

(000 tones)

Region	N	P2O5	K2O
Upper Egypt	166,881	33,005	10,063
Middle Egypt	182,782	39,913	3,842
Lower Egypt	396,069	105,591	15,060
		(%)	
Upper Egypt	22.4 %	17.8 %	30.9 %
Middle Egypt	24.5 %	22.5 %	15.1 %
Lower Egypt	53.1 %	59.7 %	54.0 %

Source: PBDAC.

Table IV-6

Nitrogen Use by Governorate, 1983-4 - 1987-8

GOVERNORATE	1983-4	1984-5	1985-6	1986-7	1987-8
Alexandria	7,793	7,971	9,565	12,777	14,654
Beheira	94,901	94,709	102,124	108,400	101,292
Gharbia	46,452	39,538	47,154	45,196	47,339
Kafr El Sheik	35,451	34,646	43,758	41,705	43,982
Dakahlia	57,515	45,056	61,507	56,029	58,179
Sharkia	69,722	66,197	71,876	73,787	76,330
Ismailia	9,011	10,873	14,834	14,900	16,411
Damietta	8,163	7,551	8,403	8,723	7,693
Menofia	48,854	44,634	51,462	49,829	54,629
Kalubia	28,162	24,922	27,418	26,835	27,352
Cairo	761	790	846	947	1,128
Giza	31,000	26,208	31,409	34,206	36,681
Beni Suef	36,663	18,942	32,135	29,653	33,140
Fayoum	36,087	29,974	35,865	35,435	37,613
Minya	63,595	47,748	58,707	58,750	60,940
Assiut	45,774	31,633	37,591	44,396	39,752
Sohag	42,973	25,812	44,281	38,169	38,630
Qena	62,318	61,226	68,391	70,336	69,989
Aswan	19,710	19,223	23,784	24,754	23,665
El Arish	212	280	433	555	533
Port Said a]	0	0	0	0	0
Suez a]	0	0	0	0	0
South Sinai a]	0	0	0	0	0
New Valley	1,134	1,094	1,283	1,455	1,593
Total	746,251	639,027	774,826	777,037	791,525
Upper Egypt	170,775	137,894	176,047	177,655	172,036
Middle Egypt	196,268	148,584	186,380	185,826	196,854
Lower Egypt	379,208	352,549	412,399	413,556	422,635

a] Included in Cairo data

Source: PBDAC.

Table IV-6

(continued)

Phosphorus Use by Governorate, 1983-4 - 1987-8

GOVERNORATE	1983/84	1984/85	1985/86	1986/87	1987/88
Alexandria	2,327	2,559	2,772	4,055	5,049
Beheira	24,779	27,160	28,510	29,640	31,076
Gharbia	10,243	10,365	13,631	11,020	11,113
Kafr El Sheik	10,511	10,118	11,422	11,209	11,565
Dakahlia	15,885	14,670	16,664	16,438	16,485
Sharkia	16,381	16,089	16,684	16,687	16,660
Ismailia	2,824	3,019	4,167	4,474	4,602
Damietta	2,600	2,550	2,684	2,769	2,833
Menofia	10,243	12,124	12,670	12,492	14,009
Kalubia	5,688	6,169	5,814	5,698	5,658
Cairo	155	171	211	233	287
Giza	5,741	5,968	5,903	6,773	7,214
Beni Suef	5,208	5,465	6,176	6,870	7,102
Fayoum	6,345	6,566	7,930	7,923	7,903
Minya	11,954	12,607	14,725	15,397	15,713
Assiut	7,759	8,005	9,683	8,508	8,462
Sohag	4,501	4,965	5,735	6,269	6,357
Qena	11,858	11,318	13,889	14,045	13,706
Aswan	4,289	3,847	5,296	4,428	4,481
El Arish	22	15	19	26	24
Port Said a]	0	0	0	0	0
Suez a]	0	0	0	0	0
South Sinai a]	0	0	0	0	0
New Valley	310	316	373	453	567
Total	159,623	164,068	184,958	185,407	190,866
Upper Egypt	28,407	28,137	34,603	33,250	33,005
Middle Egypt	35,091	36,946	40,759	42,894	43,877
Lower Egypt	96,125	98,985	109,596	109,263	113,984

a] Included in Cairo data

Source.PBDAC.

Table IV-6

(continued)

Potash Use by Governorate, 1983-4 - 1987-8

GOVERNORATE	1983/84	1984/85	1985/86	1986/87	1987/88
Alexandria	74	28	94	164	784
Beheira	3,204	3,998	3,676	4,764	5,034
Gharbia	555	1,546	1,377	1,355	1,220
Kafr El Sheik	322	416	316	356	396
Dakahlia	928	1,794	1,984	2,209	2,347
Sharkia	2,774	3,199	2,846	2,571	2,784
Ismailia	1,765	1,307	847	1,393	1,231
Damietta	189	262	195	224	159
Menofia	883	1,370	1,080	1,082	1,064
Kalubia	434	1,761	1,202	1,269	978
Cairo	5	39	3	21	15
Giza	372	543	618	972	1,135
Beni Suef	166	130	202	209	220
Fayoum	89	172	286	620	672
Minya	708	1,545	1,362	2,112	1,350
Assiut	879	1,844	1,924	2,448	2,044
Sohag	14	6	27	166	152
Qena	3,704	3,730	4,833	5,212	6,057
Aswan	362	516	1,460	1,710	1,810
El Arish	13	28	12	24	29
Port Said a]	0	0	0	0	0
Suez a]	0	0	0	0	0
South Sinai a]	0	0	0	0	0
New Valley	12	9	4	6	11
Total	17,472	24,243	24,368	28,887	29,493
Upper Egypt	4,979	6,096	8,244	9,536	10,063
Middle Egypt	1,774	4,190	3,673	5,203	4,370
Lower Egypt	10,719	13,957	12,451	14,148	15,060

a] Included in Cairo data

Source: PBDAC.

Table IV-5

Nutrient Usage by Region, 1985-6

(kg / feddan)

	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
	kg / hectare		
Upper Egypt	268.0	52.7	12.6
Middle Egypt	192.1	42.0	3.8
Lower Egypt	129.7	34.4	3.8

Source: Calculations from PBDAC and MOA data.

Table IV-7

Fertilizer Product Mix by Region, 1987-8

	Upper Egypt	Middle Egypt	Lower Egypt
Urea	53.6 %	66.8 %	52.3%
AN	.9 %	15.4 %	10.6 %
CAN	45.5 %	12.5 5	14.7 %
CN	0.0 %	3.9 %	7.0 %
AS	0.0 %	1.5 %	15.4 %
Total N	100.0 %	100.0 %	100.0 %
SSP	81.4 %	78.4 %	79.3 %
TSP	18.6 %	21.6 %	20.7 %
SP Total	100.0 %	100.0 %	100.0 %

Source: Calculations from PBDAC data.

Table IV-8

Nitrogen Product Mix, by Governorate, 1987-8

Governorate	UREA	AN	CAN	CN	AS
	(% of Total Nitrogen)				
Alexandria	46.05%	26.65%	9.27%	.00%	18.03%
Beheira	64.18%	7.75%	11.88%	.00%	16.19%
Gharbia	41.72%	8.91%	12.26%	15.35%	21.75%
Kafr El Sheik	56.37%	10.60%	13.30%	.00%	19.73%
Dakahlia	55.08%	9.96%	19.79%	.01%	15.16%
Sharkia	52.38%	7.39%	11.52%	10.60%	18.11%
Ismailia	19.73%	11.88%	54.01%	.00%	14.37%
Damietta	54.32%	10.24%	15.85%	.00%	19.59%
Menofia	55.10%	11.38%	12.01%	16.49%	5.02%
Kalubia	27.24%	24.90%	15.01%	25.23%	7.62%
Cairo	34.45%	.00%	1.68%	37.51%	26.36%
Giza	61.23%	17.67%	.38%	17.50%	3.23%
Beni Suef	68.34%	19.93%	11.33%	.22%	.19%
Fayoum	75.97%	12.60%	9.93%	.00%	1.50%
Minya	63.63%	13.19%	21.95%	.02%	1.21%
Assiut	78.19%	3.22%	18.58%	.00%	.00%
Sohag	69.24%	.03%	30.74%	.00%	.00%
Qena	49.21%	.00%	50.79%	.00%	.00%
Aswan	.00%	.87%	99.13%	.00%	.00%
El Arish	92.16%	.00%	.00%	.00%	7.84%
Port Said a]	.00%	.00%	.00%	.00%	.00%
Suez a]	.00%	.00%	.00%	.00%	.00%
South Sinai a]	.00%	.00%	.00%	.00%	.00%
New Valley	99.99%	.00%	.00%	.00%	.01%
Upper Egypt	53.63%	.87%	45.50%	.00%	.00%
Middle Egypt	66.79%	15.36%	12.47%	3.86%	1.51%
Lower Egypt	52.26%	10.60%	14.66%	7.03%	15.45%

a] Included in Cairo data
Source: PBDAC.

Source:PBDAC.

Table IV-8

(continued)

Phosphorus and Potash Product Mix, by Governorate, 1987-8

(% of Total Phosphorus and Potash)

Governorate	SSP	DSP	TSP	SUL POT
Alexandria	100.00%	.00%	.00%	100.00%
Beheira	79.41%	20.53%	.06%	100.00%
Gharbia	81.00%	18.22%	.82%	100.00%
Kafr El Sheik	86.67%	12.88%	.47%	100.00%
Dakahlia	67.57%	31.96%	.49%	100.00%
Sharkia	62.25%	36.96%	.82%	100.00%
Ismailia	99.02%	.98%	.00%	100.00%
Damietta	96.45%	3.55%	.00%	100.00%
Menofia	83.87%	15.80%	.34%	100.00%
Kalubia	89.11%	10.56%	.34%	100.00%
Cairo	100.00%	.00%	.00%	100.00%
Giza	74.39%	25.59%	.02%	100.00%
Beni Suef	90.85%	9.09%	.06%	100.00%
Fayoum	80.42%	19.56%	.02%	100.00%
Minya	73.47%	26.53%	.00%	100.00%
Assiut	98.29%	1.71%	.00%	100.00%
Sohag	89.15%	10.77%	.08%	100.00%
Qena	66.71%	33.29%	.00%	100.00%
Aswan	83.70%	16.30%	.00%	100.00%
El Arish	100.00%	.00%	.00%	100.00%
Port Said a]	.00%	.00%	.00%	.00%
Suez a]	.00%	.00%	.00%	.00%
South Sinai a]	.00%	.00%	.00%	.00%
New Valley	100.00%	.00%	.00%	100.00%
Upper Egypt	81.43%	18.55%	.01%	100.00%
Middle Egypt	78.35%	21.63%	.02%	100.00%
Lower Egypt	79.40%	20.24%	.36%	100.00%

a] Included in Cairo data
Source: PBDAC.

Source: PBDAC.

Table IV-9

Recommended Nutrient Requirements, By Crop

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 Egyp	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: PBDAC.

Table IV-10

Crop : Fertilizer Price Ratios

(LE/ton)

	NITROGEN a]	COTTON	RICE	SUGAR	WHEAT	MAIZE
b]						
1988/89	329.90	1100.00	275.00	40.00	290.00	360.00
1987/88	284.73	952.00	250.00	34.00	267.00	321.00
1986/87	276.47	727.32	203.00	30.50	200.00	254.64
1985/86	276.71	358.62	175.00	30.50	166.00	148.00
1984/85	276.75	358.62	168.50	24.20	148.00	148.00
1983/84	255.50	355.00	117.60	24.20	148.00	148.00

(Ratio Nitrogen:Crop)

b]					
1988-9	.30	1.20	8.25	1.14	.92
1987-8	.30	1.14	8.37	1.07	.89
1986-7	.38	1.36	9.06	1.38	1.09
1985-6	.77	1.58	9.07	1.67	1.87
1984-5	.77	1.64	11.44	1.87	1.87
1983-4	.72	2.17	10.56	1.73	1.73

a] Weighted Average Price
Source: Ministry of Agriculture, PBDAC, Team Calculations

Figure IV—1

Sales Distribution. By Month

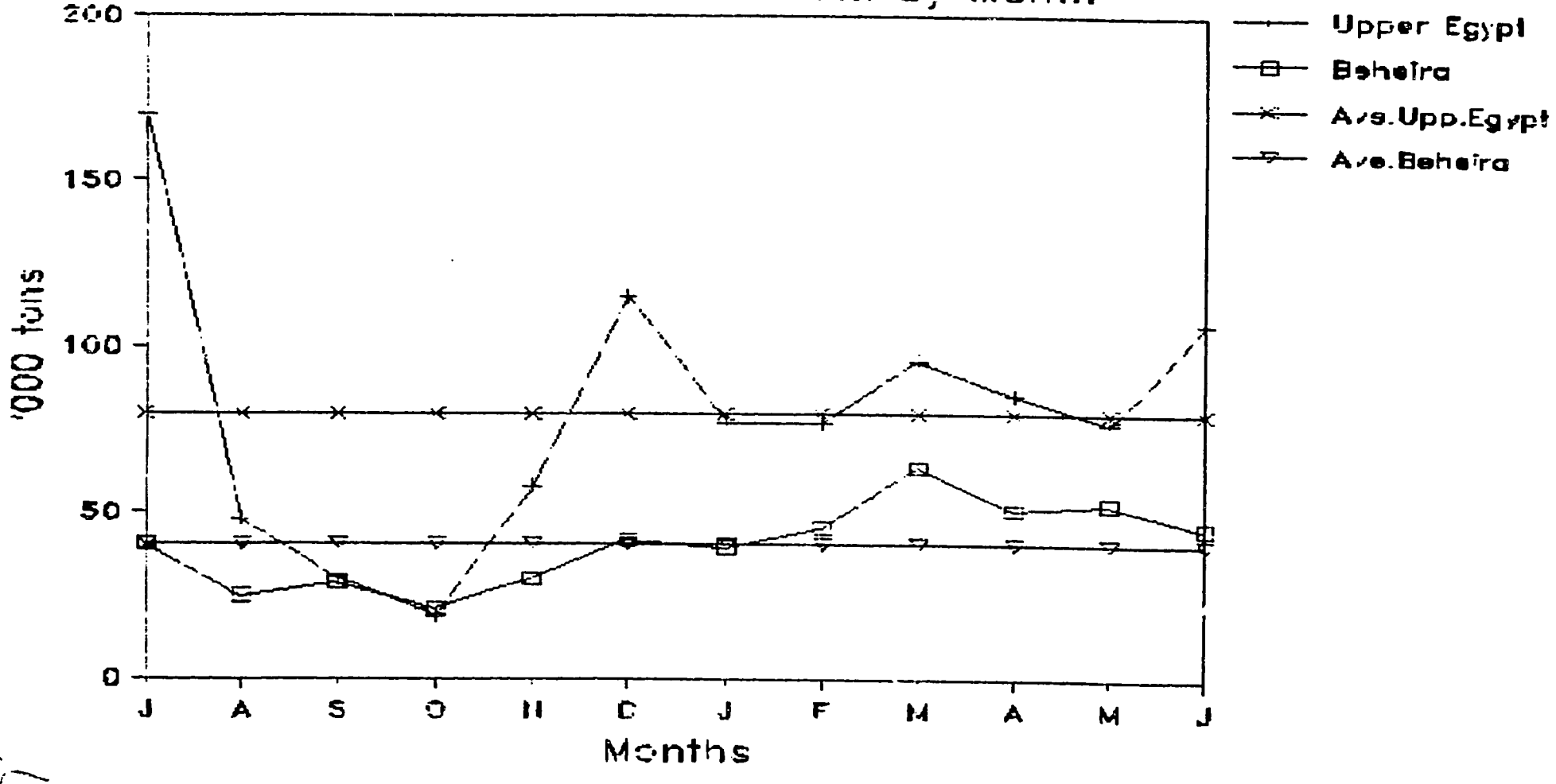


Figure IV–2

Cotton Nitrogen Response, 1987–8

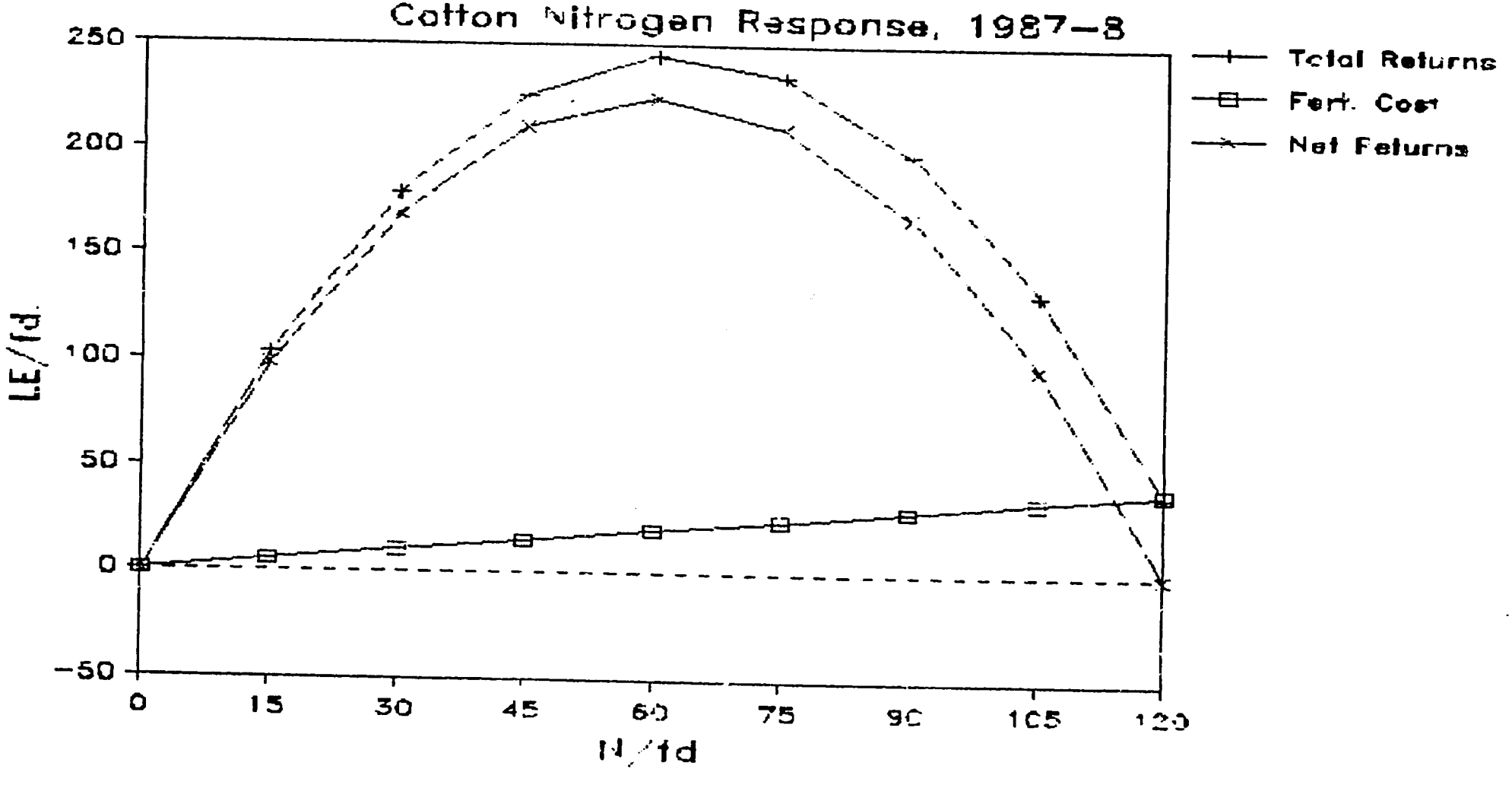


Figure IV-2 (continued)

Maize Nitrogen response, 1987-8

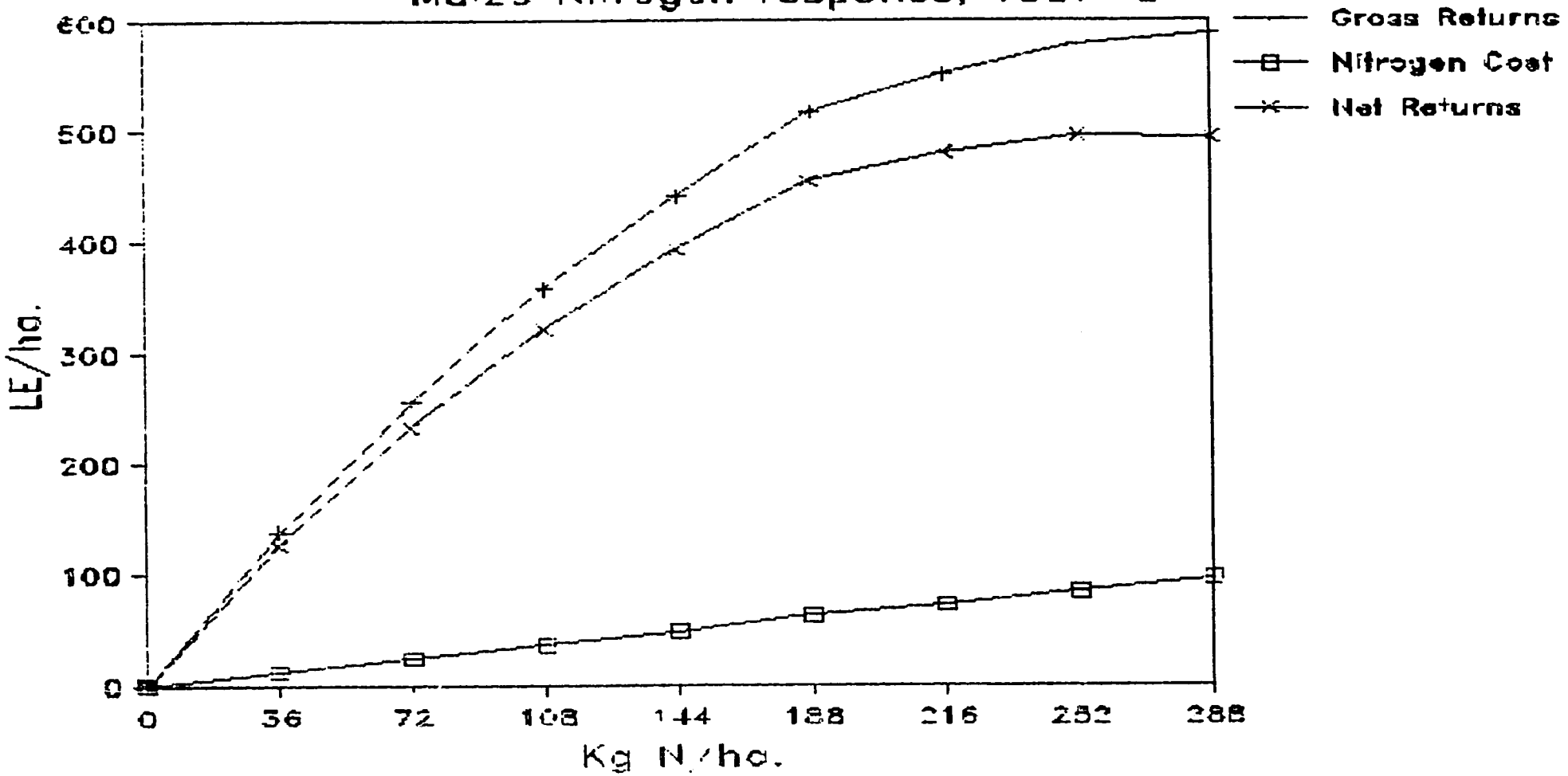


Figure IV-2 (continued)

Wheat Nitrogen Response, 1987-8

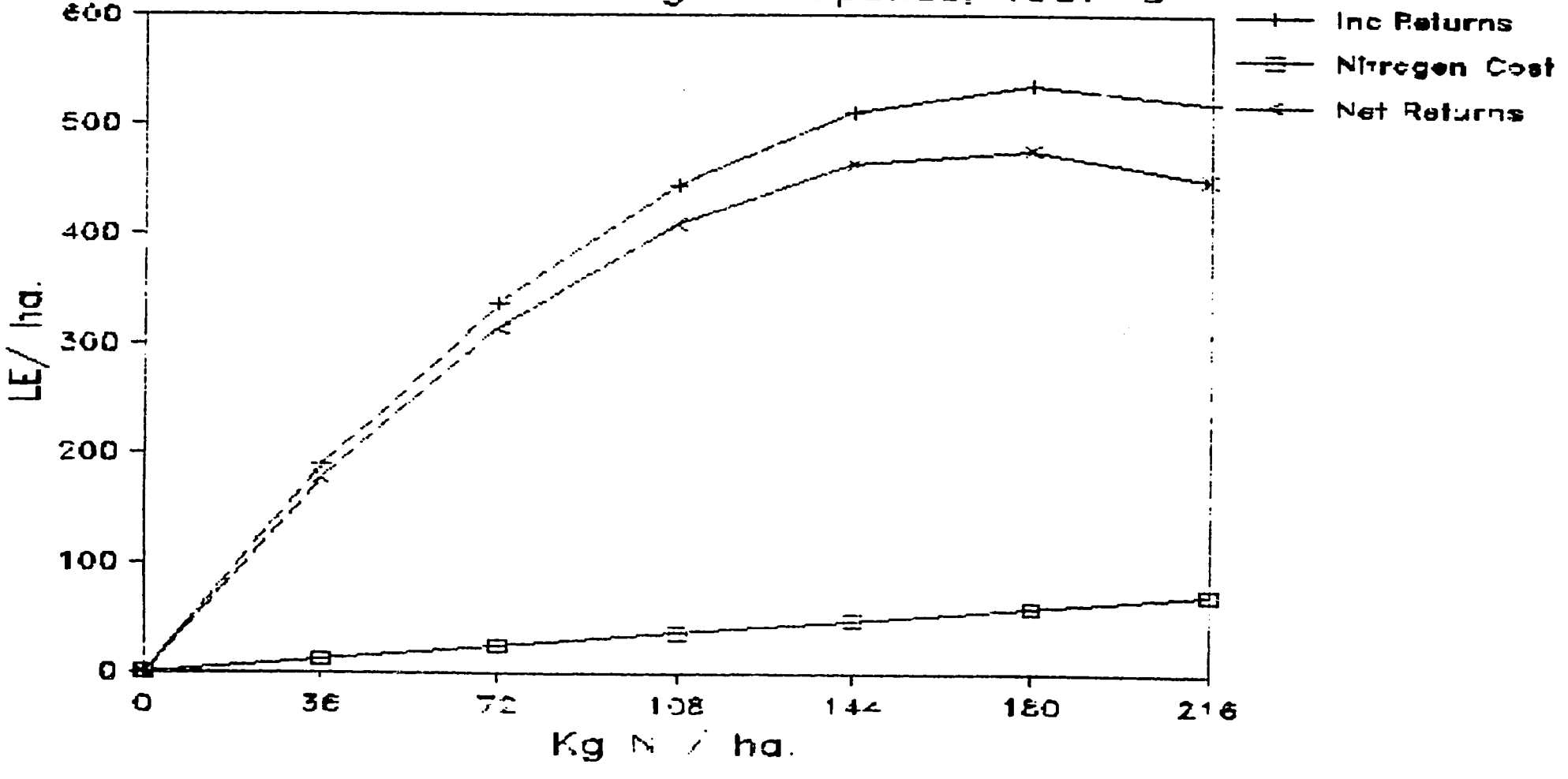
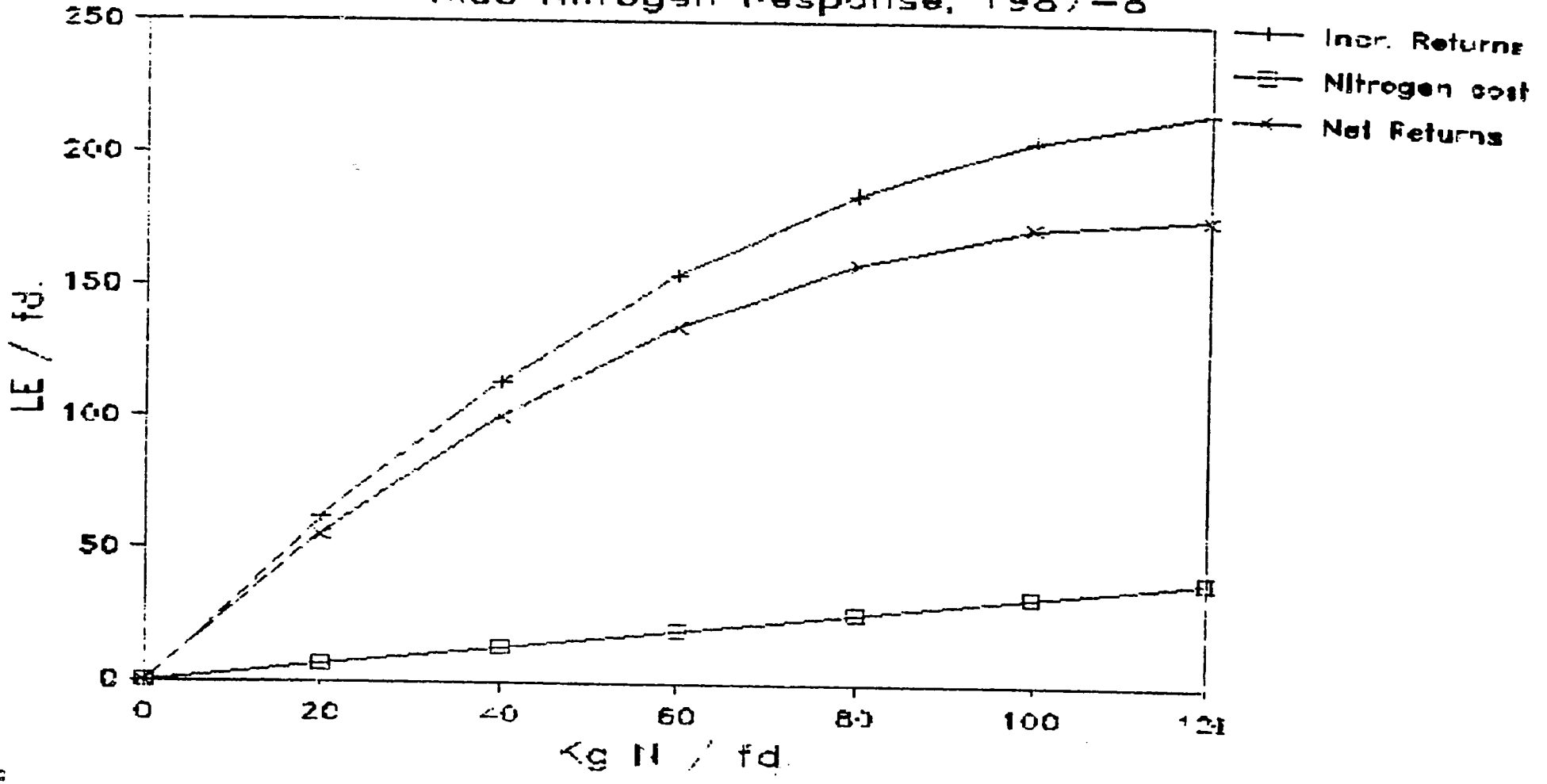


Figure IV-2 (continued)

Rice Nitrogen Response, 1987-8



V. FERTILIZER MARKETING AND DISTRIBUTION

Introduction

Prior to 1952 fertilizer distribution and marketing was in the private sector and almost entirely dependent on import supply. It was neither well developed nor reportedly well organized. From the 1950's until 1976 the responsibility for fertilizer distribution then rested with the Credit Cooperatives and Agrarian Reform Cooperatives. This system was completely overhauled in 1976 with the introduction of Law 117, which established The Principal Bank for Development and Agricultural Credit and vested monopoly control of fertilizer and other agricultural inputs distribution with the Bank. Today this system remains virtually unchanged, and forms an integral part of the government's control of production, import, distribution, and use of fertilizer. Despite many shortcomings the fertilizer distribution system as operated by PBDAC works well in ensuring the availability of 3.5 million tons of fertilizer annually to Egypt's farmers. The shortcomings of the system stem from the fact that PBDAC is not a marketing organization. It operates as a distribution and allocation control facilitating organization for the government.

Recent amendments to the legislation have, in theory, allowed private sector participation in fertilizer importation, and four private companies have become involved in this activity. Special dispensations have also recently allowed some private sector participation in distribution and marketing but to date the private sector involvement is minimal and fraught with financial and bureaucratic hurdles.

A third and final element exists in distribution and marketing, the so-called black market in fertilizers operated by farmers and traders at the village, district and governorate levels. This channel is essentially a redistribution process of the official allocations of fertilizer and a source of temporary cash credit for farmers. It exists due to the constraint on supply, the two-tier price system of subsidized and unsubsidized fertilizer, and because it provides a means of obtaining low-cost short-term cash credit.

The PBDAC Organization

PBDAC is a government instrumentality within the MOA. In principle the Board of Directors of PBDAC is responsible for setting the policy of the organization. In practice it is controlled by MOA, which appoints the Chairman as well as several Board members. Its operations are generally subservient to

facilitating the MOA policy and plans. PBDAC acts as a holding company with 17 affiliated governorate banks, BDACS, which operate a network of some 750 village banks. There are three main functions of the Bank: the supply and control of credit to the farmer, distribution of basic agricultural inputs to farmers, and the provision of services as a marketing agency for selected crops.

Fertilizer Procurement and Distribution

The Fertilizer Planning Process

Exhibit V-1 depicts the planning process and the flow of activities from the farm level through final decision making and approvals at the top levels of the government.

The process begins at the farm level where MOA and cooperative agents together with the farmer and village bank staff determine the cropping pattern at the village and farm level based on the agricultural plan for controlled crops, previous cropping patterns, and the prescribed block rotational sequence. (See Exhibit V-1).

The cropping patterns and areas are accumulated from the villages to the district level and then aggregated at the governorate level. These data are forwarded to PBDAC which calculates the governorate and total requirements of nitrogen, phosphate, and potash fertilizers based on the official fertilizer rates for both winter and summer cropping patterns. The initial requirements are calculated only in terms of CN, SSP, and SP equivalents.

At this point PBDAC formulates an initial product requirement plan based on previous years' sales and the cropping forecast. This plan is reviewed by the PBDAC Fertilizer Use Committee along with further data on stocks, supplies and costs. The Fertilizer Use Committee was until recently formed directly within MOA but is now formed within PBDAC. The Committee includes 3 members from PBDAC, including the chairman, who is the vice-chairman of the Bank; 3 members from the General Authority for Agricultural Price Stabalisation Fund (GAASF); 3 members from the ARC; and 1 member from MOA. Further information is supplied to the committee from the COI on monthly product production plans for the domestic factories, and from the Ministry of Transport on freight rates for public sector rail and trucking and cooperative trucking organizations.

This information is processed by the Committee and a preliminary national fertilizer budget is prepared, which is then included in the consolidated PBDAC budget. This includes allowances for counter trade fertilizer imports from the USSR and recommendations on other import requirements.

The Ministry of Planning is responsible for receiving ministerial budgets and preparing a national budget, which is then presented to the Ministry of Economy. The Ministry of Planning, at this time, reviews the proposed fertilizer plan and may call for amendments to the non-domestic supply. When a determination has been made on how the shortfall in requirements is to be handled, the resultant budget is submitted to the Ministry of Economy.

The Ministry of Economy is responsible for analyzing budgetary requirements in the context of the national plan consistent with current goals and financial constraints. It is in this process that the Ministry of Economy determines budget allocations which include domestic and foreign exchange components. The fertilizer import requirements submitted under PBDAC's budget are analyzed in the context of available foreign exchange and a final determination is made of the amount of fertilizer that can be imported for distribution and sale by PBDAC.

Finally, the PBDAC budget, and in particular the fertilizer component, is reviewed by the High Commission for Policy and Economic Affairs, where the budget is finally approved and the subsidized retail prices for fertilizer are fixed.

Following the establishment of retail prices, the PBDAC Fertilizer Use Committee re-estimates the fertilizer budget based on projected revenues and costs. The resultant deficit is calculated and presented to the Ministry of Finance which establishes a subsidy fund as an offset. The subsidy is managed by the GAASF, a department within MOA which is responsible for auditing PBDAC on a quarterly basis, determining subsidy requirements, and requesting the Ministry of Finance to credit PBDAC's commercial bank accounts.

This planning system is, to say the least, extremely complicated and time-consuming, and requires extensive cross linkages between various departments and organizations within MOA and among several ministries. The PBDAC Fertilizer Use Committee is, however, central to the whole process. The recent changes made to the organizational location of the Committee may improve the overall coordination of the planning. The Committee prepares the annual plan during the period from March to May but meets regularly throughout the year to review and amend the overall plan and recommend adjustments as circumstances warrant.

Within PBDAC the overall governorate fertilizer requirement plan is passed to the BDAC's for preparation of distribution plans within each governorate down to the village level.

Fertilizer Procurement

Domestic Supplies. Each of the six domestic manufacturing companies submits production plans by month to the CIO Fertilizer Committee for approval, and the approved plans and established selling prices ex-factory are submitted to the PBDAC Fertilizer Use Committee. The manufacturing companies are also responsible for arranging transport of fertilizer from the factories to the governorate warehouses or district shonas. There is close coordination between the factories and PBDAC for the lifting and transportation scheduling. The manufacturing companies invoice PBDAC on the basis of delivered cost to the storage points. PBDAC is obliged to accept all production from the factories and has little or no control over quality of either product or packaging.

Import Supplies. Exhibit V-2. depicts the organizational arrangements for the procurement of imported fertilizer supplies. The PBDAC Import Committee is central to the process and is chaired by the vice chairman of the Bank in charge of inputs. Committee members include 5 from PBDAC; 2 from GAASF; 1 from the Ministry of Finance; 1 from MerTrans (a public sector shipping organization); 1 from MOA; 1 from ARC; and 1 representative each from the Central Bank of Egypt and the Council of State.

The Committee, which meets twice a month, has two major functions: advising the Ministry of Economy on suitable quantities of counter trade fertilizer to be acquired through the trade protocol with the USSR, and arranging the procurement of commercially imported fertilizers from other sources.

The USSR counter trade began in 1982-3 and has been limited to imports of AS, negotiated annually. The agreement includes options to cancel all or part of the agreed tonnage or to replace AS with other products. The agreed tonnage increased to 126,000 tons AS in 1984-5 and stayed at this annual level until 1987-8, when it was increased to 168,000 tons. This product is received in bulk and bagged at Alexandria port prior to distribution. Although close to the agreed tonnages have been imported over the last 5 years, actual deliveries have fallen outside the intended years of receipt; it is not known whether this was due to requests from PBDAC or delays from the USSR. The final shipments of the 1987-8 contract had still to be received in March, 1989.

The Committee establishes the commercial import requirements and issues tenders to six public sector importing agents as part of the annual planning process. These agencies in turn request quotations from international traders and manufacturers. The tenders have in the past 5 years been for bagged AN and bulk AS, with imports of TSP ceasing in 1985-6.

Selection of successful tenders is primarily based on price,

given limited foreign exchange availability. This has in recent years led to the predominance of East European supplies being procured, and product quality has often not been good. Quotations are required in $US, cif Alexandria, with requirements for ship's gear for unloading bulk cargo. PBDAC formerly requested bulk with bags, as this was a cheaper option than purchasing domestic bags. This practice was stopped, however, following intervention by the Ministry of Industry to support local bag manufacturers.

Tenders are let in June - July each year for delivery from October to March. Until 1989 Alexandria port was used exclusively for fertilizer imports, with two wharves being available on a priority basis. The size of shipments is restricted to between 12,000 and 15,000 tons due to the 28' draft available and the limited bulk wharf facilities. In February, 1989, the first shipment of bagged AN was received at Damietta port but the future utilization of Damietta by PBDAC is uncertain owing to the increased wharf and storage costs over Alexandria. PBDAC leases two bulk storage sheds at Alexandria from the Port Authority, which have a total capacity of 13,000 tons. The public sector stevedoring company contracts all the shipment unloading and in turn sub-contracts the fertilizer unloading and bagging of bulk shipments to a private sector company.

The port unloading and bagging system appears to be quite efficient and is capable of achieving discharge rates of 3,000 bulk tons per day, utilizing ship's gear, transportable hoppers, and portable belt conveyers, and a bagging rate of 1,500 to 1,800 tons per day using 5 portable semi-automatic bagging machines.

Bulk cargo is moved directly by conveyor into the bulk warehouses and recovered from the bulk pile for bagging. From the bagging lines product is loaded directly to trucks for distribution. It is claimed that the bulk product is usually completely dispatched within three days of completion of discharge. PBDAC issues tenders for the supply of polyethylene bags from both public and private sector companies. Bagged product is discharged using a mobile port crane with slings, at an adjacent wharf. Again product is directly loaded to trucks for distribution but is often stockpiled on the open wharf before loading onto trucks, indicating some inefficiency in the organization of transport or the unloading system.

Observation of the wharf operations indicated that losses from the bulk system were not excessive and were assessed at around .5 to .75 %. No observations were made of the bag unloading.

A technical committee, representing agricultural quarantine, the importing agency, PBDAC, the private sector sub- contractor and the insurance company, is responsible for checking cargo quality including chemical analysis, agreeing quantity discharged, and negotiating or arbitrating any discrepancies from the tender

contract.

Physical Distribution System

PBDAC has a large and extensive distribution system throughout the agricultural areas, undoubtedly a major strength of its fertilizer activities. The system is organized at three levels; governorate warehouses, district shounas, and village mandubias, providing a total of almost 560,000 tons of storage space.

There are between 1 and 3 governorate warehouses located in each governorate, for a total of 65 providing storage capacity of approximately 230,000 tons. These warehouses are covered structures with masonary walls, usually about 1,000 m2 in area. The construction and configuration vary considerably, as do age and maintenance.

There are 476 shounas distributed by governorate as shown in Table V-1 with a total covered or partially covered storage capacity of 330,000 tons. These shounas are mostly fenced open areas ranging in size from 2,000 to 20,000 m2 and contain a small office structure and sometimes an open sided shed for storage. Most storage is in the open in block stacks 12 courses high with, sometimes, hessian covers on the top of the stacks. No dunnage is used and fertilizer stacks are made directly on the ground. Truck scales, paving, and lighting are rare, and there is no mechanized materials handling equipment.

The mandubias are retail outlets situated in 4,312 villages. They are usually less than 400 m2 and rarely offer any form of covered storage. In some locations the mandubias are located alongside the shounas and sometimes together with the village bank and shouna in the one location. When in close proximity to the other facilities the mandubias are run as separate entities from the Shouna, which is usually a wholesale distribution site.

PBDAC owns a total of 274 governorate warehouses and shounas and leases the other facilities. It is believed that most of the mandubias are leased.

Exhibit V-3 depicts how the three levels of distribution storage areas are utilized by the Bank. Deliveries from domestic factories or from the port are made to both the warehouses and the shounas. PBDAC claims that approximately 50 % of all the primary distribution is made direct to shounas, bypassing the warehouses and getting fertilizer closer to the location of final consumption. The restriction on this practice is the varying degree of access to shounas for 20-to-25 ton trucks used for most of this transportation.

Fertilizer is distributed to the mandubias in trucks of

smaller capacity more suited to the often unpaved access roads and limited access to the storages. Sometimes direct delivery to farms from shounas is arranged for larger orders, but the deliveries are processed through the mandubias.

Each shouna and mandubia is staffed by a site operator/manager called a mandub, employed by PBDAC. The mandub, uses casual labor for assistance in unloading and loading fertilizer, site maintenance, and stock movement within the facility. The mandubs are familiar with and responsible for the record keeping in the sites and are functionally responsible to the village bank managers. The village banks typically have a staff of 15 to 20 persons.

The operation of shounas and mandubias appears to vary considerably, and there does not appear to be a fixed standard of house-keeping or operational practice. Training of mandubs is restricted to training in the accounting proceedures of the Bank and does not include any systematic attempt to improve materials handling knowledge or abilities. Product losses in shounas cannot be gauged from PBDAC records. Stock control is excercised by the counting of bags without regard for the quality and quantity of their contents. Losses are passed on to farmers in the form of damaged bags, underweight bags, and substandard material. Fertilizer losses in the distribution and storage system have been estimated at around 5.5% but this figure is a best an educated guess. (Agricultural Storage Project, The World Bank. 1988).

PBDAC reports that approximately 2 million second hand bags are purchased annually by the BDACs for rebagging broken bags. This represents approximately 3% of the throughput; if 20% of the broken bag contents were lost then the losses would only be 0.6%, a level which should be considered as the absolute minimum estimate. Bearing in mind the reported sale of damaged and under-weight bags to farmers the level of losses may be in the order of 3 to 5%. While a portion of these losses has to be attributed to poor storage facilities and manual handling operations, including the reported use of hooks with polyethylene bags, it is obvious that defects in the bag quality, such as too light a gauge material and poor heat sealing, are a primary cause of product loss. This aspect is currently outside the control of PBDAC.

The PBDAC distribution system has the great advantage of being able to rationalize primary and secondary distribution throughout the country from the factories and ports onward. In addition, the location and number of mandubias provide farmers with ready access to fertilizer in close proximity (reportedly no more than 5 km) to every farm. There are, however, many weaknesses:

- The lack of investment in covered storage;
- The lack of maintenance of existing facilities;

- The lack of skills in storage and handling techniques; and

- The high level of product losses.

Currently PBDAC and the GOE are considering proposals made by the World Bank for the provision of an additional 584,000 tons of covered fertilizer storage capacity to be erected at shouna and governorate warehouse sites for a cost of $US46.5 million (LE107 million). This has been estimated to eliminate losses of 3% in the distribution network. Whilst the proposal is believed to include training for distribution personnel in addition to the provision of storage facilities it does not address the suitability and quality of the bags which are a primary source of current losses. Protection from direct sunlight, excessively high temperatures, and humidity, which are the main considerations for adequate fertilizer storage in Egypt, may be addressed by the provision of low cost shaded storage areas with concrete floors and the use of dunnage and tarpaulin covers in addition to the use of more suitable bags,namely ultra violet protection treated woven polypropylene bags with polyethylene liners.

Fertilizer Transport

Three transport modes are utilised by PBDAC: road, rail, and barge. Currently about 90% is transported by road, 9% by rail and only 1% by barge. The latter mode is restricted to deliveries from the Kima factory to Minia, Assiut, Sohag, and Qena Governorates. There are considerable technical difficulties associated with development of barge transport on the Nile.

Transportation is divided into three stages; transport from factories and port to governorates, intra-governorate transport, and final farm delivery. The mode of transport varies both between and within these stages.

Inter - Governorate Transport. The private sector company that sub-contracts unloading and bagging at Alexandria is responsible for the operational organization of truck transport from the port to governorates, but PBDAC fixes the freight contracts with four to six public sector trucking companies. Each of these companies has an allocated regional area into which it delivers, covering several governorates. PBDAC claims that only the public sector companies can mobilize fleets of sufficient size and suitability for delivering the large product quantities associated with import shipments. There are private sector companies, however, that do utilize private sector trucking companies for the distribution of yellow corn import shipments. It is not known whether these companies provide a better or cheaper service or whether PBDAC is obliged to utilize the public sector

only.

Road delivery of product from the domestic factories to the governorates is also contracted to public sector trucking companies. Each factory contracts with individual trucking companies on an annual basis but the actual lifting schedule is determined by PBDAC. These contracts include only the transport component. PBDAC is responsible for the unloading at warehouses and shounas. The trucking companies are responsible for insurance and any product losses in transit.

Rail deliveries are primarily used for delivery from the Talkha, Abu Qir, Assiut, and Suez factories to Upper Egypt. The rail transport is contracted and organized by the factories, and deliveries are made to rail heads, whence PBDAC arranges truck transport on to the warehouses and shounas. The quantities moved by rail declined from 144.3 million ton km in 1981-2 to 117.5 million in 1983-4 but since increased to around 140 million ton km[1]. The reluctance to use rail transport is apparently due to the risk of pilfering from rail cars and probably the greater degree of organization required on the part of both the factories and PBDAC.

Barge transport on the Nile is restricted to Upper Egypt because of the lack of infrastructure for river transportation. The Kima factory contracts to deliver product to the river port only. PBDAC then contracts with two public sector and four private sector barge companies for barge transportation to the down river ports. Product is then trans shipped to truck for final delivery to warehouses and shounas. In spite of the multihandling involved, barge transportation provides the cheapest ton-km freight costs for delivery to the governorates.

Intra-Governorate Transport. Once fertilizer has been delivered into a governorate it is illegal to transport it outside the governorate. Intra-governorate transport from warehouses and shounas to mandubias is all completed by truck, and is the functional responsibilty of the BDACs. Within each governorate the BDAC contracts with the cooperative trucking companies, which are cooperatives composed of individual private sector companies and individuals, on an annual basis for the delivery of product to mandubias and occassionally direct to farms. The trucks operated by the cooperative members are generally smaller than the 20-to-25 ton trucks operated by the public sector companies involved in inter-governorate transport. The trucks range in size from 3 to 10 tons capacity.

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1 Central Agency for Public Mobilization and Statistics, Statistical Yearbook, 1988.

Farm Delivery. Farmers either transport fertilizer themselves from the mandubias to farms or arrange for local transport with neighbors. A whole range of transportation is available in the villages from small trucks and pick-ups to horse or donkey carts. As the distances involved from mandubias to farms are usually less than 5 km there are no real problems involved for on-farm delivery.

Transport Costs

All fertilizer freight rates are fixed by decree and are subsidized to a greater or lesser degree depending on the mode. Road freieght rates were fixed in July, 1985, and apart from an increase in minimum charges have remained unchanged since then. As with all other sectors of the economy fertilizer road freight costs are indirectly subsidized through the domestic pricing of fuel. Fertilizer freight rates by rail are scheduled under category 13, the lowest of all the rail freights.

The current inter-governorate road freight cost schedule is summarized below:

from 1 to 275 km - 35.6 millims per ton km

from 276 to 600 km - 26.0 millims per ton km

from 601 km up - 22.0 millims per ton km

These charges have been subject to a minimum of LE 6.78 per ton since 1988 when the minimum charge was increased by 15%.

In addition to this general schedule there are higher rates for transportation from Port Said to Ismailia and El Wadi to El Gedid and for transportation in North and South Sinai Governorates, in addition to fixed charges for Nile crossings.

Intra-governorate freight rates are 75 millims per ton/km up to 35 km and 20 millims per ton/km over the first 35 km with a minimum charge of LE 4.5 per ton. Loading and unloading charges are also fixed by decree; currently 70 millims per ton.

Road transportation is the most expensive of the three modes available in Egypt in both financial and, according to calculations by Handoussa[2], economic terms.

The cross-over distance from truck to rail was estimated by

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[2] Handoussa, M.A., Egypt Fertilizer Sector Review, Consultant's Report for World Bank. May, 1987.

Handoussa at 125 km and yet in 1985-6 60% of fertilizer deliveries to Upper Egypt, calculated on a ton/km basis, were made by truck and only 36% by rail. It was further calculated, albeit in an approximate manner, that savings of LE 0.04 per ton/km could be made by transferring all long distance freight to rail for a total annual saving of approximately LE 8 million.

It appears that these calculations did not attempt to fully cost transport by rail, including the transhipment to truck and road freight costs to warehouses and shounas. Even so, if the net savings from the exclusive use of rail for delivery to Upper Egypt from the Delta factories were LE 0.02 per ton/km this would represent a total annual saving of LE 4 million or approximately 14% of the total inter-governorate freight cost. Whether or not the rail authorities have the capacity to carry another 400,000 to 500,000 tons annually to Upper Egypt is not known. It would appear, however, that the current situation for long distance freight should be analyzed fully to ascertain the real net benefits that could arise from rationalization.

PBDAC budgets annual freight costs for delivery from factories and Alexandria to governorates on the basis of an average cost per ton from each source. The budget estimates for 1988-9 are shown in Table V-2. The average budgeted cost for domestic and imported products, based on the preceding year's costs, is LE 7.32 per ton, with a range from LE 4 to LE 10. The total budget is based on 3.175 million tons and the total inter-governorate freight cost LE 23.25 million. This total tonnage is approximately 300,000 tons below actual sales in 1987-8. The current estimates of PBDAC are that total sales in 1988-9 will be similar to the previous year. If this is the case then the total inter-governorate freight cost will be approximately LE 25.5 million for the current year.

GAASF and PBDAC claim that the actual variation from budget for these freight costs is minimal. If actual costs are below the budget, the benefits do not pass to PBDAC but are manifested in reduced subsidy payments to PBDAC. This arrangement does little to stimulate greater efficiencies in freight arrangements.

A different situation exists for intra-governorate freight. PBDAC and the indivdual BDAC's budget on the basis of LE 4.5 per ton average cost for all tonnage moved. Any savings from this average cost are retained by the BDAC's. While the annual variations from budget are reported as being minimal, this arrangement offers some incentive to avoid unnecessary product movement.

Overall Fertilizer Marketing and Distribution Costs

The overall level of fertilizer distribution and marketing

costs can usually be considered in several major groupings:

- Procurement costs;
- Governorate level distribution costs;
- Village level distribution costs;
- Transport costs;
- Cost of warehousing;
- Inventory carrying charges;
- Handling and storage losses;
- Selling costs;
- Administration costs; and
- Service costs.

In the PBDAC system this complete analysis cannot be accomplished with any accuracy owing to the absence of sufficient detailed records at the local level. In addition, PBDAC has operated as a facilitating agency of the GOE with regard to fertilizer distribution, and the accounting proceedures, while valid and lawful, are not conducive to providing meaningful management information. As an agent of the government, PBDAC does not take legal title to the fertilizer products; records of stocks, cost of sales, and fertilizer sales revenues are treated as off balance sheet or income statement items, with income being treated only as the commissions received.

Despite this situation sufficient information is available to provide an overall picture of distribution and marketing costs.

Procurement Costs

Domestic Fertilizers. Table III-3 presented the ex-factory selling prices to PBDAC of domestic fertilizers over the past 5 years, by product and by factory. Prices were constant from 1982-3 until May, 1987, when they were increased by approximately 50% except for urea and CAN from Kima, and TSP, which was set at the import price level. Until January, 1988, the ex-factory prices to PBDAC were subsidized. When this policy was changed to paying all the subsidy as a distribution subsidy to PBDAC, the prices reflected the financial cost of production for the first time. In addition to the transfer of the subsidy the January, 1988, price increases reflected the cost increases associated with the increased energy costs charged to all the plants. The Kima CAN and SEMADCO AS plants may still have been receiving some subsidy to

compensate for the high production costs of these plants.

Small adjustments were made to the prices in July, 1988, and the Kima and SEMADCO AS prices were adusted to reflect actual production costs. The proposed prices for July, 1989, are also shown in Table III-3 which include substantial rises for phosphates (31% to 47%) and a further 19% increase for Kima AN.

These proposed prices, bagged ex-factory, in US$ using the current exchange rate of LE2.4, are close to world prices, bulk fob, as of December,1988, with the exception of urea the price of which is substantally below the current world price. The economic prices, especially for the nitrogen products except urea, are estimated to be still higher than world prices, but not excessively so. Proposed and world prices are shown below.

	Proposed 1989-90 Prices (bagged ex-factory)		World Prices (bulk fob)
	L.E./t	US$/t	US$/t
TSP	395	164.6	164.5
SSP	147	61.2	64.4
Urea	209	87.1	120 - 146
AN	249	103.7	105 - 110
AS	171	71.2	55 - 60

The depreciation of the LE and the partial increase in energy costs towards economic values have contributed to creating this comparatively improved position compared to pre 1985-6 in rationalizing domestic pricing ex-factory.

The total value of domestic product purchases has increased from slightly over LE 200 million in 1985-6 and 1986-7 to almost LE 350 in 1987-8. At the proposed prices for 1989-90 the total cost delivered to the governorates will be around LE 400 million.

Imported Fertilizers. The cost of imports in US$, c & f Alexandria, over the past 5 years has been in line with the prevailing depressed world prices. The ammonium sulfate imports under the protocol arrangement with the USSR have generally been priced at between 2 and 3 US$ per ton above commercial purchases.

The most important aspect of the imported prices has been the preferential exchange rate that has been applied. For all fertilizer imports made by PBDAC the exchange rate has been LE 0.707 per $1.00. This not only provided PBDAC with lower import costs but has also increased the indirect subsidisation of imports.

The actual c & f prices are shown below as averages for the

quantities landed each year.

U.S. $ Per ton c & f Alexandria:

Product	Urea	AN	AS	TSP	SP
1983-4	-	-	45.69	157.46	213.91
1984-5	-	137.00	87.85	160.85	225.87
1985-6	140.00	102.66	72.15	-	225.87
1986-7	-	87.23	54.23	-	178.60
1987-8	-	102.85	68.63	-	213.93

LE Per ton c & f Alexandria

Product	Urea	AN	AS	TSP	SP
1983-4	-	-	32.30	112.74	151.23
1984-5	-	96.86	62.11	113.72	159.69
1985-6	98.98	72.58	51.01	-	159.59
1986-7	-	61.67	38.59	-	126.27
1987-8	-	72.72	48.52	-	151.25

The c & f costs are inclusive of the agents' commissions. Other costs include:

- Insurance at 2.5 % of c&f values;
- Tariff at 10 % of c&f values;
- Harbor dues and warf charges, including bulk store rental;
- Unloading charges;
- Bags and bagging charges;
- Losses, estimated at 0.75 %; and
- Demurrage.

The PBDAC contracts for unloading and bagging are inclusive of charges by the stevedoring company and the sub-contracting private sector company and were last revised in 1988. The current

charges are:

Uloading bagged products	-	LE 2.31/t
Unloading bulk and mechanised bagging	-	LE 9/t
Uloading bulk and manual bagging	-	LE 4/t

The actual stevedoring charges for unloading bags and loading trucks is LE 3/t. The use of manual bagging as a normal practice has been discontined. The private sector company that manages the unloading and bagging operation claims that the charges are too low and should be increased by about LE 4/t for machanized bagging.

PBDAC paid LE 25.8/t for bags in its last tender from local suppliers. This was 50% more than the cost of obtaining bags with bulk from the exporters; the last quotation received was US$ 7/t (LE 16.8).

All imports are distributed by truck to the governorates and the average cost is LE 10/t. Estimates of the full costs of imported products for the last 5 years are given in Table V-10.

The total cost of PBDAC's imports in 1987-8 delivered into the governorates was LE 46.1 million at the preferential exchange rate. At the bank rate of exhange of le 2.3 applicable in 1987-8 the total cost would have been LE 119.7 million. There was therefore an indirect subsidy of almost LE 74 million.

Distribution and Marketing Costs

Total PBDAC distribution and marketing costs were reported to be LE 9.84/t and LE 11.51/t for 1986-7 and 1987-8, respectively. Details are shown in Tables V-3 and V-4.

The direct costs associated with fertilizer distribution are almost 90% of the total, with only 13 - 14% being an allocation of overheads. The accounting procedures used to determine the costs allocated to fertilizers are basically estimates. The direct costs are assummed to be 80% of the total costs of input distribution. How the total costs of running a warehouse, shouna, or mandubia are allocated between input distribution and crop marketing is not clear. The allocation of organization overheads is reportedly made on the basis of a pro rata allocation in relation to the direct costs.

Labor costs account for 65% of total costs; a further 9% is accounted for in services, primarily travelling and non-freight transportation costs; and financing and interest charges comprise 17% of the total. Depreciation, maintenance, and normal marketing expenses such as advertising, promotion, and market devlopment are virtually non existant.

The financing costs at 12% interest rate on average monthly

stocks, estimated to be 22% of annual sales, are low at LE 1.95/t due to the relatively high stock turn of 4.6.

Depreciation charges are low as most distribution points owned by PBDAC have a fully written-off book value and no revaluation of assets has been made. Other physical assets are minimal.

When total transport costs are included the total distribution and marketing costs in 1987-8 were LE 25.35/t, including an allowance for 3% losses, which the PBDAC accounting system does not recognize. From Table V-5. it can be seen that transport accounts for approximately 40% (LE 10.96/t), finance only 8%, and loss allowance 11%. The total marketing cost per ton is low compared with those of other developing countries, but comparisons should be made with caution as transport costs which comprise the largest item are greatly dependent on market dispersion. In 1986-7 total marketing costs in developed fertilizer markets in Asia ranged around US$ 30/t, compared to the Egyptian costs of around US$ 10/t[3]. The ratio to product cost in Egypt is, however, similar to that in other countries and low costs while laudable are not necessarily all good. The lack of maintenance and storage facilities in the PBDAC system is a contributing factor to the low costs, but is a situation that has to be addressed.

Fertilizer Prices, Subsidies and Margins

Fertilizer Prices

Fertilizer prices are recommended by the PBDAC Fertilizer Use Committee and GAASF and approved by the High Policy Committee each year. The official prices are published through PBDAC decrees and consist of two price lists, subsidized and unsubsidized prices.

The development of prices is shown in Table V-7. It can be seen that after a period of no price increases for five years the subsidized prices started to increase in 1987-8 as the GOE started to implement a policy of subsidy reduction. Prices were increased in March, 1988 and again in August, 1988. The first increase was associated with the change in the method of subsidy payment, when all direct subsidy payments were made to PBDAC and no longer split between the factories and PBDAC, and when energy costs to the manufacturers were increased.

The second increase was part of the subsidy reduction program. When the subsidized prices are compared to the unsubsidized prices

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[3]) FADINAP, Survey of Fertilizer Marketing Costs and Margins in Asia and the Pacific Region,1986-7, Agro-Chemicals News in Brief,Vol XI,,2, April, 1988.

it is seen that over the past seven years there has been a marked change in the relationships of the two price sets. The unweighted average subsidized price for nitrogen (expressed as LE / kg N) was 60% of the unsubsidized price in 1982-3, then declined to about 40% for the next three years, and has since recovered to 64%. A similar pattern exists for phosphate but at a higher level of subsidization. Subsidized potash prices have, however, remained at approximately 27% of the unsubsidized price. (See Table V-8).

The method of setting the unsubsidized prices is unclear. It is related to the actual costs of procurement but not directly so. The subsidized price levels are in theory set after consideration of farm enterprise profitability but in practice the availability of funds for subsidization appears to have been the overriding factor.

Retail prices for all products are the same throughout the country, a policy which involves equalization of product pricing from different factories and transportation subsidization.

Until 1987-8 the unit prices (i.e. price per kg of nutrient) was basically equalized for nitrogen and phosphate products. Irrespective of product form the subsidized retail price for N was 27p/kg for the four years to 1987/88 with the exception of CN at 31p/kg N, and the equivalent price for P2O5 was 20p/kg. The changes in retail pricing in the past two years have abandoned this policy (See Table V-9) but the impact of both the old and new pricing structures has been to distort the product preferences of farmers.

The traditional preference of farmers for CAN was reinforced by the old pricing policy when CAN could be purchased at the same price as urea per kg of N. This situation is now further distorted as AN is available at 26% below the urea price per kg N due to a much higher level of subsidy on AN. As the cost of urea production in Egypt is on a par with world production costs and these production costs per unit of N are below those of AN, the use of urea is being discriminated against. If the retail prices of urea and AN reflected the cost of production, the urea price per unit of N would be approximately 39% below that of AN. On this basis farmers could use urea, making allowance for lower efficiency under given circumstances, and the degree of product substitution and preference of one product over another would be diminished. This interaction of price and product substitution is not manifested under the controlled allocation system of fertilizer supply today, but it needs to be taken into account in rationalizing the pricing system.

With the changed policies of the GOE with respect to both input and output prices a dual situation has arisen with regard to fertilizer-crop price ratios. For the crops in which the output prices have been decontrolled the price ratios with fertilizers have improved, but for the controlled crops (cotton, rice and

sugar) the situation has deteriorated in the past two years, exacerbating the production problems with these crops. Selected price ratios are provided in Table IV-10.

The actual prices paid by farmers for fertilizers differ from the official retail prices. In the first place all farmers are entitled to an allocation of fertilizers based on the official requirements for their approved cropping programs. PBDAC charges an additional LE 4.5/t for freight to the mandubias above the retail price list and a small levy for the MOA extension agents social services fund. This levy is calculated as 50 piastres per 15.5% nutrient content of the product. The levy is therefore 50p for CN, LE 1.08/t for AN, and LE 1.48/t for urea. Further small levies are also added to the prices as a form of governorate level taxation. These vary from governorate to governorate.

The Credit and Agrarian Reform Cooperatives are entitled to a 5% discount from the official prices, a concession which was introduced in 1986-7 following pressure from the cooperatives. In 1987-8 approximately 80% of all sales made by PBDAC went to cooperative members. The discount is used by the cooperatives as a source of funding, although it is officially a compensation for the cost of distributing ferilizers. In practice only 280 cooperatives were actually performing this role in 1987-8.

In theory farmers are entitled to their allocations of subsidized fertilizers according to their cropping patterns and the official recommended needs per feddan; they may then purchase additional quantities at unsubsidized prices if supplies are available. In practice it appears that very little, if any, fertilizer is purchased from PBDAC at unsubsidized prices due to lack of supplies and the operation of a thriving black market at price levels between the subsidised and unsubsidized prices.

Fertilizer Subsidies

Historically the fertilizer subsidies have fallen into seven categories:

1. Indirect production subsidies via energy pricing;
2. Direct production cost subsidies;
3. Direct distribution product subsidies;
4. Direct freight subsidies, included with category 3 above;
5. Indirect freight subsidies via energy pricing;
6. Indirect subsidies through preferential exchange

rates for imports; and

7. Direct distribution subsidies for cooperatives.

Neither the indirect subsidies on domestic production nor those on transport costs will be considered here as they are not sectorially specific.

The direct production cost subsidies paid to the factories were transferred to direct distribution product subsidies paid to PBDAC in January,1988.

These direct distribution product subsidies include an element of subsidy applicable to the product cost, the difference between ex-factory and retail prices, and an element of freight cost subsidy as farmers do not pay for the cost of delivery into the governorates. These are not separated as such in the method of calculation or payment. The calculation of these subsidies is made as follows:

1. The cost of procurement is adjusted for stock changes by PBDAC;

2. The 16.5% PBDAC commission is added to the net procurement cost;

3. The net revenue from product sales to farmers is deducted from the above costs; and

4. The resultant value is the subsidy entitlement.

The subsidy thus includes an element of product cost subsidy and an element of transport subsidy to the primary distribution points. The calculation for 1987-8 is shown below:

Opening Inventory	39.9 million LE
Domestic Purchases	348.9
Import Purchases	46.1
Closing Inventory	77.3
Cost of Product	357.6
PBDAC Commission	47.5
Sub Total	405.1
Net Sales Value	270.8

Subsidy Paid	126.5

The GAASF administers the subsidy funds. It receives on a monthly basis the budgeted subsidy amount from the Ministry of Finance and it holds these funds until after auditing the PBDAC accounts each quarter; and it then authorizes the payments to PBDAC. The subsidy payments made in this way are paid only on the actual amounts of fertilizers distributed to farmers each quarter. As PBDAC has to pay the factories on a monthly basis and take delivery of all production on a continuing basis, whether or not sales keep up with receipts, this system adds to the working capital requirements of PBDAC. At the same time funds for subsidy payments are held by the GAASF. This system could be improved.

It was not possible to reconcile the above subsidy calculation, based on PBDAC's records with data from the GAASF for 1987-8. In part this may have been due to changes in procedures during the year and in part to lack of sufficiently detailed data on the value of PBDAC's stocks and procurement costs during the year. The data supplied by the GAASF for 1987/88 gave the total subsidy paid to PBDAC as LE 129 million, LE 25 million on imported products and LE 104 million for domestic products. In addition the factories were paid LE 107 million up to 31 December but this included approximately LE 37 million for under-payments in previous years. The total direct product cost and distribution subsidy for 1987-8 was therefore in the order of LE 199 million.

In addition to this direct subsidy PBDAC is also paid a rebate for the sales made to cooperative members to compensate in full for the 5% discount given to these farmers. The rationale for this is that the cooperatives receive the discount to enable them to distribute the fertilizer. The actual distribution function, however, is performed by PBDAC and therefore the organisation is compensated. In 1987-8 this rebate was LE 11 million.

The total cost of imported fertilizers sold by PBDAC in 1987/88 was LE 46.1 million. If, as noted earlier, the preferential exchange rate had not been applied the cost would have been LE 119.7 million. There was therefore an indirect subsidy of LE 74 million on imports.

In summary the 1987-8 fertilizer subsidy amounted to LE 284 million, as follows:

Direct production subsidy	70 million LE
Direct distribution subsidy	129
Cooperative rebate	11
Sub total Direct subsidies	210

Indirect Import subsidy	74
Total	284

The subsidy situation in 1987-8 was complicated by the transition from one payment method to another, by retail price changes, and by ex-factory price changes. To clarify the issue estimates of the subsidy per product and per source of supply have been made based on the current retail prices, current ex factory prices, and actual import costs at the preferential exchange rate for the 1987-8 sales quantities. These calculations are detailed in Table V-11 and show that the existing price structure has gone a long way towards reducing the direct subsidies on fertilizers.

The direct subsidy on imports would have been LE 10.5 million, on domestic products LE 35.8 million, and the cooperative rebate of LE 19.2 million, a total of LE 65.5 million. This is the approximate level of subsidy that will be required in 1988-9, given that sales will be similar to last year's.

The subsidy on imports is limited to potassium sulfate and is at a high level on this product LE 171/t. Of the domestic nitrogen products, urea is unsubsidized, as is most of the ammonium sulfate with only the small annual production at Helwan being subsidized at the rate of around LE 14/t. The ammonium nitrate from all plants is subsidized, from LE 30-44/t, except for Talkha which only requires a subsidy of LE 4.5/t at current prices and costs. The superphosphate products are all subsidized, single superphosphate at LE 15-20/t and triple superphosphate at LE 46/t. The average subsidy for all these products is 10.8%.

This reduced subsidy level will, however, be eroded by the proposed increases in ex-factory prices for 1989-90, which will increase total product cost by 43 %. These increases without any corresponding increase in retail prices would raise the subsidy to about LE 230 million for a full year. If the subsidy was maintained at LE 46.3 million the following price changes would have to be implemented:

Product	Current		New	% Increase
	Subsidy	Price	Price	in Price
	(LE M.)	(LE/t)	(LE/t)	
CN	3.7	84.00	140.80	67 %

CAN	8.3	98.00	170.60	74 %
AN	2.6	141.00	189.40	34 %
Urea	0.0	263.00	263.00	0 %
AS	0.1	127.00	144.00	13 %
SSP	16.3	71.00	163.00	129 %
TSP	4.8	188.00	423.00	125 %
SP	10.5	57.00	221.00	288 %

For full subsidy removal the prices would have to be increased as follows:

Product	Current price (LE / ton)	New Price	% Increase
CN	84.00	158.50	89 %
CAN	98.00	193.20	97 %
AN	141.00	204.40	96 %
Urea	263.00	263.00	0 %
AS	127.00	149.30	18 %
SSP	71.00	191.40	170 %
TSP	188.00	497.00	164 %
SP	57.00	272.30	378 %

The above estimates are only in respect to the direct subsidies and do not alter the current situation with regard to the preferential exchange rate subsidy for imports.

Fertilizer Margins

PBDAC operates as would a consignment agent, taking commissions from sales of distributed product. The commission is calculated at 16.5 % of the official retail prices and has to cover the operating and overhead expenses of its fertilizer operations. As stated earlier, PBDAC's total expenses allocated to fertilizers were LE 9.84/t in 1986-7 and LE 11.51/t in 1987-8. The total commissions in 1987-8 were LE 49 million, with a further LE 11

million from the cooperative rebate and other income of LE 2 million. This represented an income per ton distributed of LE 17.76 and provided a net profit before tax of LE 6.24/t. This compared to LE 6.07/t in the previous year. There is no pricing structure for wholesale pricing or discounts to retailers, as PBDAC sells only at the retail level from the mandubias.

If PBDAC were considered as a Merchant Agency and allowance were made for product losses, the distribution/marketing costs would approximate LE 25/t, as shown in Table V-5.

Based on the current ex factory and retail prices, it is calculated that at the 1987-8 sales level PBDAC's income per ton will rise to LE 29.5 and the net profit before tax to LE 16.6/t. The details of these calculations are shown in Table V-11 and include increased commissions and cooperative rebates due to the higher retail prices and increased financing costs owing to the higher level of working capital required. Obviously as retail prices are increased, as the subsidy reduction policy continues, the current formula for calculating PBDAC's commission is going to provide windfall profits. This situation is one in urgent need of review.

Private Sector Involvement in Fertilizer Marketing

From 1976 until 1988 PBDAC had by law a complete monopoly on fertilizer procuremnt and distribution. In January, 1988, the law was ammended to provide the private sector with access to importation of fertilizer and its distribution, but no changes were made to PBDAC's monopoly on purchase and distribution of domestic fertilizer supplies.

The fact that the private sector has not taken advantage of the changed regulations is due to the following discriminations against private sector companies:

- There is no entitlement to preferential exchange rates;
- At least 25 % of the foreign exchange for imports must be supplied from the importers own sources as an advance payment;
- No subsidy is applicable to private sector imports;
- No freight subsidy is applicable;
- There is no well established distribution system outside PBDAC;
- Access to working capital is limited for both the potential national distributors and potential

retailers; and

- There are numerous and complicated permissions to be obtained before importation is allowed.

Under these circumstances the private sector is not able to compete with PBDAC for market share of the main stream products. The limited experience of the private sector to date is that under the current conditions it will not particpate in the fertilizer market in competion with PBDAC to any perceptible degree. This is not to say that the private sector has lost all interest in particpating in the market. Interested parties are merely waiting for the GOE to provide the opportunity for them to particpate under equal terms with PBDAC. Given such circumstances the private sector has expressed interest in establishing distribution networks, though not necessarily as extensive as PBDAC's.

The private sector has particpated in the fertilizer market in specialized areas outside the main stream of PBDAC's activities, with one exception. The exception involved the importation of 6,000 tons of ammonium nitrate in 1987-8. This proved to be a salutory experience for the company involved: the importation was delayed because an original joint agreement with a public sector was cancelled by the public company; and the black market operators proved to be extremely well organised and reduced prices as soon as the shipment's arrival and product price were advertised. As a result of the combination of timing and price competition only about 10% of the shipment was sold immediately and the rest of the shipment was sold about eight months later at a loss to a dealer in Upper Egypt.

Two companies have been involved with the importation and distribution of small quantities of specialized fertilizers for drip irrigation in new land areas in association with PBDAC. In 1986-7 the Dutch government donated 1,500 tons of four NPK plus trace element mixtures suitable for drip irrigation. Apparently the interest in these products arose from the specialized needs of one of the private sector companies which purchased small quanties for its own use. The GOE authorized PBDAC to sell the donated fertilizer at unsubsidized prices through the private sector. These companies in turn added a mark up, beleived to be around 20%, to arrive at a retail price.

These fully soluble fertilizers, packaged in 20 and 25 kg bags, were finally retailed for between LE 2,000 and 2,500 / ton. The technology involved in utilizing these products needed to be developed under Egyptian conditions and at least one of the private sector companies involved is employing ten agronomists to assist in sales development of these fertilizers in four governorates. The products have been applied using fertigation techniques in which 1 gr/l is applied through the drip irrigation system, providing around 30 kg/fd for vegetable crops during the crop season. The

company is providing soil-and tissue-testing analysis services to farmers to ensure the optimum fertilizer applications. In addition to the NPK trace element mixtures the fertilizer programs are supplemented with ammonium nitrate; reportedly the field responses have been well above normally expected levels for new land areas. At LE 2.00/kg and recommended use levels of 30 kg/fd these fertilizers are economical compared to the traditional fertilizer programs used on these coarse textured soils, where fertilizer and water use efficiency tend to be very poor.

In July 1988, a new private sector company was established for the production and marketing of blended NPK mixtures with trace element additions, primarily for vegetable crops. Nine mixtures are marketed. Again this is a new concept to Egyptian agriculture. Although the relative merits of blended mixtures over the use of straight fertilizers in the Egyptian context is debatable, it would appear that the convenience factor is being well received by the limited number of farmers supplied to date. Due to the absence of subsidy these products are priced well above the equivalent straight materials, and there are technical defects arising from the use of CAN and TSP in blends. It should be noted that the domestic TSP cannot be used in blends as it is not granulated and has a high free acid content, which would add to the bag set problems which are being experienced. The answer to these quality problems will require the use of monoammonium phosphate as the phosphate source. The blending plant has a capacity of 20,000 t/a on a single shift basis and could be used, according to the company, for producing up to 40,000 tons per annum.

The other private sector involvement in fertilizers is the involvement of several companies in the importation and supply of trace elements and foliar fertilizers in various forms. At least one company is planning to establish its own analytical laboratory for soil and plant analysis to assist in developing its services and product sales to farmers.

It can be seen, therefore, that although private sector involvement in fertilizers is very limited to date there is an active interest and ability in increased participation, not only in the specialised areas but also in the straight nitrogen, phosphate, and potash products. Under the current circumstances the private sector is mainly using the PBDAC distribution system, but the interest exists for the development of a parallel alternative system given the right conditions.

The Black Market

There is a lack of information on the black market, in spite of the fact that it has long been recognized as an active component of the fertilizer distribution and marketing process. The most detailed and recent information is contained in the SPAAC

previously cited surveys made in 1985-6.

The black market in fertilizers is a redistribution system amongst farmers of the offical allocations for an apparent variety of reasons. The SPAAC report made the following points from the surveys of farmers in Upper and Lower Egypt:

- Fertilizers are transferred from one crop to another;
- Fertilizers are sold from one farmer to another;
- Fertilizers are sold from village to village;
- Fertilizers are sold across governorate borders;
- Average prices in the free market vary between two and three times the official retail prices;
- The largest profit from the trade is made by farmers;
- The reasons for selling allocations are the need for cash and the availability of excess individual allocations;
- When sold for cash needs fertilizer is usually bought back, in part or completely, when required;
- Excess amounts arise because: (a) farmers believe that some crops are assigned higher amounts than needed; (b) some farmers rent out land but retain the official quotas; farmers receive fertilizer for one crop but grow another with lower requirements; and in new land areas the area cultivated is less than the area for which official quotas are issued;
- Both large and small merchants within and outside the village act as middlemen between buying and selling farmers;
- Farmers know and trust the merchants and believe that their profit margins are not excessive;
- 55% of farmers surveyed purchased over quota fertilizer; and
- Of those buying over quota fertilizer, 68% purchased at the official retail price and 32 % at a higher price.

The most important aspects of these findings are the use of the allocation and credit in kind system as a source of short- term cash credit; the revealed weaknesses in the allocation system; the impact on the average cost of fertilizer to farmers; and the presence of both informal and formal retail systems at the local level.

A farmer buying fertilizer using in kind credit is invoiced with the cost of fertilizer plus 3.5% for winter crops, plus 4% for summer crops, and plus 2.5% for purchases between 1 July and 1 October. The winter crop loans are made from October 1 and have to be repayed within nine months or prior to the next application for in kind credit. Summer crop loans are made from March 1st and have to be repaid under the same conditions. The loans for the Nile season crops are for a maximum of four months. This subsidized credit provides farmers with a very attractive form of short term cash loans and profit if the fertilizer is sold to the black market. A ton of AN obtained as in-kind credit in March for a total invoiced value of LE 146.64 (i.e. LE 141 + credit charge of LE 5.64) can be sold for approximately LE 198/t, equivalent to LE 11 per bag less 10% commission to a merchant or a net profit of LE 51.36/t. The utility of this profit as an immediate cash benefit can be very high and compared to commercial credit at 12-13 % interest, if available, or to informal credit sources, is very attractive.

When the comparison is made on the basis of either reducing rates of application and selling the surplus supplies or partially switching the allocation to another crop, it becomes obvious why the official allocation system does not work.

A farmer allocated 62 kg N/fd for cotton as AN would obtain a yield of 7.76 kintars/fd on the basis of the generalized response curve. At the 1988 price levels this would have been worth LE 1,146.42 / fd. Reducing the rate of application to 45 kg N/fd would have reduced the yield to 7.635 kintars / fd and the value of output by LE 18.46/fd. If the 0.06 tons of N not used were sold at LE 198/t AN (LE 591/t N) the additional revenue would have been LE 35.46, a net gain of LE 17. More importantly the net present value of the immediate cash sale of fertilizer is far higher than the cotton profit foregone seven or eight months later.

Alternatively the farmer could transfer the nitrogen from cotton to another crop. If the .06 tons of N were used on maize, increasing the official allocation from 93 kg/fd to 110 kg/fd, the additional (general response curve) yield would be 0.036 tons/fd. At 1988 prices this additional yield would be worth LE 12.85, double the income foregone from cotton but obtained at an actual cost of LE 7.43 and an opportunity cost of LE 10.05. While this would still give the farmer a better use of the nitrogen

allocation, it would be less profitable to the farmer than selling part of his fertilizer allocation.

The impact of the black market on the average price paid by farmers for fertilizer is difficult to measure, but it has implications for the impact of fertilizer price rises, either from reduction or removal of the subsidy or from cost increases. The following assumptions are made for the purpose of calculating the average price paid for both nitrogen and phosphate, expressed as LE /ton nutrient:

1. 25% of all fertilizers are resold on the black market;

2. The black market prices averaged twice the official retail prices until 1988-9 and then one and a half times;

3. The farmer price for official allocations is the official retail price plus LE 4.5/t distribution charge plus the levy;

4. 1% of official sales are at unsubsidized prices; and

5. The average cost is based on the weighted product mix.

On the basis of the foregoing assumptions, the average costs to farmers for nutrients compared to the weighted official prices have been:

Year	Official Prices (Piasters/kg)			Average Cost (Piasters/kg)		
	N	P2O5	K2O	N	P2O5	K2O
1988-9	50.28	48.89	12.16	69.54	67.29	18.92
1987-8	33.09	29.77	12.16	50.16	44.39	18.92
1986-7	28.98	22.32	12.16	43.56	33.13	18.91
1985-6	28.18	21.10	12.16	42.36	31.20	18.91
1984-5	28.21	22.22	12.16	42.22	32.57	18.92
1983-4	28.16	21.98	12.16	42.17	32.31	18.92
1982-3	26.15	21.36	12.16	39.09	31.42	18.91

The 1988-9 estimates are based on the same product mix as the previous year's. The assumption that black market prices have fallen to a 1.5 multiple of the official retail prices take account

of the increases in the retail prices and maintain the black market prices below the unsubsidized levels.

The calculations indicate that the average cost of fertilzer nutrients has been almost 50% higher than the official retail prices and that they may now be around 38% of official prices based on the 1.5 multiple assumption for black market prices.

In calculating the impact of subsidy removal on farm costs it is contended that the above average weighted prices should be used as a bench mark, as they more closely resemble the current costs to farmers than the official prices.

The final aspect of the black market is the role played by dealers. The extent of this role is not kmown but some broad generalisations may be postulated. Of the 3.5 million tons of fertilizer annually distributed by PBDAC, it may be assummed that 25% is resold on the black market and that half of this quantity is traded through dealers or large farmers acting as dealers. This would amount to almost 0.5 million tons per annum. With around 4,500 village communities the presence of one dealer per village would indicate an average trade of 100 tons per dealer per annum. There would be a wide range in the scale of these activities, but it seems unlikely that there are very many dealers operating on the scale of a PBDAC mandubia. Limited experience in the private sector has been that these dealers are interested generally in quantities of fifty to several hundred tons at a time but for the most part are under capitalized. The important point is that they are present in the market place, they probably have access to limited storage facilities, they have access to transport, and they have contact with farmers. Potentially these dealers are a nucleus for private sector retailing of fertilizers. If the black market is eliminated they presumably will be looking for alternative and legimate business activity.

Table V-1

PBDAC Shounas and Mandubias, By Governorate

Governorate	No. of Shounas	No. of Mandubias	Total Storage Capacity ('000 tonnes)	1987/88 Sales	Ratio Sales: Storage
ALEXANDRIA	14	4	5.3	77.2	14.6
BEHEIRA	42	411	50.5	464.7	9.2
GHARBIA	46	303	27.6	236.5	8.6
KAFR EL SHEIK	34	237	72.9	199.6	2.7
DAKAHILA	47	447	92.2	255.2	2.8
SHARKIA	56	457	33.9	337.0	9.9
ISMAILIA	9	32	6.0	83.4	13.9
DAMIETTA	10	71	6.8	41.2	6.1
MENOFIA	37	318	46.4	260.8	5.6
KALUBIA	15	209	8.3	139.6	16.8
CAIRO	1	2	.0	7.0	N/A
GIZA	20	181	12.9	156.5	12.1
BENI SUEF	26	221	17.8	126.6	7.1
FAYOUM	24	169	12.7	137.5	10.8
MINYA	62	350	59.1	243.2	4.1
ASSIUT	32	215	23.8	151.1	6.3
SOHAG	22	202	16.3	136.1	8.3
QENA	20	217	36.5	262.7	7.2
ASWAN	5	88	16.3	103.2	6.3
EL ARISH	4	2	9.9	1.4	.1
PORT SAID	2	1	.2	.0	.0
SUEZ)	12	1	2.1	.0	.0
SOUTH SINAI)		2	.4	.0	.0
NEW VALLEY	5	2	.0	7.2	N/A
TOTAL	545	4252	557.9	3427.7	6.1

Source: PBDAC

Table V-2

Budget Freight Costs to Governorates, 1989-90

Company	Product	Tons ('000)	Freight Cost (LE/tonne)	Total Cost (LE millions)
SEMADCO	CAN	235	7.50	1.763
	AS	50	7.50	.375
	AN	280	7.50	2.100
	Urea	450	7.50	3.375
Abu Qir	Urea	460	12.00	5.520
El Nasr	AS	10.5	8.00	.084
	AN	55	8.00	.440
Kima	AN	250	4.00	1.000
Abu Zaabal	SSP	280	5.00	1.400
	TSP	120	5.00	.600
EFIC	SSP	650	5.00	3.250
Imports	AS	255	10.00	2.550
	AN	60	10.00	.600
TOTAL		3175	7.32(ave.)	23.257

Source: PBDAC.

Table V-3

Consolidated Accounts, PBDAC 1986-7

Fertilizers

	(LE Millions)				LE
Revenue	DIRECT	INDIRECT	TOTAL	PERCENT	PER TON
Commissions @ 16.5 %			46.100	84.38%	13.42
Distribution Commission			.000	.00%	.00
New Jute Bags			.327	.60%	.10
Rounding			.000	.00%	.00
Cooperatives Rebate			8.207	15.02%	2.39
Administration Fines			.000	.00%	.00
Sub-Total			54.634	100.00%	15.91
Less Excess Commissions			.000	.00%	.00
Total			54.634	100.00%	15.91
Expenses					
Bab I (Personel)	18.702	3.385	22.088	65.38%	6.43
Bab II					
A Goods	.218	.070	.288	.85%	.08
B Services	3.106	.398	3.504	10.37%	1.02
C Current Transfers					
1. Taxes & Fees on Commod	.028	.011	.039		.01
2. Depreciation	.851	.125	.976		.28
3. Rent	.365	.013	.378		.11
4. Int.& Finance Expenses	5.299	.234	5.533		1.61
6. Interest on Bonds	.000	.006	.006		.00
10. Other Transfers	.000	.000	.000		.00
Sub-Total	6.543	.389	6.932	20.52%	2.02
D.Sp.Current Transfers	.511	.462	.973	2.88%	.28
Total Bab II	10.378	1.320	11.697	34.62%	3.41
Total Bab I & Bab II	29.080	4.705	33.785	100.00%	9.84
Net Income			20.849		6.07

Source: PBDAC.

Table V-4

Consolidated Accounts, PBDAC 1987-8

Fertilizers

	(LE Millions)				LE
Revenue	DIRECT	INDIRECT	TOTAL	PERCENT	PER TON
Commissions @ 16.5 %			47.019	75.85%	13.47
Distribution Commission			2.045	3.30%	.59
New Jute Bags			.980	1.58%	.28
Rounding			.924	1.49%	.26
Cooperatives Rebate			11.224	18.11%	3.22
Administration Fines			.001	.00%	.00
Sub-Total			62.194	100.33%	17.82
Less Excess Commissions			(.207)	-.33%	-.06
Total			61.987	100.00%	17.76
Expenses					
Bab I (Personel)	22.661	3.693	26.354	65.56%	7.55
Bab II					
A Goods	.183	.079	.262	.65%	.07
B Services	3.704	.489	4.193	10.43%	1.20
C Current Transfers					
1. Taxes & Fees on Commod	.048	.017	.064		.02
2. Depreciation	1.125	.207	1.332		.38
3. Rent	.471	.017	.487		.14
4. Int.& Finance Expenses	6.587	.208	6.794		1.95
6. Interest on Bonds	.000	.008	.008		.00
10. Other Transfers	.000	.000	.000		.00
Sub-Total	8.230	.456	8.687	21.61%	2.49
D.Sp.Current Transfers	.247	.458	.705	1.75%	.20
Total Bab II	12.364	1.482	13.847	34.44%	3.97
Total Bab I & Bab II	35.025	5.175	40.201	100.00%	11.51
Net Income			21.786		6.24

Source: PBDAC.

Table V-5

PBDAC Distribution and Marketing Costs, 1987-8

	Total (LE millions)	Per tonne (LE / t)
Opening Inventory	39.93	11.44
Purchases - Domestic	329.50	94.37
Purchases - Imports	42.94	12.30
Closing Inventory	77.27	22.14
Cost of Product	335.09	95.97
Marketing Expenses		
Freight - Inter Gov'n.	22.53	6.46
Freight - Intra Gov'n.	15.71	4.50
Finance	6.81	1.95
Promotion	4.19	1.20
Other	29.20	8.36
Losses est. @ 3%	10.05	2.88
Total Marketing	88.49	25.35
Total Cost	423.58	121.34

Table V-6

Estimated Consolidated Accounts, PBDAC 1988-9

Fertilizers

	(LE Millions) DIRECT	INDIREC	TOTAL	PERCENT	LE PER TON
Revenue					
Commissions @ 16.5 %			81.474	79.20%	23.34
Distribution Commission			.000	.00%	.00
New Jute Bags			.980	.95%	.28
Rounding			1.567	1.52%	.45
Cooperatives Rebate			19.053	18.52%	5.46
Administration Fines			.001	.00%	.00
Sub-Total			103.078	100.20%	29.53
Less Excess Commissions			(.207)	-.20%	-.06
Total			102.871	100.00%	29.47
Expenses					
Bab I (Personel)	22.661	3.673	26.353	58.65%	7.55
Bab II					
A Goods	.183	.077	.261	.58%	.07
B Services	3.704	.487	4.193	9.33%	1.20
C Current Transfers					
1. Taxes & Fees on Commod	.048	.017	.064		.02
2. Depreciation	1.125	.207	1.332		.38
3. Rent	.471	.017	.487		.14
4. Int.& Finance Expenses	11.325	.208	11.533		3.30
6. Interest on Bonds	.000	.008	.008		.00
10. Other Transfers	.000	.000	.000		.00
Sub-Total	12.969	.456	13.425	29.88%	3.85
D.Sp.Current Transfers	.247	.458	.705	1.57%	.20
Total Bab II	17.102	1.481	18.583	41.36%	5.32
Total Bab I & Bab II	39.763	5.174	44.937	100.00%	12.87
Net Income			57.954		16.60

Source: PBDAC.

Table V-7

Development of Fertilizer Retail Prices

	1983-4	1984-5	1985-6	1986-7	1987-8 (1/3/88)	1987-8 (18/8/88)
Subsidised Prices	(LE/t)					
Urea 46%	126.80	126.80	131.00	131.00	151.00	263.00
AN 33.5%	91.20	91.20	91.20	91.20	108.00	141.00
CAN 31%	84.5	84.5	88.5	88.50	98.00	98.00
CN 15.5%	47.70	47.70	47.70	47.70	47.70	84.00
AS 20.6%	57.90	57.90	57.90	57.90	74.00	127.00
SSP 15.5%	30.30	30.30	30.30	30.30	42.00	71.00
DSP 37.5%	-	-	-	75.00	104.00	188.00
TSP 44%	86.80	86.80	86.80	86.80	86.60	86.80
PS 48%	57.00	57.00	57.00	57.00	57.00	57.00
Unsubsidised Prices						
Urea 46%	213.70	226.17	226.17	226.17	246.17	293.20
AN 33.5%	182.60	277.54	277.54	283.20	283.20	283.20
CAN 31%	182.9	182.9	182.9	182.9	262.20	262.20
CN 15.5%	74.70	117.24	117.24	117.24	131.00	131.00
AS 20.6%	121.30	221.28	221.28	221.28	221.30	221.30
SSP 15.5%	73.80	142.70	142.70	142.70	142.90	142.90
DSP 37.5%	-	-	-	301.00	301.00	301.00
TSP 44%	217.50	189.62	189.62	189.62	321.00	321.00
PS 48%	57.00	57.00	57.00	57.00	57.00	57.00

Source: PBDAC.

Table V-8

Development of Fertilizer Retail Prices per Kg Nutrient

	1983-4	1984-5	1985-6	1986-7	1987-8 1/3/88	1987-8 18/8/88
Subsidised Prices						
	(Piastres/kg)					
Urea 46%	.28	.28	.28	.28	.33	.57
AN 33.5%	.27	.27	.27	.27	.32	.42
CAN 31%	.27	.27	.29	.29	.32	.32
CN 15.5%	.31	.31	.31	.31	.31	.54
AS 20.6%	.28	.28	.28	.28	.36	.62
SSP 15.5%	.20	.20	.20	.20	.27	.46
DSP 37.5%	-	-	-	.20	.28	.50
TSP 44%	.20	.20	.20	.20	.20	.20
PS 48%	.12	.12	.12	.12	.12	.12
Subsidised Prices						
Urea 46%	.46	.47	.47	.47	.54	.64
AN 33.5%	.55	.83	.83	.85	.85	.85
CAN 31%	.59	.59	.59	.59	.85	.85
CN 15.5%	.46	.76	.76	.76	.85	.85
AS 20.6%	.59	1.08	1.08	1.08	1.08	1.08
SSP 15.5%	.48	.92	.92	.92	.92	.92
DSP 37.5%	-	-	-	.80	.80	.80
TSP 44%	.49	.43	.43	.43	.73	.73
PS 48%	.12	.12	.12	.12	.12	.12

Source: PBDAC.

Table V-9

Unweighted Average Nutrient Prices For Subsidised Fertilizers as Percentages Of Unsubsidised Prices

Year	N	P2O5	K2O
1982/83	60%	43%	27%
1983/84	44%	30%	27%
1984/85	41%	31%	27%
1985/86	40%	34%	27%
1986/87	61%	40%	27%
1987/88	61%	40%	27%
1988/89	64%	43%	27%

Table V-10

Estimated Fertilizer Subsidy at Current Prices

Based on 1987/88 Sales Tons

(LE/Ton)

PRODUCT	TONNES	COST	COMMISSION	SUB TOTAL	REVENUE	SUBSIDY
IMPORTS						
AS	276625	99.88	20.96	120.84	121.92	-1.09
AN	90308	94.84	23.27	118.11	135.36	-17.26
PS	61440	216.47	9.41	225.88	54.72	171.16
TSP	1001	172.37	31.02	203.39	180.48	22.91
U	448	123.88	42.74	166.62	248.64	-82.03
DOMESTIC						
CN	246494	81.80	13.86	95.66	80.64	15.02
AS	11613	114.74	20.96	135.70	121.92	13.78
AS	62544	98.43	20.96	119.39	121.92	-2.54
AN	49198	156.27	23.27	179.54	135.36	44.18
AN	84331	116.63	23.27	139.90	135.36	4.54
CAN	248511	82.98	16.17	99.15	94.08	5.07
U	524798	180.60	42.74	223.34	248.64	-25.31
CAN	285000	102.67	16.17	118.84	94.08	24.76
AN	1136	144.55	23.27	167.82	135.36	32.46
U	432350	187.21	43.40	230.61	252.48	-21.88
SSP	262494	76.22	11.72	87.94	68.16	19.78
SSP	364729	71.23	11.72	82.95	68.16	14.79
SSP	384796	71.23	11.72	82.95	68.16	14.79
DSP	102939	195.50	31.02	226.52	180.48	46.04
TOTAL	3490755					

(LE Millions)

IMPORTS					
AS	27.629	5.797	33.426	33.726	.000
AN	8.565	2.101	10.666	12.224	.000
PS	13.300	.578	13.878	3.362	10.516
TSP	.173	.031	.204	.181	.023
U	.055	.019	.075	.111	.000
DOMESTIC					
CN	20.163	3.416	23.580	19.877	3.702
AS	1.332	.243	1.576	1.416	.160
AS	6.156	1.311	7.467	7.625	.000
AN	7.688	1.145	8.833	6.659	2.173
AN	9.836	1.962	11.797	11.415	.382
CAN	20.621	4.018	24.640	23.380	1.260
U	94.779	22.427	117.206	130.486	.000
CAN	29.261	4.608	33.869	26.813	7.057
AN	.164	.026	.191	.154	.037
U	80.940	18.762	99.702	109.160	.000
SSP	20.007	3.075	23.082	17.892	5.191
SSP	25.980	4.273	30.252	24.860	5.393
SSP	27.409	4.508	31.917	26.228	5.689
DSP	20.125	3.193	23.318	18.578	4.739
TOTAL	414.184	81.494	495.678	474.147	46.322

Source: Team Estimates Calculated from PBDAC Data.

Table V-11

Derivation of Retail Pricing For NPK Fertilizers

Product Analysis (N-P2O5-K2O)	19-19-19	19- 9- 9	10- 5-20	13- 4-13
C & F US $	887.00	820.00	880.00	1016.00
C & F LE @1.36 Ex. Rate	1206.32	1115.20	1196.80	1381.76
Customs Duty 10%	120.63	111.52	119.68	138.18
Unloading & trans. @ 10%	120.63	111.52	119.68	138.18
Sub Total	1447.58	1338.24	1436.16	1658.11
FBDAC Commission @ 10%	144.76	133.82	143.62	165.81
Sub Total	1592.34	1472.06	1579.78	1823.92
Government Cos. Discount @ 5%	79.62	73.60	78.99	91.20
Sub Total	1671.96	1545.67	1658.76	1915.12
Distribution Bonus @ 4%	66.88	61.83	66.35	76.60
Total	1738.84	1607.49	1725.12	1991.72
Recommended Retail Price	1740.00	1620.00	1725.00	2000.00

Source: FBDAC.

Exhibit V-1

The Fertilizer Planning Process

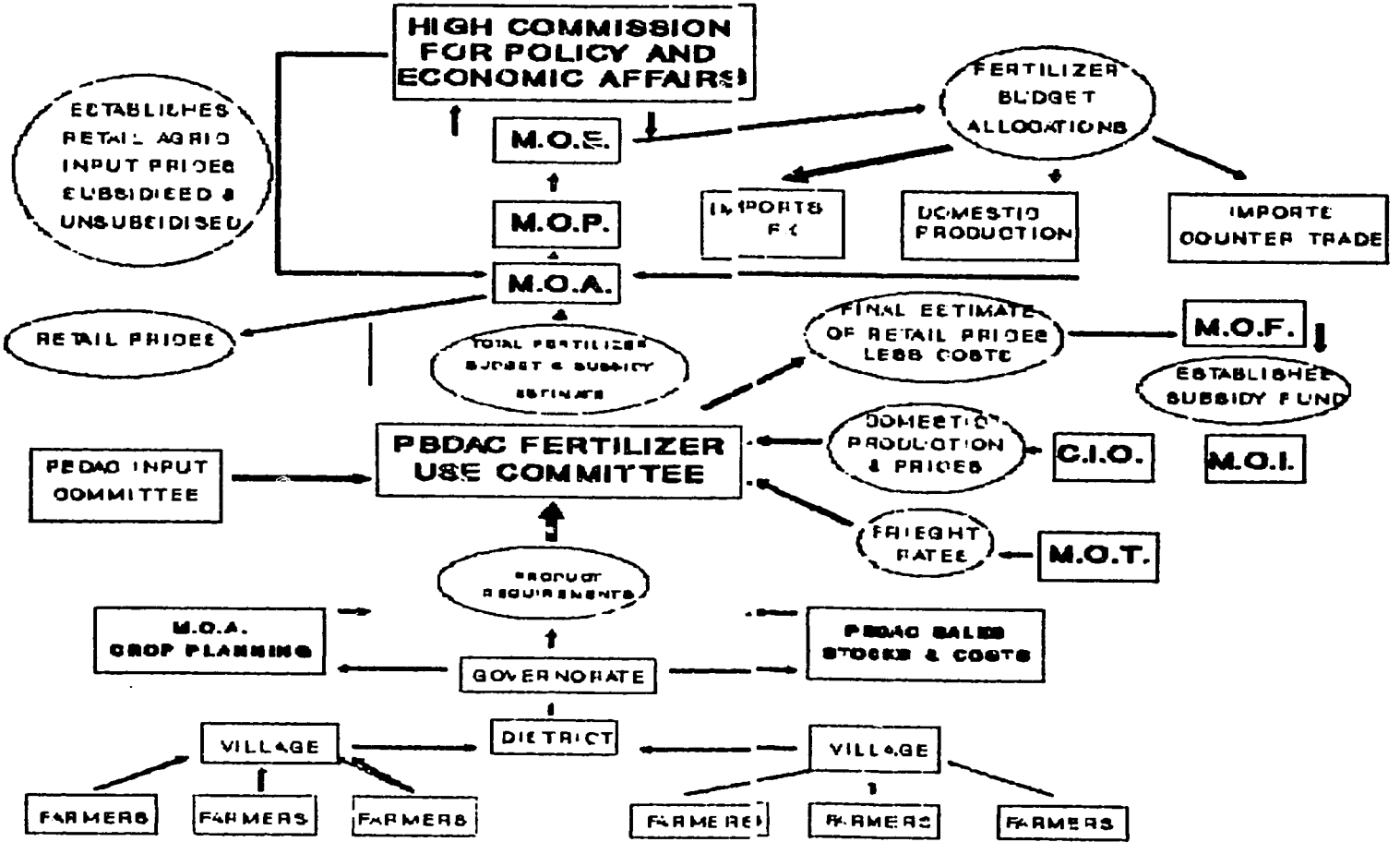


Exhibit V-2

Imported Fertilizer Procurement Process

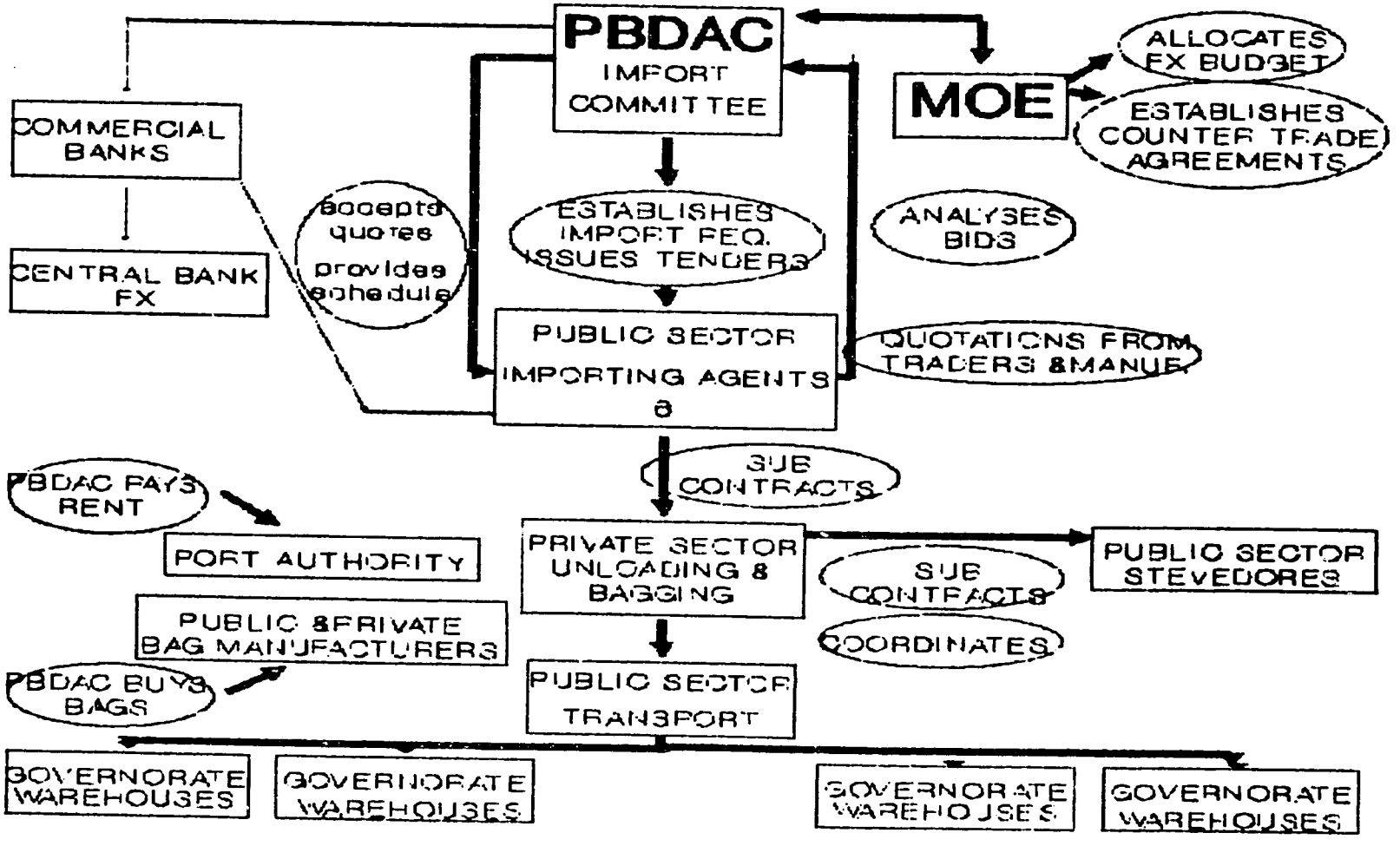
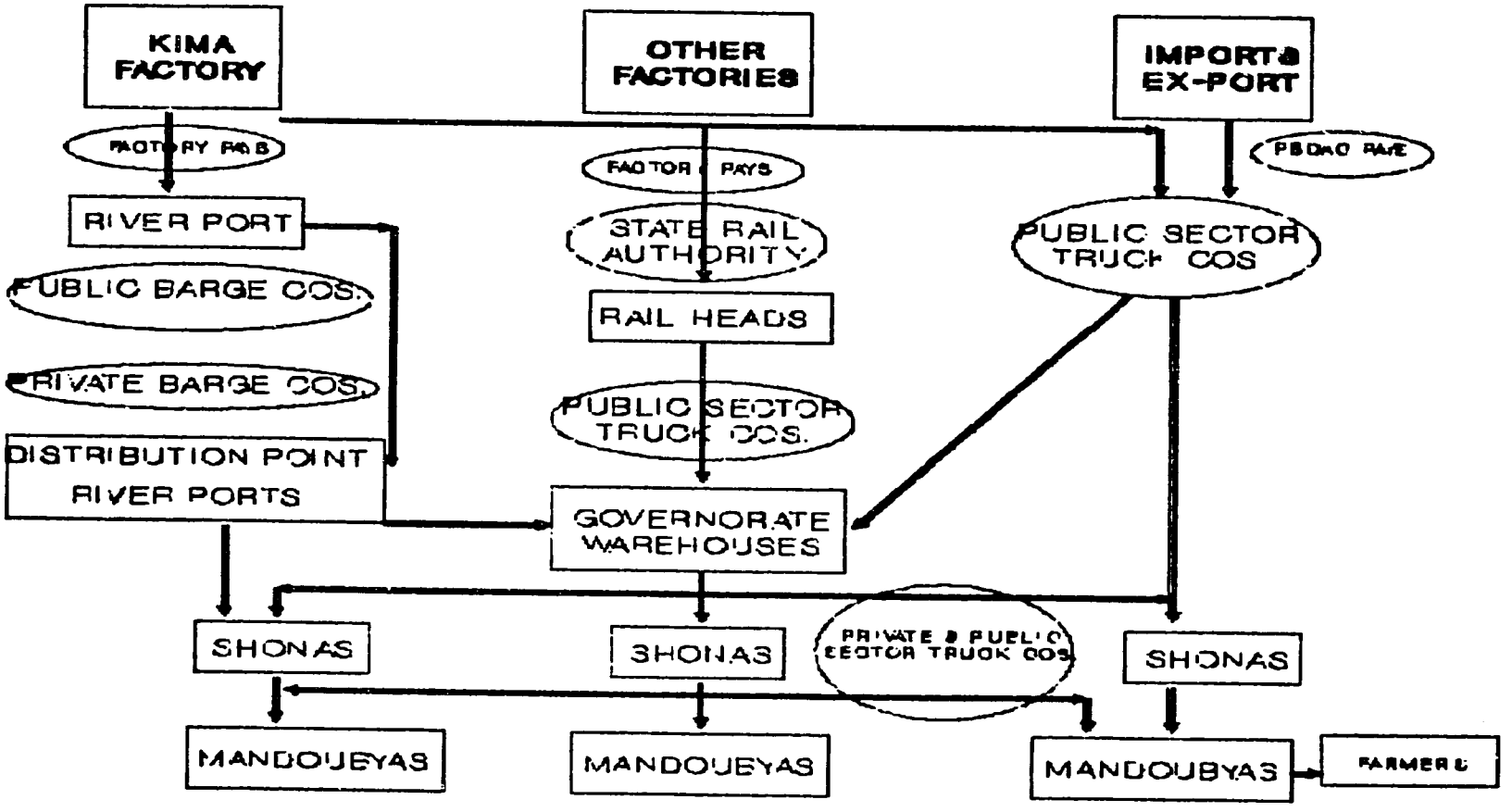


Exhibit V-3

The Fertilizer Distribution Process



VI. SUMMARY

The Egyptian fertilizer sector, for years under very stringent control and direction of the GOE, is undergoing a rapid change in policy direction that requires very careful planning and implementation of further change to ensure that its current strengths are capitalized on and its weaknesses eliminated. Satisfaction of these needs will operate to the benefit of the farmers and the nation in obtaining the greatest productivity from the limited land and water resources of the agricultural sector.

The current sector is characterized by:

- State ownership of domestic production, which accounts for 85% of the total nitrogen requirements and 100% of P2O5 requirements;
- Imports of 15% of nitrogen and 100% of potash, restricted by availability of foreign exchange;
- Local financial production costs, which are now close to world market fob prices but are distorted by subsidized energy inputs masking inefficiencies in processes, management, and raw materials;
- Well developed usage of nitrogen, almost 800,000 tons per annum, and to a lesser degree of phosphate, 190,000 tons per annum, and potash30,000 tons per annum;
- A controlled allocative distribution system through PBDAC, a government controlled credit and agricultural input distribution organization;
- A supply constrained market in which free demand factors have been distorted;
- Supply constrained by domestic production limitations and foreign exchange restrictions for importation;
- Subsidized fertilizer prices incorporating both product and distribution subsidies and equalized pricing throughout the country;
- The linkage of input supply to cash and in kind credit for cropping activities through PBDAC;
- A secondary redistribution market among farmers of subsidized fertilizers at black market prices;
- Poor efficiency in fertilizer use at the farm level

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associated with limitations in extension services, and partially associated with low fertilizer prices compared to those of other inputs;

- The decontrol of crop output prices except for cotton, sugarcane, and rice;
- A decline in the rate of growth of fertilizer usage; and
- Minimal involvement of the private sector.

The objective of this study is to explore, examine, and recommend options for privatizing the input distribution activities of PBDAC, including fertilizer. As fertilizer represents the largest non-banking activity of PBDAC a viable option for its privatization or divestment will determine to a large degree the privatization options for other inputs. Before examining these options an assessment of the strengths and weaknesses of the current system will provide a road map through the complexities that need to be negotiated in moving towards a market orientated system. Any moves towards privatization will need to be preferably beneficial and at the very least provide the minimum disruption to the established system.

Strengths of the Existing System

The greatest strength of the existing system is that it works. It may not be efficient but it ensures the access by farmers to whatever fertilizer supplies are available in a reasonable time frame.

The cropping pattern control of the MOA works to the extent of overcoming the limitations of fragmented farm holdings and providing through the official fertilizer allocations an equity of access to restricted fertilizer supplies.

The PBDAC distribution system of governorate warehouses, shounas, and mandubias provides full coverage of the total agricultural areas and ease of access to these supplies for all farmers.

The provision and linkage of non-collateral credit for fertilizer and other inputs ensures that input use is not constrained by lack of financial resources and assists in a degree of technology transfer. The system also enables a very high rate of collection to be maintained.

The existence of a sole distribution organization in conjunction with the crop planning activities of the MOA leads to a simple and straight forward planning process.

The ease of planning and the total control of the fertilizer distribution system provide the opportunity for obtaining efficiency in national distribution of both domestic and imported supplies of fertilizer. The monopoly position of PBDAC also provides economies of scale which are reflected in the low cost of distribution in comparison to other countries.

The control over both input and output prices has enabled the government to ensure that crop/fertilizer price ratios have been sufficiently attractive to encourage and develop fertilizer use.

Weaknesses of the Existing System

Despite the many strengths, summarized above, the sector suffers from many deficiencies. These arise from policy and structural deficiencies and from operational weaknesses.

In the first place, insufficient supply to satisfy demand has necessitated some form of equitable allocation of fertilizer but this has been distorted by misallocations and a generally inflexible distribution system.

There has been inadequate provision of products for specialized needs or the development of fertilizer use technology in new land areas.

There are no competition in the market for fertilizer and no alternative sources of supply. This leads to a lack of incentive to improve the level of service to farmers and also to the danger of market supply interruptions such as stock outs or lack of product choice.

The system suffers from poor product quality, particularly in regard to phosphates and end-user protection in this regard. The public sector factories, assured of selling all their production and guaranteed a given level of profit, have no incentive to improve efficiency or product and packaging quality. PBDAC has no authority to demand from domestic producers that product or packaging meet certain specifications, though it should be pointed out that attempts to do this are being made. PBDAC does have this ability with regard to imports, although constrained to some extent by the USSR protocol trade, but appears to have adopted a policy of quantity over quality in order to stretch the foreign exchange allocations. Under the prevailing circumstances this may have been the correct policy, but it has done little to improve the overall level of fertilizer quality.

Although PBDAC has the opportunity to optimize product distribution, there appears to have been little attempt to apply

pressure on domestic factories or other government authorities to utilize the lowest cost modes of transportation. This optimization opportunity may not provide large savings per ton but from a national perspective there are opportunities for considerable savings. In the latest contracts it is stipulated that 50% of product transported to Upper Egypt from the Delta has to go by rail.

The subsidized pricing system has distorted the product choice decisions of farmers while it attempted to provide incentives for nitrogen products which are technically preferable.

The restricted quantities of fertilizer available combined with the inadequacies of the allocation system have created and sustained an active black market in fertilizer that in turn raises the average fertilizer cost.

The control of credit through the provision of in-kind credit has also helped to sustain the black market as a means of acquiring low cost short-term cash credit.

The provision of fertilizer without technical advice at the point of sale, other than the official recommended rates of application, and the lack of demonstrations and field days for farmers, have added to generally inefficient utilization of fertilizer and below optimum yield achievement.

In spite of the potential benefits of national planning in achieving efficiencies in procurement, distribution, and pricing, the current system is unnecessarily complicated with bureaucratic planning and approval procedures. The increased ex factory prices and changes to the subsidy payment system in January, 1988, for example, were not fully reflected in the official retail prices until August of that year, causing a substantial and unnecessary increase in subsidy payments.

With the past restrictions on supply there has not been the necessity to develop a reliable forecasting system and none exists as such. When domestic supply is increased in 1991 from the Abu Qir plant and later from Kima, the necessity for a good demand forecasting system will be paramount.

PBDAC management information systems fail to provide analysis of individual product profitability, cost analysis of individual distribution elements, and overall financial management. This situation not only arises in part from the entirely manual record systems, but also from the lack of incentive to improve efficiencies because subsidy payments and the method of commission calculation cover all deficiencies.

Finally, PBDAC has not been encouraged or allowed to make provision for adequate maintenance of existing storage facilities

or investment in new facilities but is now considering substantial investments that may not be necessary, whether or not PBDAC maintains a monopoly position in fertilizer distribution.

Annex B

PRIVATIZATION OF AGRICULTURAL INPUTS:

ECONOMIC EFFECTS

of the

REMOVAL OF SUBSIDIES AND APPLICATION OF WORLD PRICES:

ARAB REPUBLIC OF EGYPT

APRIL, 1989

Annex B

ECONOMIC ANALYSIS

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I. INTRODUCTION

For many years the Government of Egypt centrally planned and controlled agricultural production, with agricultural input quantities and prices as well as the prices of farm products established by government. In the last two years, however, a gradual relaxation of controls has been introduced. Now farmers have greater freedom in the crops they produce. More crops are traded in the open market. Subsidies on inputs are being removed. The private sector is being given greater but still quite limited opportunity in providing the farmers with their input requirements.

The government is now considering the privatization of the input distribution activities of PBDAC. This entails primarily the transfer from PBDAC to the private sector of the importation, storage, and distribution to farmers of fertilizers, pesticides, seed, large animal feed, agricultural machinery and equipment, and jute bags. In the text of this report a number of options for the privatization of each input activity of PBDAC have been recommended. The objective of this annex to the report is to analyze:

1. The financial implications for farmers' gross margins of the removal of the present direct subsidies, assuming that all other cost factors remain constant, and assuming that there is no change in the prices of the farmers' outputs; and

2. The financial implications for the farmers' gross margins if world prices are applied to both production inputs and outputs.

The methodology used for the above two analyses consists of the formulation of typical farm enterprise budgets representing the prevailing cropping patterns as well as the actual costs of inputs to the farmers and the incomes of farmers from sale of their product, inclusive of all subsidies and government controlled output prices. The farm enterprise budget, referred to as the base case, or Scenario I, establishes the bench mark against which the implications for farmers' gross margins of the removal of subsidies (Scenario II) and the application of world prices (Scenario III) are compared.

Section II of this annex provides detailed information about:

- Farm gate prices for selected relevant crops;
- Agricultural input prices;
- Subsidies applied to agricultural inputs;
- World prices for inputs and outputs; and
- Shadow farm gate prices for inputs and outputs.

Section III discusses the methodology used in calculating the economic impact. Finally, Section IV analyses the impact on the

farmers' gross margins of the removal of the subsidies and the application of world prices.

II. DERIVATION AND ANALYSIS OF BASIC DATA

This chapter describes and as necessary analyzes the principal data elements upon which the economic analyses of the final chapter are based. The data are those for farm gate prices; agricultural input prices; subsidies applied to inputs; world prices for inputs and farm outputs; and shadow farm gate prices.

Farm Gate Prices

Farm gate prices of selected crops for the 1987-8 crop year obtained from MOA and PBDAC sources are presented as Table A of this annex. There were three price structures in effect during the year:

- Quota prices (compulsory delivery) for all the cotton and sugarcane crops and 50% of rice;
- A procurement price or floor price at which PBDAC purchased products on behalf of the government; and
- The farm gate price, which represented the free market.

Farm gate prices increased during the year over previous years in keeping with government policy of liberalizing the agricultural sector as a production incentive.

Input Prices

The following is a summary of agricultural input prices and their derivation. These inputs represent those variables in the crop enterprise budgets which are treated in the analytical part of this study. Tables B, C and D show the input prices of fertilizers and seed which were distributed by PBDAC, and cotton pest control prices.

Fertilizer is sold in Egypt by product (ammonium nitrate, ammonium sulfate, urea, etc.). For crop budget estimation, however, fertilizers are represented by the product nutrient value. Thus, if the product urea contains 46% nitrogen, this means that each 100 kg. of urea contains 46 kg. of nitrogen. It is the nutrient which is important to crop production. In this study, the price of nutrient was derived from product prices and included in the crop budgets as cost per unit of nitrogen, phosphorous, and potash. Both product and nutrient prices are shown in Table C. These unit prices are calculated as a weighted average of the produce mix used during 1987-8.

Fertilizer input prices were calculated at two levels:

- The official retail price, which was subsidized; and
- The black market price, which represented the further distribution of allocated supplies.

The prices used in the enterprise crop budgets and in subsequent analyses represent a combination of the retail prices and the black market prices. Fertilizer usage up to the recommended rates of application per crop was valued at the subsidized unit rate, including:

- L.E. 4.50 per ton for distribution;
- A variable levy per product ton; and
- A 5% discount on 80% of sales to cooperative members.

Additional quantities applied to crops above recommended rates were valued at the black market rate, which was assumed to be twice the official retail price. Unsubsidized prices were derived in the same way as official retail prices but with no discounts.

The shadow farm gate price (SFGP) for fertilizer was estimated for each product from published world prices as of December, 1988. The average nutrient unit cost per kilogram was calculated based on the weighted product mix for each governorate. For further details concerning fertilizers, including application rates and pricing, refer to the fertilizer annex to the report.

Pest control for cotton crops is made up to two elements:

- chemicals; and
- application.

The combination of these are packaged as a service for which the farmer pays a subsidized price of L.E. 18 per feddan. This price usually includes four aerial applications of prescribed chemicals and some additional ground application. Cost to the government for purchase and distribution of the chemicals and associated application was estimated at L.E. 121 per feddan in 1988. However, this cost is based on a mix of preferential exchange rates and market rates for imported chemicals. If the imported purchase price of chemicals is factored to the market rate of foreign exchange and the cost of applications added back in, the resulting cost is estimated to be L.E. 225 per feddan. This figure represents the economic price (SFGP) of pest control. A later section of this annex provides a complete explanation of pesticide and cotton pest control pricing.

Agricultural Subsidies

Total agricultural subsidies have increased from L.E. 144.7 million in 1980-1 to L.E. 261.5 million in 1986-7. During the same

period, agriculture GDP rose from L.E. 3,391.6 to L.E. 9,127 million. In 1986-7 subsidies accounted for 7.2% of total inputs, 2.8% of agricultural GDP, and 2.1% of total agricultural value, as shown in the following table.

Major Economic Indicators of Agricultural Subsidy
Agr. GDP in Current Prices (L.E. Million)

	1985-6	1986-7	1987-8
Value of Ag. Production	10,914	12,747	12,625
Production Inputs a/	3,197	3,619	3,722
Ag. GDP	7,716	9,127	8,903
Total Value of Subsidy b/	298.6	261.5	317 c/
Subsidy as % of Inputs	9.3	7.2	9.4
Subsidy as % of GDP	3.9	2.8	3.9
Subsidy as % of Ag. Value	2.7	2.1	2.7

a/ Exclusive of labor, rent, water and credit.
b/ Total values of four inputs: fertilizer, seeds, chemicals and feeds.
c/ Based on preliminary budgets from GAASF.

Source: Preliminary Report on Impact Subsidization, MOA 19/1/89, and The Second Five Year Plan

The foregoing table refers to the subsidies paid on agricultural inputs manufactured and distributed during 1987-8. These subsidies were paid by the General Authority for Agricultural Stabilization Fund (GAASF), which is responsible for stabilization of agricultural prices. The GAASF paid out domestically subsidies amounting to L.E. 349 million in 1987-8. Subsidies were paid on:

- Manufacture of produced fertilizers;
- Distribution of domestically produced fertilizers;
- Distribution of imported fertilizers;
- Pest control;
- Selected seeds; and
- Hybrid seeds.

Fertilizer Subsidies

In January 1988, Egyptian fertilizer manufacturing plants stopped receiving subsidies and started charging PBDAC full cost plus 8%. GAASF closed out the plants' subsidy account and paid

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off back payments due, which amounted to approximately 30% of the L.E. 107 million total subsidy paid to the plants. Because part of the subsidy paid to manufacturing plants was not for production in 1987-8, the subsidy paid by GAASF for fertilizer manufactured and distributed during 1987-8 should be adjusted to reflect approximately L.E. 32 million in back payments which should not be attributed to fertilizer production and distribution during that year. The subsidy paid for fertilizer production and distribution for 1987-8 should therefore be adjusted from L.E. 349 million to L.E. 317 million, as shown in the following table.

Agricultural Input Subsidies Paid by GAASF
1985-6 - 1987-8
(L.E. 000)

	1985-6	1986-7	1987-8
Fertilizer: Local Production	100,747	108,993	107,100
Fertilizer Distribution	16,903	35,935	104,570
Imported Fertilizer	29,607	23,169	25,816
Cotton Pest Control	84,084	91,273	107,668
Select Seeds	4,150	4,150	4,150
Hybrid Maize	20	20	20
Total	235,311	263,540	349,324 a/

a/ Adjusted to 317,194,000.

Source: M. Mazen and M. Qawi, General Authority for Agricultural Stabilization Fund, Preliminary Account, Feb. 1989.

PBDAC showed a significant increase in subsidy amounts during the year 1987-8 for two reasons:

1. The price of fertilizer, ex factory, increased due to subsidy removal from the manufacturing plants; and

2. PBDAC was not able to pass on its increased purchase costs until later in the year.

It should be mentioned that a different set of figures pertaining to subsidies are being used by MOA. These figures have apparently come from the MOF and indicate amounts paid to the GAASF for reimbursement to PBDAC.

It was not possible to reconcile these figures. The figures

presented below only reflect various estimates by different agencies. The figures used by MOA are:

	1986-7	1987-8
Fertilizer Distributed (Tons)	3,415,000	3,500,000
Total Subsidy (L.E.000)	124,551	182,940
Cotton Pest Control Subsidy (L.E.000)	69,371	70,200

In an attempt to resolve the confusion over conflicting data concerning the 1987-8 subsidy, the GAASF has recently issued a third set of figures representing subsidy amounts paid during this year. These are still somewhat confusing, as they do not include subsidies paid to fertilizer manufacturing plants prior to January, 1988. Table D included in the annex presents these figures for illustrative purposes. It should also be mentioned that PBDAC states that subsidies paid to it by the GAASF for fertilizer distribution amounted to L.E. 126 million.

In analyzing the effects of subsidies, the figures currently being used by MOA which represent preliminary work on the analysis of subsidies for the USAID Benchmark Study No. 3 will be used in this report. It is expected that this work will be completed in April 1989, and a more accurate report will be forthcoming. Until that time, the materials presented here reflect the preliminary position of USAID and MOA.

The tabulations immediately below show the nominal subsidy and the real subsidy during the period 1980 to 1988. In this case MOA has chosen an adjusted wholesale price index to measure real value. However, farm input price indexes and farm product price indexes are also being analyzed, and ultimately one of these indices will be chosen to reflect real subsidy value by MOA for its own purposes.

Quantities of Fertilizers Distributed, Total Subsidy and Subsidy Per Ton. Nominal Value. (Current Price)
1980-1 - 1987-8

Years	Quantities Distributed (Tons)	Total Subsidy (L.E. 000)	Subsidy Per Ton (L.E.)
1980-1	2,954,822	113,647	38.46
1981-2	N/A	192,945	N/A
1982-3	2,546,556	136,406	53.56
1983-4	2,313,900	115,595	49.96
1984-5	2,333,457	111,117	47.62
1985-6	2,559,354	121,874	47.62

1986-7	3,415,000	124,551	36.47
1987-8	3,490,758	182,940	52.41

Quantities of Fertilizers Distributed, Total Subsidy, and Subsidy Per Ton. Real Value

Years	Quantities of Distributed Fertilizers (Ton)	Wholesale Index	Total Subsidy (L.E. 000)	Total Subsidy Per Ton (L.E.)
1980-1	2,954,822	100	113,647	38.46
1981-2	N/A	108	178,158	N/A
1982-3	3,546,556	118	115,209	32.48
1983-4	2,313,900	137	84,314	36.44
1984-5	2,333,457	151	73,539	31.52
1985-6	2,559,354	171	71,271	27.85
1986-7	3,415,000	200	62,089	18.18
1987-8	3,490,758	228	80,236	23.00

The above figures show that in nominal terms the fertilizer subsidy increased over the period 1980-8 from L.E. 38/ton to L.E. 52/ton. However, the increase in the rate of subsidy was slower than inflation, so that over the period fertilizer subsidy dropped in real terms from L.E. 38/ton to L.E. 23/ton (in Egyptian pounds of 1980-1).

Fertilizers are by far the most important input distributed and subsidized. This subject is dealt with in Annex A, which includes a full account of fertilizer procurement, importation, manufacture, distribution, pricing, and subsidy.

Pesticide Subsidies

Pesticides (which include herbicides, insecticides, fungicides, etc.) are the next important input with respect to subsidies. It has been repeatedly stated to the study team that pesticides are not subsidized, that subsidies are applied only to cotton crops, and that the aerial application as a package is subsidized, not the pesticide itself. However, further discussions with cognizant authorities shed a somewhat different light on the matter. Pesticides are indeed subsidized from two perspectives:

- All pesticides are imported, and the majority are

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imported at a preferential rate (L.E. 0.707 = $1.00); and

- Pesticides are subsidized as a component of the aerial and ground application package for cotton pest control.

There are also some minor pest control applications on rice, beans, onions, and palm tree crops, which amount to about L.E. 2 million annually in subsidies. Apparently pesticides used on crops other than cotton, and to a minor degree on the other crops mentioned above, are not subsidized either by preferential exchange rate or in distribution. In addition, information to date from MOA/AES, PBDAC, and MOA's Central Administration for Plant Protection suggests that pesticides used on cotton pest control account for 85% of all pesticides imported by MOA.

The inference is that relatively little pesticide is used on most crops other than cotton. This is borne out when average cost of production budgets prepared by MOA are analyzed. However, this is in contradiction with the recommended crop packages prepared annually by MOA, which indicate that anywhere from L.E. 10 to L.E. 90 of pesticides are to be used per feddan. Indeed, pesticide requirements as indicated by the annual cropping plan issued by MOA amount to approximately $234 million. In reality, due to foreign exchange restrictions, approximately $100,000,000 in pesticides were imported in 1987-8. Of this amount the share of MOA was $86.5 million (pesticide worth $78,000,000 imported at the preferential exchange rate cost MOA L.E. 55,000,000, and $8,695,652 imported at the market rate cost MOA L.E. 20,000,000). Approximately 85% of the total MOA pesticide was used on cotton. This amounted to $73.5 million (L.E. 63,750,000 at the combined exchange rates). About 10%, or $2.5 million, was used on rice, beans, onions, and palm tree crops. The balance, or about $11.5 million, was applied to all other crops. The private sector imported about $15,000,000 in pesticides in 1987-8 which, if added to the MOA figures, implies that about $3.10 per feddan in pesticides was applied to all crops other than cotton and to some extent rice, beans, onions, and palm trees. The bulk of this amount is probably applied to vegetables and specialty crops. The fact is that other than for cotton, very little pesticide is used in the cropping system.

Cotton utilizes 72.25% of the pesticides budget, and this input is highly subsidized. The farmer pays L.E. 18 per feddan for cotton pest control, which includes a package of aerial and ground application. Figures from the Central Administration for Plant Protection of MOA show that the financial cost of cotton pest control in 1987-8 was L.E. 121 per feddan (the import cost of pesticide per feddan equated to L.E. 62.87; duties, commissions, blending, distribution, and application apparently added another L.E. 58.13 per feddan to the import cost). Thus the farmer was subsidized L.E. 103 per feddan.

There were 1,014,000 feddans in cotton production in 1987-8. The total cost for providing cotton pest protection was therefore L.E. 122.7 million. Payment amounted to L.E. 18.3 million, leaving a subsidy of L.E. 104.4 million.

One of the GAASF subsidy budgets for 1987 supports this figure. MOA, however, is using another subsidy figure for their analysis on subsidies; this shows approximately L.E. 70 million in subsidies paid in 1987-8. This figure also comes from GAASF for the same period. The following table illustrates subsidies using the L.E. 70 million figure.

Financial Subsidies on Cotton Pest Control, Nominal and Real Values, Total and Per Feddan 1980-1 to 1987-8

Year	Area (000 Fd)	Nominal Subsidy (L.E.000)	Real Subsidy (L.E.000)	Subsidy Per Fd. Nominal (L.E.)	Subsidy Per Fd. Real b/ (L.E.)
1980-1	1,245	46,000	46,000	37	37
1981-2	1,178	48,400	44,815	41	38
1982-3	1,066	68,929	58,414	65	54.88
1983-4	998	69,730	50,898	70	51
1984-5	984	66,548	44,072	68	44.79
1985-6	1,081	68,200	39,883	63	36.89
1986-7	1,055	69,371	34,686	66	32.88
1987-8	1,014 a/	70,200	30,789	69	30.36

a/ Final figure for cotton crop area 1987-8, MOA.
b/ In L.E. of 1980-1.

The above figures refer to the financial costs of pesticides, as seen both by the farmer (L.E. 18/fd) and through the domestic distribution of cotton pest control (L.E. 121/fd). Another cost is implied by the preferential exchange rate at which approximately 77.5% of MOA pesticide is procured. The following table shows the cost and economic price of cotton pest control for 1987 to 1989, taking the preferential exchange rate subsidy into account.

Cost of Pest Control Application on Cotton
and Economic Price, 1987 to 1989 (L.E./fd)

Year	1987	1988		1989	
Farm Price	18	28		45	
Economic Subsidy	251	268	a/	266	b/
Economic Price	269	296		311	

a/ 1988, preliminary
b/ 1989, estimated

The economic price figure used by USAID for a feddan of cotton pest control was L.E. 269/fd during the 1987-8 crop year. A policy change was inaugurated mid-way through the year to raise the pest control price to L.E. 28/fd, but it is not known if this increase has been implemented.

The above analysis measures the pest control package but does not address the components. If pesticide is removed from the package and analyzed separately as representing the imported component of the package and thus most representative of an economic cost element, the following is observed:

Financial Subsidies on Cotton Pesticide
and Applications (L.E.)

Total cost of cotton pest control		122,694,400
Total cost of chemicals to MOA	a/	77,793,493
Cost of chemicals for cotton (85%)		63,750,000
1,014,000 feddans of cotton 1987-8		62.87/fd
Chemicals and application cost estimate/fd.	b/	121/fd
Breakdown of components:		
Chemicals		87/fd
Applications (aerial and ground	b/	34/fd
Add-on costs for chemicals (L.E. 87-L.E. 62.87)		24.13/fd
Payment by farmer		18/fd
Total paid by farmers		18,252,000
Subsidy amount	c/	104,442,000
Subsidy/fd		103/fd

a/ Source: PBDAC
b/ Source: MOA/AES, Central Administration for Plant Protection.
c/ The figure supplied by GAASF for cotton pest control subsidy was L.E. 107,667,770, which compares favorably with this figure.

Economic Subsidies on Cotton Pesticides & Applications

1. Total Importation of chemicals	$100,000,000
2. MOA Imports	$86,489,145
3. Conversion to equivalent $	
L.E. 55,000,000 at 0.707 a/	($77,793,493)
L.E. 20,000,000 at 2.30	($8,695,652)
4. Cost of cotton pesticide, L.E.	LE 63,750,000
5. Cost per feddan (1,014,000 fd in cotton)	LE 62.87/fd
6. Assuming the same pro rata for cotton chemicals as in the MOA budget, the LE 63,750,000 converted to economic rates are:	
LE 46,749,997 @ preferred rate x 3.25 factor	151,937,490
LE 17,000,000 @ market rate	17,000,000
Total economic expenditure	168,937,000
7. Estimated cost of cotton pest control a/	122,694,400
8. Components of cotton pest control cost	
chemicals: LE 87/fd	
application: LE 34/fd	
9. Cost of chemicals (87 x 1,014,000 fd)	88,218,000
10. Cost of procurement	63,750,000
11. Add-ons to procurement of chemicals (9 - 10)	24,468,000
12. Total economic cost of chemicals (6 + 11)	193,405,000
13. Farmer pays LE 12/fd for chemicals b/	12,168,000
14. Net economic cost of chemicals (12 - 13)	181,237,000
15. Cost of application	34,476,000
16. Farmer pays LE 6/fd b/	6,084,000
17. Net cost of application (15 - 16)	28,397,000
18. Total economic cost (12 + 15)	227,881,000
19. Net economic cost of subsidy (18 - 13 - 16)	209,629,000

a/ Figures supplied by the Central Administration for Plant Protection, by Dr. Yassin Osman.
b/ MOA cost of production budgets 1986-7.

The analyses in the two preceding tables are interpretations of the figures supplied by the GAASF and the Central Administration

for Plant Protection. Since they seem to balance out in a more accurate fashion than any other analyses seen to date, they are used in this report as reflecting financial, border, and economic (SFGP) prices for pesticides and pest control applications. It should also be noted that the GAASF figures for cotton pest control show a subsidy of L.E. 68 million. If this figure represents the chemical portion of the pest control package, it compares favorably with the financial net cost of chemicals derived above less the farmers' payments, estimated at around L.E. 75 million.

Seeds

Seeds are also subsidized through the input distribution channels; seed subsidies are summarized in the following table.

GOE Subsidies Applied to Total Cost of PBDAC-Distributed Field Crop Seeds, 1988

Crop	Rate of Subsidy (L.E./MT)	Seeds Distributed (Tons)	Subsidy (L.E.)
Wheat	51.56	53,005	2,732,938
Onion Bulbs	58.46	510	29,815
Local Beans	88.75	9,469	840,374
Lentils	21.29	828	17,628

Soya beans are also subsidized but the subsidy is not applied to PBDAC. The following table provides further details about subsidized seeds and the subsidy component

Suggested Retail Price of Seeds, Subsidy Amounts, and Unsubsidized Prices, 1987-8 (L.E./Kg)

Seed	Price	Subsidy	Unsubsidized Price
Wheat	.307	.0516	.3586
Local Beans	.613	.021	.634
Lentils	.90	.089	.989
Soya Beans	.585	.027	.612

Source: PBDAC, Mr. Kamal El Laben

World Prices for Inputs and Outputs

World prices are presented in this section in order to establish the basis for the economic values of inputs and commodities. They also serve as a general comparison of domestic farm gate prices to the pricing structure of the world market.

World Prices for Selected Commodities
(FOB Alexandria)

Commodity	1984-5	1985-6	1986-7	1987-8
Lint Cotton ELS (US$/Ton)	132.1	143.4	175.1	212.3
Cottonseed Meal (LE/Ton)	164	116	138	165
Rice (US$/Ton)	262	227	220	240
Corn (US$/Ton Fob. US)	137.3	113.2	90.3	116
Wheat (US$/Ton)	163.71	151.99	139.9	129.9
Raw Sugar (US$/Ton)	139	114	158	178

Input Prices

In developing the farm budgets and subsequent analyses it was necessary to determine the world prices of imported agricultural production inputs, particularly those that would be affected in privatization scenarios. The predominating inputs were vegetable seeds, pesticides, and fertilizers. Since vegetable seeds are handled by the private sector, they were not included in the analyses. However, pesticides play a major role in the agriculture sector and are all imported. MOA has supplied a list of all pesticides used in Egypt and the applicable price schedule. Since about 85% of the MOA-budgeted pesticides are used on cotton, it was decided to estimate the world price per feddan of these pesticides as follows:

Pesticides

GOE Budget for pesticide imports (87-8)	$100,000,000
86.5% goes to MOA	$ 86,500,000
85% of 86.5% goes to cotton	$ 73,500,000
Feddans in cotton	$ 1,014,000
Border price/fd	$ 72.48

Fertilizer prices are set forth below.

Product	World Price ($/Ton C&F Alexandria)		$/Ton
Calcium Nitrate	49.00		61.07
Calcium Ammonium Nitrate	110.00		122.15
Ammonium Nitrate	120.15		132.00
UREA	135.00		147.00
Ammonium Sulphate	70.00		82.00
Single Super Phosphate	79.40	a/	91.40
Triple Super Phosphate	179.40		191.40
Potassium Sulfate	245.00		257.00
Double Super Phosphate	151.12	a/	163.12

a/ pro-rated from TSP prices

Shadow Farm Gate Prices

From a farmer's viewpoint, the subsidized cost of an input represents his real cost. However, from society's view this is a financial accounting cost. In order to determine the economic cost, these costs are compared with prices at which these commodities are traded internationally. The rationale behind this is to measure the efficiency of resource utilization. In other words, what is the opportunity cost of domestic production as compared to purchasing or selling that same commodity on the world market?

Shadow farm gate prices are international prices of commodities or inputs at the border, adjusted by a series of costs associated with bringing the goods to the farm.

Crop Prices

The shadow farm gate prices (SFGP) for cotton, rice, and sugar cane used in the model were taken from a recent preliminary study undertaken by USAID in conjunction with MOA for Benchmark No. 6 of Tranche 3. These figures many change before the final report, but are used here to attempt to conform with some of the ongoing USAID-sponsored work.

SFGPs for wheat, maize, and sorghum were derived from world prices taken from the 1988 FAS publication (pp 30 and 31) and from The World Bank News, Vol. III, No. 4, January, 1989. The price used for corn and sorghum were an average of the prices extending through the Egyptian crop year (Oct.-Sept.) For wheat, the price of Jan. 1988 was taken as indicative of an average price. The shadow exchange rate used was L.E. 2.30 = $1.00.

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Tables E through K illustrate the methodology used to derive the SFGPs. A summary of those tables follows:

Crop	SFGP (L.E./ton)
Cotton ELS	3,277.84 a/
Rice	206.00
Maize	377.30
Sugar Cane	45.00
Wheat	407.20
Sorghum	255.98

a/ Value of joint products

Fertilizer Prices

Table K shows the derivation of the SFGPs for fertilizers, which are summarized as follows:

Product	SFGP (L.E./ton)	Nutrient	(L.E./kg.)
CN	169.82	N	0.925
AS	219.34	P205	1.55
CAN	314.32	K20	1.33
AN	337.62		
UREA	373.38		
SSP	241.31		
DSP	411.11		
TSP	477.99		
PS	632.77		

Pesticide Prices

The world price of pesticides was taken as the total procurement price of pesticides used on cotton pest control on a per feddan basis. The assumed distribution, commission, and levies were added to arrive at a SFGP. Details were provided earlier in this chapter. Since cotton pest control is a package of applications including aerial and ground application, the cost of

application must be added to the economic price or SFGP of chemicals to arrive at a total price for the package.

Chemical Procurement Cost	:	L.E. 168,937,000
Add-ons	:	L.E. 24,468,000
SFGP of Chemicals	:	L.E. 193,405,000
Cost of Application	:	L.E. 34,476,000
SFGP Cotton Pest Control	:	L.E. 227,881,000
SFGP per feddan	:	L.E. 224.73

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III. THE ECONOMIC MODEL

This section of the report presents the crop budgets and subsequent analyses of options as presented by PBDAC study team to date.

Conventions and Methodology

In order to prepare the crop enterprise budgets and to undertake ensuing analyses, a number of conventions and assumptions were adopted. Some of the assumptions have been presented in the preceding text; the rest will be presented here. Finally, a detailed description of the methodology is included.

Since the study concerns the privatization of PBDAC input distribution activities in a current time frame and the request was to measure any subsequent impacts at the farm level, an attempt was made to arrive at current crop budgets. Unfortunately this was not possible for the current year. The most current MOA cost of production budgets are for 1986-7 and are not yet finalized. These data are not expected to be available for several months and will be included in the Agricultural Statistical Year Book, 1988. Unpublished data were obtained from MOA for 1986-7, but were fragmented and inconsistent. Nevertheless, they served as a basis of reference for subsequent estimates. Crop budget data are hard to obtain outside MOA; however, PBDAC under the USAID-sponsored Agriculture Production and Credit Project (APCP) has developed crop enterprise budget estimates for the year 1988 for the purpose of credit analysis. These crop budgets were used as the basis for the estimated crop enterprise budgets developed in this study, under the assumption that they represent the most current information available and that they are based on acceptable techniques. These PBDAC budgets were developed for 12 governorates in the manner described below.

> "Each governorate has a committee whose members include the Chairman of the BDAC, the Director of Credit of the BDAC, the Undersecretary of Irrigation, and three subject matter specialists. This committee delegates to a subcommittee, usually including the Extension Director, Director of Credit, and members of their staffs, to develop crop packages according to the local conditions, prices, and priorities of the governorate. The budgets are then returned to the Executive Committee within the governorate for approval and signing"[1].

The technical recommendations associated with the budget are prepared by the permanent representative to PBDAC from the

[1] Tom Wetsel, Chemonics AP&CP Project, Memo to USAID, 1989.

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Extension Service, who together with the National Extension Office collects information from technical experts and the Agricultural Research Center. These recommendations, together with prevailing pricing and adjustments for the agronomics of the particular governorate, then constitute the basis for the budget information. In addition to the APCP budgets, the MOA extension service prepares an annual budget for the summer and winter seasons from technical recommendations based on the current national cropping plan. These recommendations contain crop packages which explain cultivation procedures and establish budgets per crop. These, however, are global in aspect and do not take into account the varying agro-ecological conditions or pricing structure per governorate. These technical recommendations are added to the APCP budgets representing a 13th governorate, and are thus incremental in determining the average crop budget.

The actual crop budgets used in this study are based on information supplied by PBDAC/APCP and MOA, from which estimates for the 1987-8 crop season were developed. There were numerous inconsistencies in the PBDAC budgets, which were amended through technical input from PBDAC staff.[2]

The PBDAC budgets, being based on technical requirements to obtain maximum yields, differed in some aspects from MOA cost-of-production budgets for 1986-7. The primary differences were in the amount of inputs to be applied to obtain maximum production, as opposed to what was in reality applied. Farmers apparently do not use inputs at recommended levels. Whether this is due to cash constraints, allocations, reporting errors, or combinations thereof is conjectural. For instance, there is apparently very little pesticide used on crops other than cotton. The GOE budget allocation for expenditure on imported pesticides is far below that suggested for crop requirements, and the MOA cost-of-production budget reflect this. Governorates, for example, showed pesticide applications from zero to a high of L.E. 25.87/feddan for onions. The PBDAC budgets were adjusted to reflect input usage as per the MOA cost of production budgets. No costs for pesticides were included in the study budget, except for cotton pest control and a minor amount for sugar cane. Fertilizer applications were adjusted to lower levels and seeding rates also adjusted accordingly. It should be mentioned, however, that in some instances seeding rates for wheat were excessively high. It was found that this was related to the fact that value of wheat straw

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[2] An expression of gratitude is in order to Dr. Mahmoud Nour, Vice Chairman of PBDAC, for his help and support in reviewing the budgets and adding specific detail where needed. Also, Dr. Ibrahim Siddik, Agricultural Economics Consultant to PBDAC, is to be thanked for his suggestion of governorates to be used and his definition of rotations and suggestions of crops for use in the rotations.

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is almost as high as the grain value to farmers and high seeding rates were used to increased vegetative yield.

The farm gate prices were provided from unpublished data of MOA/AES for the crop year 1987-8. They show the procurement prices for those crops for which PBDAC provides floor prices, a quota price for all the cotton and sugar cane crop and one-half the rice crop, and a market price for all other crops for which information was available.

Yields and areas under production for each crop were also provided by MOA/AES for 1987-8 and were said to be actual, that is finalized. The farm gate prices and yields were average quantities. Thus the enterprise budgets used in this study show some deviation from the MOA/AES data in order to reflect varying yields and prices associated with differing agro-resource conditions and distribution costs in each governorate. Since data showing the quantities of production bought by PBDAC at floor prices compared to that which was sold on the open market were not available, market prices prevailed. This might have biased the revenue upward in the budgets. In the case of rice, a price of L.E. 250 per ton was used as an average between the quota price and suggested market price averages.

The method of calculation of production input variables in Egypt is based on full cost-of-production budgeting. This means that operations were fully costed and input variables such as labor, seeds, fertilizers, and pesticides appear as aggregate sums. No unit costing is done at MOA. It was virtually impossible to disaggregate inputs used and associated prices. Consequently, it was necessary to use crop technical requirements, which are global in nature, and amend them according to governorate variations in order to derive unit costs for fertilizers and seeds.

In order to measure the impact of any recommendations which would alter supply or cost of the three variable inputs examined (fertilizers, seeds, and pesticides), it was decided (following PBDAC's advice) to measure those impacts as close to a real world situation as possible. The rationale was that any privatization scenario should first measure impact on farmer.

In order to approximate the cropping activities of a farmer, "typical" crop rotations were developed following the advice of Dr. Ibrahim Siddik, Agricultural Economics Consultant to PBDAC. Dr. Siddik defined the individual rotations and suggested that separate rotations be established for the Delta, Middle Egypt, and Upper Egypt to provide for regional crop and price variations. Four governorates were chosen: two in the Delta (Menofia and Dakahlia) to show the crop differentiation of this region; one in Middle Egypt (Beni Suef); and Sohag in Upper Egypt. The rotations were based on the MOA cropping plan for a three-year rotation and were developed as follows:

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In order to measure the potential farmer impacts resulting from this study, crop enterprise budgets were developed, as previously described, in which farm prices, input costs, and yields reflecting the 1987-8 crop year were incorporated. This data base was linked to an operational model of a "typical" farm rotation for each governorate using complete spreadsheet software. The rotations, which in essence were exhibits of a three-year sequence, were contracted to a one-year rotational mode in which all crops associated with a proportionality of area within a feddan were reduced by one-third. The reason behind this was to produce an average return per feddan incorporating all crops, from which to examine a point-in-time reaction of the net return from the rotation to changes in inputs pricing. Thus there was no provision for inflation or for changes in yields and in operation costs, with the exception of fertilizer, seeds, and pesticides. In other words, this is a relatively static model, but a model in which immediate order-of-magnitude impacts can be seen and one which was considered to offer the best view from a broad-brush approach to planning. Fine-tuning of the model can be developed in further studies. It should be mentioned here that the lack of details regarding unit prices precluded any attempt to analyze input substitution as a farmer's rational response to rising input cost. All operation costs in the enterprise budgets were kept constant, with the exception of those of the three analyzed inputs. Likewise, all yields were kept constant. Finally, the model was set up to measure the gross margins of crop production; thus no provision was made to include rent, interest, or return to managment.

It must be re-emphasized that the economic analysis is for a specific point in time. All changes in costs and revenues are measured as occurring immediately, not over time. The rationale again is to measure the immediate effect of an action on the farmer, even if the action is planned to take effect over a specified time period.

Crop Budget Analysis

The above information presents the methodology and conventions used in developing the crop enterprise budgets and all pricing structures. The following sections deal with the analyses of these budgets consistent with the findings and recommended options of the PBDAC study team.

Marginal Response Analysis of Fertilizers

As requested in the terms of reference, an analysis was made of the response of certain crops to varying levels of fertilizer applications. In economic terms, the optimum level of fertilizer application is obtained when the last incremental addition of nutrient results in marginal costs equalling marginal benefits.

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Using response curves developed for and presented in the fertilizer annex of this report from information supplied by Drs. Serri and Hamissa, Consultants to MOA, the following marginal yield response tables were prepared.

Cotton (per feddan)

N, Kg/fd	Marginal Yield, Kg/fd	Crop Value, LE/kg	N Cost, LE/kg	Marginal Return, LE	Marginal Cost, LE	Marginal Benefit, LE
0	---	---	---	---	---	---
15	108.55	.95	.33	103.33	4.95	98.38
30	78.99	.95	.33	75.20	4.95	70.25
45	49.44	.95	.33	47.06	4.95	42.11
60	19.88	.95	.33	18.93	4.95	13.98
75	-9.67	.95	.33	-9.21	4.95	-14.16

Rice (per feddan)

N, Kg/fd	Marginal Yield, Kg/fd	Crop Value, LE/kg	N Cost, LE/kg	Marginal Return, LE	Marginal Cost, LE	Marginal Benefit, LE
0						
2	246.68	.25	.33	62.00	6.60	55.00
40	205.64	.25	.33	51.00	6.60	45.00
60	164.60	.25	.33	41.00	6.60	35.00
80	123.56	.25	.33	31.00	6.60	24.00
100	82.52	.25	.33	21.00	6.60	14.00
120	41.48	.25	.33	10.00	6.60	4.00
140	.44	.25	.33	.10	6.60	-6.00

Wheat (per feddan)

N, Kg/fd	Marginal Yield, Kg/fd	Crop Value, LE/kg	N Cost, LE/kg	Marginal Return, LE	Marginal Cost, LE	Marginal Benefit, LE
0						
15	296.19	.27	.33	78.79	4.95	73.84
30	232.82	.27	.33	61.93	4.95	56.98
45	169.45	.27	.33	45.07	4.95	40.12
60	106.08	.27	.33	28.22	4.95	23.27
75	42.71	.27	.33	11.36	4.95	6.41
90	-20.66	.27	.33	-5.50	4.95	-10.45

Maize (per feddan)

N, Kg/fd	Marginal Yield, Kg/fd	Crop Value, LE/kg	N Cost, LE/kg	Marginal Return, LE	Marginal Cost, LE	Marginal Benefit, LE
0						
15	178.21	.32	.33	57.21	4.95	52.26
30	154.83	.32	.33	49.70	4.95	44.75
45	131.55	.32	.33	42.23	4.95	37.27
60	107.96	.32	.33	34.66	4.95	29.71
75	84.68	.32	.33	27.18	4.95	22.23
90	61.30	.32	.33	19.68	4.95	14.73
105	37.92	.32	.33	12.17	4.95	7.22
120	14.54	.32	.33	4.67	4.95	0.28

Source: All tables, Gregory, D.I., 1989, PBDAC Study, Unpulished.

The above tables show the marginal responses of various crops in production, using average market prices for 1987-8. In summation, the optimum rate of fertilizer application is determined when marginal returns equal marginal costs, as shown below.

Cotton optimum application of elemental N: 67.5 Kg. N/fd.
Maize optimum application of elemental N: 118.5 Kg. N/fd.
Rice optimum application of elemental N: 128.0 Kg. N/fd.
Wheat optimum application of elemental N: 80.8 Kg. N/fd.

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IV. IMPACT ANALYSIS

There follows an analysis of the measured impacts to crops in the defined "typical" rotation and the net returns of those rotations resulting from the recommendations and options of the PBDAC study team. The analysis concerns itself with the input distribution of PBDAC and with those inputs analyzed by the study team to date. If no impact was perceived, or if perceived but not quantifiable at this time, it was not included in the analysis as of this writing, but may under further analysis be included at a later date.

Recommendations of Main Report

For complete details on recommendations and options refer to the appropriate sections of the report to which this document is an annex. The present annex analyses the economic impact of the following key recommendations:

1. In order for privatization to take place and sustain itself, GOE policies must be restructured so that all competitors for input distribution operate in the same financial arena. This "level playing field" concept implies removal of subsidies at the importation and distribution levels, and a liberalization of pricing and operational policies which currently restrict economic incentives for the private sector to complete in input distribution with PBDAC.

2. The private sector is allowed to distribute inputs.

The recommendations will be implemented over a period of three to seven years. The analysis assumes, however, that they will take immediate effect and will be measured directly on the farm crop budget. Three scenarios were developed to analyze Recommendation 1, above. These were considered broad enough in scope to cover the financial and economic pricing in effect during the crop period 1987-8 and to bracket any value aspect of privatization from a broad perspective. These scenarios are:

1. Base case, with current crop production of representative rotations.

2. Removal of subsidies on fertilizers, seeds, and cotton pest control.

3. Price adjustment of cotton, rice, wheat, maize, and sorghum along with fertilizers and cotton pest control to shadow farm gate prices.

The first scenario establishes the base case from which to

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measure impacts. The second scenario creates an equitable position for the private sector to compete with the public sector. The third scenario measures the effect if input prices and crops are allowed to approximate world prices adjusted to the farm gate level, so as to visualize the upper limit on possible alternate pricing schedules.

A fourth scenario was developed to measure the estimated effect of privatization of seed distribution. The estimated impact was an increase in the cost of seeds by 30% over current costs. There was no corresponding increase in yield as a result of this recommendation. The prices of seeds were raised 30% except for sugar cane and berseem. Sugar cane falls outside a normal seed-planting mode, and farmers were expected to grow their own berseem seed if prices increased.

A sensitivity test was also run to test what would happen to the net revenue of the rotation if cotton was isolated from any recommendations in scenarios 2, 3, and 4.

In all analyses, the operation costs were assumed to remain constant with varying yields. Cotton pest control represents the main cost related to pesticides that would be impacted by policy liberalization, and the pesticide application on cotton is the only one included in the analyses.

Summary of Findings

Tables L through S of this annex detail the impact of Scenarios 2, 3, and 4 on the base case crop rotations. The substance of these tables is summarized in the following table.

As a sensivity analysis it was determined to allow cotton to remain constant in the rotation, under the assumption that the GOE decided to continue control over the crop. Thus, the gross margin on cotton in Scenarios 2, 3 and 4 was held at the base case level. The scenarios were rerun with all other crops impacted and cotton constant.

The results reflect changes on the initial scenarios, as follows:

Farmers' Gross Margins under Different Scenarios (L.E./fd)

Governorate	Scenario #1 (Base Case)	Changes with Respect to Scenario #1		
		Scenario #2 (a)	Scenario #3 (b)	Scenario #4 (c)
Dakahlyia	459.03	-42.63	+362.02	+360.07
	-	-9.3%	+79.0%	+78.4%
Menufia	500.53	-63.27	+367.87	+362.36
	-	-12.6%	+73.5%	+72.4%
Beni Suef	495.87	-48.41	+300.18	+293.98
	-	-9.8%	+60.5%	+59.3%
Sohag	549.48	-74.50	+74.23	+72.14
	-	-13.6%	+13.5%	+13.1%
	---	---	---	---
Average of 4 governorates	501.23	-57.20	+276.28	+272.14
	-	-11.3%	+56.6%	+55.8%

(a) Scenario #2 - removal of input subsidies, constant crop prices

(b) Scenario #3 - increase of crop prices, fertilizer and cotton pest control prices to shadow farm gate prices

(c) Scenario #4 - similar to scenario #3 with privatization of seeds (30% increase in seed prices)

Farmers' Gross Margins under Different Scenarios,
Without Price/Subsidy Changes for Cotton (LE/fd)

Governorate	Scenario #1 (Base Case)	Changes with Respect to Scenario #1		
		Scenario #2 (a)	Scenario #3 (b)	Scenario #4 (c)
Dakahliya	459.03 -	-19.59 -4.3%	+21.96 +4.8%	+19.68 +4.3%
Menufia	500.53 -	-40.72 -8.1%	-75.68 -15.1%	-80.71 +16.1%
Beni Suef	495.87 -	-28.28 -5.7%	-32.87 -6.6%	-38.72 -7.8%
Sohag (d)	549.48 -	-74.50 -13.6%	+74.23 +13.5%	+72.14 +13.1%
Average of 4 governorates	501.23 -	-40.77 -8.1%	-3.09 -0.6%	-27.61 -5.5%

(a) Scenario #2 - removal of input subsidies, constant crop prices

(b) Scenario #3 - increase of crop prices, fertilizer and cotton pest control prices to shadow farm gate prices

(c) Scenario #4 - similar to scenario #3 with privatization of seeds (30% increase in seed prices)

(d) No cotton in Sohag rotation - same figures as in preceding table.

Conclusions

Effect of Liberalising Prices of all Crops

The first of the preceding two tables, entitled "Farmers' Gross Margins Under Different Scenarios", indicates (Scenario #2) that removing all subsidies on inputs without changing crop prices would cause farmers' gross margins in the four governorates to decline by an average of 11.3%, ranging from a decrease of 9.3% in Dakahliya to 13.6% in Sohag.

Scenario #3 allows the price of fertilizer and cotton pest control, as well as of cotton, wheat, rice, maize, sugar cane and sorghum, to increase to shadow farm gate prices (world market prices less costs of delivery to/from the farm gate). In this scenario, farmers' gross income will increase by an average of 56.6%. Most of this increase is due to liberalizing cotton sales price (the increase in gross margin is 60.5% to 79% in the three cotton-growing governorates and only 13.5% in Sohag, where the rotation does not include cotton).

If, in addition, seed distribution is privatized (Scenario #4), with a subsequent 30% rise in average seed prices, the farmers' gross income will decrease by an average of only 0.8% with respect to Scenario #3, with a range of 0.6% to 1.2%.

Effect of Liberalizing Prices of All Crops Except Cotton

The sensivity analysis, summarized in the preceding table, investigates the effect of holding cotton prices and production subsidies at present levels and allowing liberalization of other crop prices and subsidies.

The table shows that if all subsidies other than on cotton are removed, keeping crop prices constant (Scenario #2), the drop in farmers' gross margin will average 8.1%, ranging from 4.3% in Dakahliya to 13.6% in Sohag.

Scenario #3 shows that if fertilizer subsidies are removed and crop prices brought up to shadow farm gate prices for all crops except cotton, the average effect on farmers' gross margin in the four governorates will be only -0.6%, ranging from an increase of 13.5% in Sohag to a decrease of 15.1% in Menufia. In other words, the average effect on farmers' income will be insignificant.

If, in addition to the changes under Scenario #3, seed distribution is privatized, farmers' gross margin will decrease on the average by 5.5% with respect to the present situation. This could be offset by a slight increase in the price of cotton to the farmer.

It is important to remember that the above results represent

a worst-case situation since they are based on a static model which assumes that the areas and levels of inputs for each crop will stay at present levels. But liberalization, by definition, means giving latitude to the farmer to change the crop mix and input levels. The farmer is certain to make adjustments to the present patterns for maximizing his gross returns.

Overall Effect of Liberalization of Farm Inputs

In conclusion, it can be seen that the removal of subsidies will not have a significant negative effect on farmers' gross margins. Even without increases in crop prices, the effect of removing subsidies on the farmer's income will not be large and could be offset by a small increase in the price of cotton to the farmer. Furthermore, with the relaxation of controls on agriculture, farmers are certain to adjust the crop mix and input levels in ways which increase their income, e.g. by cultivating more vegetables and specialty crops. Thus, the total effect of liberalization on farm incomes is likely to be positive, even if cotton prices are not changed for the time being. The magnitude of this positive effect could not, however, be quantified with the data presently available.

Milk and meat production, while not included in this study, is to play a predominant role in the rural economy. Livestock feed and fodder production take up a considerable amount of feddanage in which basic food crops could be grown. The implications of livestock production and the impacts on crop area due to pricing changes on meat and dairy production need to be investigated.

The benefits to the GOE as a result of privatization and policy liberalization will be a direct reduction of subsidy on input distribution, amounting to about L.E. 317 million in 1987-8, and greater revenue to the government through the elimination of the preferential rate of foreign exchange.

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Table A

Farm Gate Prices for Main Crops
and By-Products (L.E./Ton),
1986-7 and 1987-8

Crop	1986-7 Prices Government Procurement	1986-7 Prices Farm Gate	1987-8 Prices Government Procurement	1987-8 Prices Farm Gate
Wheat	200.00	223.46	233.00	267.00
Cotton	727.32	727.32	952.00	----
Rice	200.00	206.00	200.00	300.00
Maize	250.00	254.64	------	312.00
B. Beans	483.87	549.55	484.00	516.00
Lentil	875.00	1000.31	813.00	750.00
Sugar Cane	34.00	34.00	34.00	34.00
Soya Bean	425.00	425.00	500.00	500.00
W. Onion	115.00	142.00	----	115.00
S. Onion	----	130.00	----	----
Berseem	----	200.00		200 per cu
Sorghum	----	336.00	----	300.00
Garlic	----	65.00	65.00	100.00
Sesame	----	1000.00	1000.00	958.00
Tomatoes	----	-----	----	200.00
Wheat Straw	----	106.00	----	110.00
Bean Straw	----	56.00	----	60.00
Lentil Straw	----	70.00	----	71.25
Sesame Straw	----	20.56	----	21.00
Peanut Straw	----	19.20	----	20.00
Corn Stalks	----	26.00	----	25.00
Cotton Stalks	----	23.88	----	25.00
Rice Straw	----	26.40	----	26.40

Source: Agricultural Extension Service, Ministry of Agriculture.

Table B

Retail Prices of Seeds, Subsidy Amounts and Unsubsidized Prices (LE), 1987-8

Seed	Unit	Sale Price	Subsidy	Unsubsidized Price
Wheat	Kg	0.307	0.0516	0.359
Local Beans	Kg	0.613	0.021	0.634
Lentils	Kg	0.9	0.089	0.989
Barley	Kg	0.363	0	0.363
Onion Bulbs	Kg	0.3	0.058	0.358
Black Onions	Kg	10.78	0	10.78
Cotton	Kg	0.08	0	0.08
Rice	Kg	0.218	0	0.218
Sugar Maize	Kg	0.83	0	0.83
White Maize	Kg	0.534	0	0.534
Soybeans	Kg	0.585	0.027	0.612
Sesame	Kg	1.6	0	1.6
Peanuts	Kg	1.24	0	1.24

Source: PBDAC.

Table C

Fertilizer Prices, 1987-8

Product	Subsidized Price L.E. / ton	Market Price a/ L.E. / ton	Unsubsidized Price L.E./ton
CN	57.00	84.00	131.00
AS	74.00	127.00	221.30
CAN	98.00	98.00	262.30
AN	100.00	141.00	275.20
UREA	151.00	203.00	226.75
SSP	42.00	71.00	142.90
DSP	104.00		301.00
TSP	86.00	188.00	321.00
SP	57.00	57.00	211.00

a/ Price paid by farmers, including portion (25%) at black market prices, distribution costs, and levies.

Source: Gregory, D. I., PBDAC Divestiture Study, 1989

Nutrient Prices of Fertilizers
L.E. / Kg. 1987-8

Input	Retail Price	Market Price	Unsubsidized Price	Shadow Farm Gate Price
N	0.331	0.5016	0.6859	0.925
P205	0.2977	0.4439	0.9514	1.55
K20	0.126	0.1892	0.4522	1.33

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Table D

Balance Sheet For Service Organizations
General Organization for the Agricultural Compensation Fund
Current Expenses and Transfers.

Current Transfers	Expected 1987/1988 L.E.	Expected 1988/1989 L.E.	Comparisons 1985/1986 L.E.	Comparisons 1986/1987 L.E.
Rent				
Buildings, Warehouses, Garages	1500	1500	1029	1030
External Interest				
Interest paid to the treasury	----	---	8503	—
Sub. Total	1500	1500	9522	1030
Specialized Current Transfers				
Compensation and Fines				
Agriculture Inputs subsidies				
Principal Bank's duties for pesticide control	107,100,000	108,100,000	100,747,120	108,993,124
Price Stabilization of inportel Fertilizers	24,800,000	25,106,000	13,839,000	4,148,117
Price Stabilization of local fertilizers	39,650,000	158,244,000	7,287,999	11,410,276
Aid to sugarcane irrigation	4,000,000	4,000,000	3,926,569	4,225,000
Sub. Total	185,550,000	295,450,000	125,800,696	128,776,617
Pest Control Obligations				
Govt Contribution in cotton	68,200,000	68,000,000	68,200,000	69,370,545
Contribution in rice grass pest control	1,000,000	------	1,139,477	26,943
Compensation to onion farmers	15,000	15,000	2,916	1,061
Aid to pest control Marsah Matrouh	15,000	15,000	25,000	14,907
Palm trees pest control Asswan	10,000	10,000	10,000	10,000
Palm trees pest control New Valley	30,000	30,000	20,000	29,996
Aid to Fumigate North Sinai	20,000	20,000	10,000	10,000
Govt contribution to onione pest control	300,000	-----	237,826	149,999
Govt contribution to qea beans pest control	1,500,000	-----	649,031	457,012
Sub. Total	71,090,000	68,090,000	70,294,250	70,070,463
Contribution in some Agricultural Advisory Projects and Aprasing Agricultural Production				
Govt Contribution to decrease selected seeds prices	4,150,000	4,150,000	1,430,298	1.335,313
Hybrid corn seeds Burden	20,000	20,000	-----	----
Wheat sugarcane instructional fields expenditures	190,000	190,000	134,892	190,000
Rice Instructional Fields expenditures	100,000	100,000	-----	100,000
Sub. Total	4,460,000	4,460,000	1,565,291	1,625,313
Contribution in Fertilizers Projects				
Subsidizing Agric Gypsum Production	300,000	300,000	300,000	----
Subsidizing Agric Transportations	3,500,000	3,500,000	3,000,559	2,667,383
Subsidizing organic Fertilizers	60,000	60,000	40,000	49,999
Amonia gas Fertilizing Burden	40,000	40,000	39,976	31,406
Sub. Total	3,900,000	3,900,000	3,380,535	2,748,788
	265,000,000	271,900,000	201,040,772	203,221,181
Will be eliminated upon receipt from Credit balance and the production of expenses.	265,000,000	271,900,000	201,040,772	203,221,181

TABLE E

Shadow Farm Gate Price (SFGP), Cotton

	Unit	1987-8
World Price, Lint Cotton, Alexandria	U.S./m.k. a/	$212.30
L.E. Equivalent	L.E.	488.29
Transportation costs, Gin to Alexandria	L.E.	0.60
World Price at Gin		487.69
Lint yld. Kg/m.k. seed cotton a/		0.50
Other Joint Products		
Domestic Price of Scarto	L.E./m.k.	200.00
Scarto yld. kg/m.k. seed cotton		0.02
World Price, Cottonseed		353.04
Yld Kg./m.k. seed cotton		105.00
Value All Products	L.E./m.k.	3,382.60
Seed Processing	L.E./m.k.	92.06
World Price, Seed Cotton at Gin	L.E./m.k.	3,290.53
Transportation Costs	L.E./m.k.	12.70
SFGP	L.E./M.K.	3,277.84
Procurement Price	L.E./m.k.	952.00

a/ Lint yield in Kg. per metric kentar (M.K.) (157.5 kg. unginned).

Source: USAID, MOA/AES. Tranche 3. Benchmark No. 6, Work in Progress Report, March, 1989.

TABLE F

Shadow Farm Gate Price (SFGP) Cottonseed

	Unit	1987-8
World Price CSM a/	$	$145.00
Alexandria	L.E.	LE 379.50
Transportation Costs	L.E.	(15.00)
World price, at Processor	L.E.	379.50
World price, Rotterdam	L.E.	479.00
Transportation Costs	L.E.	20.00
World Price, GSO b/		
Alexandria	L.E.	1,189.10
Transportation Costs	L.E.	10.00
World Price GSO	L.E.	1,179.10
Gross Value	L.E.	364.04
Crush Value	L.E.	6.00
World Price, Cottonseed	L.E.	358.04
Transportation Costs	L.E.	5.00
World Price at Gin	L.E.	353.04

a/ CSM = Cottonseed meal.
b/ CSO = Cottonseed oil.

Source: USAID, MOA/AES Tranche 3, Benchmark No. 6 Work in Progress Report. March, 1989.

Table G

Shadow Farm Gate Price (SFGP) Sugarcane

	Unit	1987-88
World Price Raw Sugar	US$/ton	$148.00
Transportation Costs		30.00
Caribbean to Alexandria	US$/ton	
World Price Alexandria	US$/ton	$178.00
World Price, L.E. Equivalen	L.E.	409.40
Transportation Costs	L.E./ton	9.84
World Price at Factory	L.E./ton	399.56
Raw Sugar Yld/ton sugar cane		0.11
Other Joint Products		
Molasses Yld/ton sugarcane		0.03
World price molasses, L.E./ton		131.43
Bagass yld/ton sugr cane		0.26
World price Bagass	L.E./ton	5.00
Joint Value	L.E./ton	449.01
Processing Margin	L.E./ton	26.30
Net Value Sugar cane	L.E./ton	48.20
Transportation Costs	L.E./ton	3.20
SFGP	L.E./ton	45.00
Domestic Farm Gate Price		34.00

Source: USAID, MOA/AES Tranche 3, Benchmark No. 6, Work in Progress Report, March, 1985.

Table H

Shadow Farm Gate Price (SFGP), Rice

	Unit	1987-88
World Price, Bangkok	US$/ton	$230.00
Transportation Costs	US$/ton	$35.00
World Price, Alexandria	US$/ton	$ 240.00
World Price Alexandria, L.E.	L.E/ton	552.00
Transportation Costs	L.E./ton	7.30
World Price at Mill	L.E./ton	544.70
Domestic Price of Husk	L.E./ton	10.16
Husk yld/ton Unmilled Rice		0.33
Milling Margins		64.58
Value, Unmilled Rice	L.E./ton	303.72
Transportation Costs	L.E./ton	0.30
World Price, Unmilled Rice	L.E./ton	303.42

Source: USAID, MOA/AES Tranche 3, Benchmark No.6
Work in Progress Report, March, 1989.

Table I

Shadow Farm Gate Prices (SFGP), Maize

	1987-88
F.O.B. Gulf Ports	$116.00
Freight & Insurance	$ 30.00
C.I.F. Alexandria	$146.00
L.E. Equivalent	L.E. 335.80
Port to Store Transport	L.E. 23.5
Value in Store	L.E. 359.3
Transport & Distribution to Point of Sale	L.E. 18
SFGP	L.E. 377.3
Domestic Farm Gate Price	L.E. 321

Source: FAS World Report 1988
World Bank News 1, January 1989

Table J

Shadow Farm gate Price (SFGP), of Sorghum

	1987-88
F.O.B. Gulf Ports	$ 82.00
Freight & Insurance	$ 11.25
C.I.F. Alex	$ 93.25
L.E. Equivalent	L.E. 214.48
Port to Store	L.E. 23.5
Value at Whole sale Market	L.E. 237.98
Transportation and Distribution to first market	L.E. 18.00
SFGP	L.E. 255.98

Source: FAS world Report 1988;
World Bank News,26 January 1989.

Table K

Shadow Farm Gate Price (SFGP), Fertilizers

1987-88

Product	C&F Alex.	L.E.	Insurance	Levies	Distribution	SFGP
CN	$ 61.07	140.61	3.51	0.50	25.35	169.97
AS	$ 82.00	188.60	4.72	0.68	25.35	219.35
CAN	$ 122.15	280.95	7.02	1.00	25.35	314.32
AN	$ 132.00	303.60	6.98	1.00	25.35	336.93
UREA	$ 147.00	338.10	8.45	1.48	25.35	373.38
SSP	$ 91.40	210.22	5.26	0.48	25.35	241.31
DSP	$ 163.12	375.18	9.38	1.21	25.35	411.12
TSP	$ 191.40	440.22	11.00	1.42	25.35	477.99
PS	$ 257.00	591.10	14.78	1.55	25.35	632.78

Source: D.I. Gregory, PBDAC Divestiture Study. Unpublished.1989.

Table L

Base Case Scenario Crop Budgets: Dakahlia Governorate

Crop	Gross Revenue	Production cost (L.E. per Feddan)	Gross Margin
Cotton	952.96	531.62	421.34
Rice	707.51	382.33	325.18
Maize	776.50	269.25	507.25
Sorghum	.00	.00	.00
Sugarcane	.00	.00	.00
Short Berseem	400.00	178.28	221.72
Long Berseem	957.00	196.53	760.47
Wheat	807.40	305.90	501.50
Beans	631.80	339.11	292.69
Tomatoes	.00	.00	.00

Table M

Summary Of Scenario Effects On Crop Budgets : Dakahlia Governorate

Gross Margins Per Feddan (LE per Feddan)

Crop	SCENARIOS 1	2	3	4	Net Benefit 2-1	Net Benefit 3-1	Net Benefit 4-1
Cotton	421.34	285.84	2426.41	2423.60	-135.49	2005.07	2002.26
Rice	325.18	295.47	432.49	428.59	-29.71	107.31	103.41
Maize	507.25	471.82	568.51	566.11	-35.43	61.26	58.86
Sorghum	.00	.00	.00	.00	.00	.00	.00
Sugarcane	.00	.00	.00	.00	.00	.00	.00
Short Berseem	221.72	209.42	196.18	196.18	-12.30	-25.54	-25.54
Long Berseem	760.47	748.17	734.93	734.93	-12.30	-25.54	-25.54
Wheat	501.50	462.47	785.50	777.10	-39.03	283.99	275.60
Beans	292.69	252.43	197.36	183.48	-40.26	-95.32	-109.21
Tomatoes	.00	.00	.00	.00	.00	.00	.00
Total Rotation/fd.	459.03	416.04	821.85	819.10	-42.63	362.82	360.07
Total Rotation/fd. Excluding Cotton Decontrol	459.03	439.44	480.99	478.71	-19.59	21.96	19.68

Table N

Base Case Scenario Crop Budgets: Menufia Governorate

Crop	Gross Revenue	Production cost (L.E. per feddan)	Gross Margin
Cotton	1123.62	521.00	602.62
Rice	.00	.00	.00
Maize	820.40	345.70	474.70
Sorghum	.00	.00	.00
Sugarcane	.00	.00	.00
Short Berseem	400.00	213.12	186.88
Long Berseem	952.00	340.26	611.74
Wheat	986.86	327.49	659.37
Beans	889.80	353.48	536.32
Tomatoes	1575.00	709.09	865.91

Table O

Summary Of Scenario Effects On Crop Budgets : Monufia Governorate

Gross Margins Per Feddan (LE per Feddan)

Crop	SCENARIOS 1	2	3	4	Net Benefit 2-1	Net Benefit 3-1	Net Benefit 4-1
Cotton	602.62	469.98	3211.73	3208.93	-132.64	2609.12	2606.31
Rice	.00	.00	.00	.00	.00	.00	.00
Maize	474.7	434.97	526.29	522.69	-39.72	51.60	48.00
Sorghum	.00	.00	.00	.00	.00	.00	.00
Sugarcane	.00	.00	.00	.00	.00	.00	.00
Short Berseem	186.88	150.06	50.06	50.06	-36.82	-136.82	-136.82
Long Berseem	611.74	566.25	429.56	429.56	-45.49	-182.18	-182.18
Wheat	659.37	619.67	954.77	946.70	-39.70	295.40	287.33
Beans	536.32	483.67	375.75	361.01	-52.64	-160.56	-175.30
Tomatoes	865.91	710.03	357.92	335.42	-155.88	-507.99	-530.49
Total Rotation/fd.	500.53	437.26	868.40	862.89	-63.27	367.87	362.36
Total Rotation/fd. Excluding Cotton Decontrol	500.53	459.81	424.85	419.82	-40.72	-75.68	-80.71

Table P

Base Case Scenario Crop Budgets: Beni Suef Governorate

Crop	Gross Revenue	Production Cost (LE per feddan)	Gross Margin
Cotton	924.40	472.79	451.61
Rice	.00	.00	.00
Maize	828.92	335.60	493.32
Sorghum	.00	.00	.00
Sugarcane	.00	.00	.00
Short Berseem	400.00	170.68	229.32
Long Berseem	800.00	246.14	553.86
Wheat	824.70	376.07	448.63
Beans	889.80	352.59	537.21
Tomatoes	2100.00	695.10	1404.90

Table Q

Summary Of Scenario Effects On Crop Budgets : Beni Suef Governorate

Gross Margins Per Feddan (LE per Feddan)

Crop	SCENARIOS 1	2	3	4	Net Benefit 2-1	Net Benefit 3-1	Net Benefit 4-1
Cotton	456.61	333.20	2410.73	2408.63	-118.41	1959.13	1957.03
Rice	.00	.00	.00	.00	.00	.00	.00
Maize	493.32	459.41	561.77	558.17	-33.91	68.45	64.85
Sorghum	.00	.00	.00	.00	.00	.00	.00
Sugarcane	.00	.00	.00	.00	.00	.00	.00
Short Berseem	229.32	222.02	203.42	203.42	-7.30	-25.90	-25.90
Long Berseem	553.86	541.96	504.70	504.70	-11.90	-49.16	-49.16
Wheat	448.63	415.17	657.20	648.82	-33.46	208.57	200.19
Beans	537.21	483.12	368.01	353.17	-54.09	-169.20	-184.04
Tomatoes	1404.90	1336.19	1154.22	1131.72	-68.71	-250.68	-273.18
Total Rotation/fd.	495.87	447.46	796.05	789.85	-48.41	300.18	293.98
Total Rotation/fd. Excluding Cotton Decontrol	495.87	467.59	463.00	457.16	-28.28	-32.87	-38.72

Table R

Base Case Scenario Crop Budgets: Sohag Governorate

Crop	Gross Revenue	Production Cost (LE per feddan)	Gross Margin
Cotton	.00	.00	.00
Rice	.00	.00	.00
Maize	678.25	299.95	378.30
Sorghum	560.00	236.62	323.38
Sugarcane	1576.00	874.41	701.59
Short Berseem	.00	.00	.00
Long Berseem	800.00	273.26	526.74
Wheat	733.26	372.20	361.06
Beans	.00	.00	.00
Tomatoes	.00	.00	.00

Table S

Summary Of Scenario Effects On Crop Budgets : Sohag Governorate

Gross Margins Per Feddan (LE per Feddan)

Crop	SCENARIOS 1	2	3	4	Net Benefit 2-1	Net Benefit 3-1	Net Benefit 4-1
Cotton	.00	.00	.00	.00	.00	.00	.00
Rice	.00	.00	.00	.00	.00	.00	.00
Maize	378.30	344.55	433.64	430.04	-33.75	55.34	51.74
Sorghum	323.38	288.80	172.22	169.88	-34.58	-151.16	-153.50
Sugarcane	701.59	582.70	833.75	833.75	-118.88	132.16	132.16
Short Berseem	.00	.00	.00	.00	.00	.00	.00
Long Berseem	526.74	509.91	455.42	455.42	-16.83	-71.32	-71.32
Wheat	361.06	325.71	593.38	582.64	-35.35	232.32	221.58
Beans	.00	.00	.00	.00	.00	.00	.00
Tomatoes	.00	.00	.00	.00	.00	.00	.00
Total Rotation/fd.	549.48	474.97	623.71	621.62	-74.50	74.23	72.14
Total Rotation/fd. Excluding Cotton Decontrol	549.48	474.97	623.71	621.62	-74.50	74.23	72.14

Table T

Crop Budget Details: Base Case

Beni Suef Governorate

COTTON	Production Months		8
REVENUE			
Projected Gross Income	Units	Price	Total
Bolls Tonnes	.95	952.00	904.40
Stalks tonnes	1.25	16.00	20.00
Total Revenue			924.40
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	7.00	7.00
N	62.00	.33	20.25
P2O5	.00	.30	.00
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	37.70	.62	23.54
P2O5 (Free Market)	.00	.53	.00
K2O (Free Market)	.00	.23	.00
Manure	1.00	22.00	22.00
Agrochemicals	1.00	18.00	18.00
Material Subtotal			102.79
Operations	Unit	Cost	Total
Land Preparation	1	45.00	45.00
Planting	1	20.00	20.00
Replanting	1	3.00	3.00
Transplanting	1	.00	.00
Fertilizing	1	7.00	7.00
Chem. Application- Mech	1	10.00	10.00
Chem. Application- Labour	1	3.00	3.00
Weeding	1	5.00	5.00
Thinning	1	7.00	7.00
Cultivation	1	32.00	32.00
Irrigation	1	76.00	76.00
Harvesting & Cutting	1	120.00	120.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	20.00	20.00
Labor/Machinery Subtotal			370.00
Total "Field Production Costs"			472.79
GROSS MARGIN PER FEDDAN			451.61

Table T

Crop Budget Details: Base Case

(Beni Suef continued)

WHEAT	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.10	267.00	560.70
Straw tonnes	2.40	110.00	264.00
Total Revenue			824.70
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	24.00	24.00
N	70.00	.33	22.86
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	64.20	.62	40.07
P2O5 (Free Market)	8.30	.53	4.44
K2O (Free Market)	.00	.23	.00
Manure	1.00	14.00	14.00
Agrochemicals	1.00	11.20	11.20
Material Subtotal			121.07
Operations	Unit	Cost	Total
Land Preparation	1	38.00	38.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	4.50	4.50
Weeding	1	9.00	9.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	50.00	50.00
Harvesting & Cutting	1	60.00	60.00
Threshing & Winrowing	1	50.00	50.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			255.00
Total "Field Production Costs"			376.07
GROSS MARGIN PER FEDDAN			448.63

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Table T

Crop Budget Details: Base Case

(Beni Suef continued)

MAIZE	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.52	321.00	808.92
Stalks tonnes	1.25	16.00	20.00
Total Revenue			828.92
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	12.00	12.00
N	93.00	.33	30.37
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	14.00	.62	8.74
P2O5 (Free Market)	.00	.53	.00
K2O (Free Market)	.00	.23	.00
Manure	1.00	33.00	33.00
Agrochemicals	1.00	.00	.00
Material Subtotal			100.60
Operations	Unit	Cost	Total
Soil preparation	1	41.00	41.00
Planting	1	25.00	25.00
Replanting	1	6.00	6.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	6.00	6.00
Cultivation	1	36.00	36.00
Irrigation	1	56.00	56.00
Harvesting & Cutting	1	9.00	9.00
Threshing & Winrowing	1	30.00	30.00
Transportation & Packing	1	17.00	17.00
Labor/Machinery Subtotal			235.00
Total "Field Production Costs"			335.60
GROSS MARGIN PER FEDDAN			493.32

Table T

Crop Budget Details: Base Case

(Beni Suef continued)

SHORT BERSEEM	Production Months		3
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	1.00	200.00	200.00
Subsequent Cuts	1.00	200.00	200.00
Total Revenue			400.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	30.00	30.00
N	.00	.33	.00
P2O5	13.30	.30	3.97
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	36.36	.62	22.71
P2O5 (Free Market)	.00	.53	.00
K2O (Free Market)	.00	.23	.00
Manure	1.00	.00	.00
Agrochemicals	1.00	1.00	1.00
Material Subtotal			57.68
Operations	Unit	Cost	Total
Soil preparation	1	30.00	30.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	4.50	4.50
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	4.00	4.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	20.00	20.00
Harvesting & Cutting	1	40.00	40.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	10.00	10.00
Labor/Machinery Subtotal			113.00
Total "Field Production Costs"			170.68
GROSS MARGIN PER FEDDAN			229.32

-404'

Table T

Crop Budget Details: Base Case

(Beni Suef continued)

LONG BERSEEM	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	3.00	200.00	600.00
Subsequent Cuts	1.00	200.00	200.00
Total Revenue			800.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	30.00	30.00
N	.00	.33	.00
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	72.70	.62	45.40
P2O5 (Free Market)	11.70	.53	6.25
K2O (Free Market)	.00	.23	.00
Manure	1.00	8.00	8.00
Agrochemicals	1.00	.00	.00
Material Subtotal			94.14
Operations	Unit	Cost	Total
Land Preparation	1	30.00	30.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.50	9.50
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	8.00	8.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	40.00	40.00
Harvesting & Cutting	1	40.00	40.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	20.00	20.00
Labor/Machinery Subtotal			152.00
Total "Field Production Costs"			246.14
GROSS MARGIN PER FEDDAN			553.86

Table T

Crop Budget Details: Base Case

(Beni Suef continued)

BROAD BEANS	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	1.55	516.00	799.80
Stalks tonnes	1.50	60.00	90.00
Total Revenue			889.80
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	48.00	48.00
N	15.50	.33	5.06
P2O5	30.00	.30	8.96
K2O	30.00	.13	3.78
Foliar (l.)	.00	0.00	.00
N (Free Market)	8.74	.62	5.46
P2O5 (Free Market)	23.30	.53	12.45
K2O (Free Market)	54.50	.23	12.37
Manure	1.00	13.00	13.00
Agrochemicals	1.00	1.00	1.00
Material Subtotal			110.09
Operations	Unit	Cost	Total
Land Preparation	1	38.00	38.00
Planting	1	27.00	27.00
Replanting	1	4.50	4.50
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	9.00	9.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	27.00	27.00
Irrigation	1	28.00	28.00
Harvesting & Cutting	1	50.00	50.00
Threshing & Winrowing	1	30.00	30.00
Transportation & Packing	1	20.00	20.00
Labor/Machinery Subtotal			242.50
Total "Field Production Costs"			352.59
GROSS MARGIN PER FEDDAN			537.21

Table T

Crop Budget Details: Base Case

(Beni Suef continued)

TOMATOES	Production Months		7
REVENUE			
Projected Gross Income	Units	Price	Total
Tonnes	10.50	200.00	2100.00
	.00	.00	.00
Total Revenue			2100.00

EXPENDITURES	Units	Price	Total
Material Inputs:			
Transplants (1,000)	25.00	3.00	75.00
N	90.00	.33	29.39
P2O5	.00	.30	.00
K2O	.00	.13	.00
Foliar (l.)	5.00	3.00	15.00
N (Free Market)	176.00	.62	109.91
P2O5 (Free Market)	100.00	.53	53.45
K2O (Free Market)	50.00	.23	11.35
Manure	1.00	20.00	20.00
Agrochemicals	1.00	30.00	30.00
Material Subtotal			344.10

Operations	Unit	Cost	Total
Soil preparation	1	30.00	30.00
Planting	1	18.00	18.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	8.00	8.00
Chem. Application- Mech	1	17.00	17.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	54.00	54.00
Irrigation	1	54.00	54.00
Harvesting & Cutting	1	50.00	50.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	120.00	120.00
Labor/Machinery Subtotal			351.00
Total "Field Production Costs"			695.10
GROSS MARGIN PER FEDDAN			1404.90

Table U

Crop Budget Details: Base Case

Dakahlia Governorate

COTTON	Production Months		8
REVENUE			
Projected Gross Income	Units	Price	Total
Bolls Tonnes	.98	952.00	932.96
Stalks tonnes	1.25	16.00	20.00
Total Revenue			952.96

EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	9.35	9.35
N	62.00	.33	20.54
P2O5	15.00	.29	4.41
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	47.88	.63	30.16
P2O5 (Free Market)	1.20	.53	.64
K2O (Free Market)	.00	.23	.00
Manure	1.00	25.00	25.00
Agrochemicals	1.00	18.00	18.00
Material Subtotal			120.12
Operations	Unit	Cost	Total
Land Preparation	1	40.00	40.00
Planting	1	30.00	30.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	9.00	9.00
Chem. Application- Labour	1	6.00	6.00
Weeding	1	18.00	18.00
Thinning	1	4.50	4.50
Cultivation	1	10.00	10.00
Irrigation	1	70.00	70.00
Harvesting & Cutting	1	185.00	185.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			411.50
Total "Field Production Costs"			531.62
GROSS MARGIN PER FEDDAN			421.34

408

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

WHEAT	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.20	247.00	543.40
Straw tonnes	2.40	110.00	264.00
Total Revenue			807.40
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	24.00	24.00
N	65.45	.33	21.66
P2O5	15.00	.29	4.41
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	.00	.63	.00
P2O5 (Free Market)	10.52	.53	5.61
K2O (Free Market)	.00	.23	.00
Manure	1.00	16.00	16.00
Agrochemicals	1.00	11.20	11.20
Material Subtotal			82.90
Operations	Unit	Cost	Total
Land Preparation	1	40.00	40.00
Planting	1	5.00	5.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	15.00	15.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	50.00	50.00
Harvesting & Cutting	1	48.00	48.00
Threshing & Winrowing	1	45.00	45.00
Transportation & Packing	1	20.00	20.00
Labor/Machinery Subtotal			223.00
Total "Field Production Costs"			305.90
GROSS MARGIN PER FEDDAN			501.50

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

RICE	Production Months		5.00
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.70	244.44	659.99
Straw tonne	1.80	26.40	47.52
Total Revenue			707.51
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	13.00	13.00
N	65.45	.33	21.68
P2O5	12.41	.29	3.65
K2O	.00	.13	.00
Foliar (1.)	.00	3.00	.00
N (Free Market)	.00	.63	.00
P2O5 (Free Market)	.00	.53	.00
K2O (Free Market)	.00	.23	.00
Manure	1.00	20.00	20.00
Agrochemicals	1.00	.00	.00
Material Subtotal			58.33
Operations	Unit	Cost	Total
Land Preparation	1	55.00	55.00
Planting	1	22.00	22.00
Replanting	1	.00	.00
Transplanting	1	40.00	40.00
Fertilizing	1	12.00	12.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	70.00	70.00
Harvesting & Cutting	1	50.00	50.00
Threshing & Winrowing	1	50.00	50.00
Transportation & Packing	1	25.00	25.00
Labor/Machinery Subtotal			324.00
Total "Field Production Costs"			382.33
GROSS MARGIN PER FEDDAN			325.18

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

LONG BERSEEM	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	4.00	200.00	800.00
Subsequent Cuts	1.00	157.00	157.00
Total Revenue			957.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	30.00	30.00
N	.00	.33	.00
P2O5	15.00	.29	4.41
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	.00	.63	.00
P2O5 (Free Market)	9.14	.53	4.87
K2O (Free Market)	.00	.23	.00
Manure	1.00	6.00	6.00
Agrochemicals	1.00	.00	.00
Material Subtotal			45.28
Operations	Unit	Cost	Total
Land Preparation	1	30.00	30.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	6.75	6.75
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	40.00	40.00
Harvesting & Cutting	1	40.00	40.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			151.25
Total "Field Production Costs"			196.53
GROSS MARGIN PER FEDDAN			760.47

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

MAIZE	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.25	321.00	722.25
Stalks tonnes	2.17	25.00	54.25
Total Revenue			776.50
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	8.00	8.00
N	65.45	.33	21.68
P2O5	15.00	.29	4.41
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	.00	.63	.00
P2O5 (Free Market)	11.55	.53	6.16
K2O (Free Market)	.00	.23	.00
Manure	1.00	20.00	20.00
Agrochemicals	1.00	.00	.00
Material Subtotal			72.25
Operations	Unit	Cost	Total
Soil preparation	1	40.00	40.00
Planting	1	12.00	12.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	12.00	12.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	6.00	6.00
Cultivation	1	30.00	30.00
Irrigation	1	70.00	70.00
Harvesting & Cutting	1	14.00	14.00
Threshing & Winrowing	1	3.00	3.00
Transportation & Packing	1	10.00	10.00
Labor/Machinery Subtotal			197.00
Total "Field Production Costs"			269.25
GROSS MARGIN PER FEDDAN			507.25

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

SHORT BERSEEM	Production Months		3
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	1.00	200.00	200.00
Subsequent Cuts	1.00	200.00	200.00
Total Revenue			400.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	30.00	30.00
N	.00	.33	.00
P2O5	15.00	.29	4.41
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	.00	.63	.00
P2O5 (Free Market)	9.14	.53	4.87
K2O (Free Market)	.00	.23	.00
Manure	1.00	6.00	6.00
Agrochemicals	1.00	1.00	1.00
Material Subtotal			46.28
Operations	Unit	Cost	Total
Soil preparation	1	30.00	30.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	3.50	3.50
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	4.00	4.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	30.00	30.00
Harvesting & Cutting	1	30.00	30.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			132.00
Total "Field Production Costs"			178.28
GROSS MARGIN PER FEDDAN			221.72

Table U

Crop Budget Details: Base Case

(Dakahlia continued)

BROAD BEANS	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	1.05	516.00	541.80
Stalks tonnes	1.50	60.00	90.00
Total Revenue			631.80
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	45.00	45.00
N	15.50	.33	5.14
P2O5	30.00	.29	8.82
K2O	23.85	.13	3.01
Foliar (l.)	.00	3.00	.00
N (Free Market)	6.68	.63	4.21
P2O5 (Free Market)	22.41	.53	11.94
K2O (Free Market)	.00	.23	.00
Manure	1.00	12.00	12.00
Agrochemicals	1.00	1.00	1.00
Material Subtotal			91.11
Operations	Unit	Cost	Total
Land Preparation	1	30.00	30.00
Planting	1	28.00	28.00
Replanting	1	4.00	4.00
Transplanting	1	.00	.00
Fertilizing	1	8.00	8.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	7.00	7.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	40.00	40.00
Irrigation	1	40.00	40.00
Harvesting & Cutting	1	35.00	35.00
Threshing & Winrowing	1	36.00	36.00
Transportation & Packing	1	20.00	20.00
Labor/Machinery Subtotal			248.00
Total "Field Production Costs"			339.11
GROSS MARGIN PER FEDDAN			292.69

Table V

Crop Budget Details: Base Case

Menufia Governorate

COTTON	Production Months		8
REVENUE			
Projected Gross Income	Units	Price	Total
Bolls Tonnes	1.22	921.00	1123.62
Stalks tonnes	.00	.00	.00
Total Revenue			1123.62
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	9.35	9.35
N	62.00	.34	20.93
P2O5	15.00	.30	4.46
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	11.50	.64	7.36
P2O5 (Free Market)	1.70	.53	.91
K2O (Free Market)	.00	.23	.00
Manure	1.00	25.00	25.00
Agrochemicals	1.00	18.00	18.00
Material Subtotal			98.00
Operations	Unit	Cost	Total
Land Preparation	1	35.00	35.00
Planting	1	60.00	60.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	10.00	10.00
Chem. Application- Mech	1	15.00	15.00
Chem. Application- Labour	1	18.00	18.00
Weeding	1	.00	.00
Thinning	1	5.00	5.00
Cultivation	1	.00	.00
Irrigation	1	50.00	50.00
Harvesting & Cutting	1	200.00	200.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			423.00
Total "Field Production Costs"			521.00
GROSS MARGIN PER FEDDAN			602.62

Table V

Crop Budget Details: Base Case

(Menufia continued)

WHEAT	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.70	266.00	718.20
Straw tonnes	2.02	133.00	268.66
Total Revenue			986.86
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	23.00	23.00
N	70.00	.34	23.63
P2O5	15.00	.30	4.46
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	47.00	.64	30.06
P2O5 (Free Market)	10.00	.53	5.34
K2O (Free Market)	.00	.23	.00
Manure	1.00	16.00	16.00
Agrochemicals	1.00	11.20	11.20
Material Subtotal			113.69
Operations	Unit	Cost	Total
Land Preparation	1	36.00	36.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	4.30	4.30
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	60.00	60.00
Harvesting & Cutting	1	40.00	40.00
Threshing & Winrowing	1	30.00	30.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			213.80
Total "Field Production Costs"			327.49
GROSS MARGIN PER FEDDAN			659.37

Table V

Crop Budget Details: Base Case

(Menufia continued)

MAIZE	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.40	321.00	770.40
Stalks tonnes	2.00	25.00	50.00
Total Revenue			820.40
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	12.00	12.00
N	93.00	.34	31.37
P2O5	15.00	.30	4.46
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	39.00	.64	24.95
P2O5 (Free Market)	1.70	.53	.91
K2O (Free Market)	.00	.23	.00
Manure	1.00	33.00	33.00
Agrochemicals	1.00	.00	.00
Material Subtotal			118.70
Operations	Unit	Cost	Total
Soil preparation	1	25.00	25.00
Planting	1	35.00	35.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	5.00	5.00
Chem. Application- Mech	1	7.00	7.00
Chem. Application- Labour	1	10.00	10.00
Weeding	1	.00	.00
Thinning	1	5.00	5.00
Cultivation	1	30.00	30.00
Irrigation	1	40.00	40.00
Harvesting & Cutting	1	20.00	20.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	50.00	50.00
Labor/Machinery Subtotal			227.00
Total "Field Production Costs"			345.70
GROSS MARGIN PER FEDDAN			474.70

Table V

Crop Budget Details: Base Case

(Menufia continued)

SHORT BERSEEM	Production Months		3
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	1.00	200.00	200.00
Subsequent Cuts	1.00	200.00	200.00
Total Revenue			400.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	30.00	30.00
N	.00	.34	.00
P2O5	15.00	.30	4.46
K2O	15.00	.13	1.89
Foliar (l.)	.00	3.00	.00
N (Free Market)	29.00	.64	18.55
P2O5 (Free Market)	25.00	.53	13.35
K2O (Free Market)	62.00	.23	14.07
Manure	1.00	.00	.00
Agrochemicals	1.00	.00	.00
Material Subtotal			82.32
Operations	Unit	Cost	Total
Soil preparation	1	22.00	22.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	6.30	6.30
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	9.00	9.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	45.00	45.00
Harvesting & Cutting	1	22.00	22.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	22.00	22.00
Labor/Machinery Subtotal			130.60
Total "Field Production Costs"			213.12
GROSS MARGIN PER FEDDAN			186.88

Table V

Crop Budget Details: Base Case

(Menufia continued)

LONG BERSEEM	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	4.00	200.00	800.00
Subsequent Cuts	1.00	152.00	152.00
Total Revenue			952.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	30.00	30.00
N	.00	.34	.00
P2O5	15.00	.30	4.46
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	61.00	.64	39.02
P2O5 (Free Market)	38.00	.53	20.29
K2O (Free Market)	100.00	.23	22.70
Manure	1.00	8.00	8.00
Agrochemicals	1.00	.00	.00
Material Subtotal			124.46
Operations	Unit	Cost	Total
Land Preparation	1	22.00	22.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	6.30	6.30
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	7.00	7.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	70.00	70.00
Harvesting & Cutting	1	54.00	54.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			215.80
Total "Field Production Costs"			340.26
GROSS MARGIN PER FEDDAN			611.74

Table V

Crop Budget Details: Base Case

(Menufia continued)

BROAD BEANS	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	1.55	516.00	799.80
Stalks tonnes	1.50	60.00	90.00
Total Revenue			889.80
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	47.51	47.51
N	15.50	.34	5.23
P2O5	30.00	.30	8.92
K2O	30.00	.13	3.78
Foliar (l.)	.00	3.00	.00
N (Free Market)	10.50	.64	6.72
P2O5 (Free Market)	20.00	.53	10.68
K2O (Free Market)	50.00	.23	11.35
Manure	1.00	13.00	13.00
Agrochemicals	1.00	.00	.00
Material Subtotal			107.18
Operations	Unit	Cost	Total
Land Preparation	1	33.00	33.00
Planting	1	18.00	18.00
Replanting	1	3.60	3.60
Transplanting	1	.00	.00
Fertilizing	1	4.50	4.50
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	16.20	16.20
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	54.00	54.00
Irrigation	1	40.00	40.00
Harvesting & Cutting	1	20.00	20.00
Threshing & Winrowing	1	30.00	30.00
Transportation & Packing	1	27.00	27.00
Labor/Machinery Subtotal			246.30
Total "Field Production Costs"			353.48
GROSS MARGIN PER FEDDAN			536.32

Table V

Crop Budget Details: Base Case

(Menufia continued)

TOMATOES	Production Months		7
REVENUE			
Projected Gross Income	Units	Price	Total
Tonnes	10.50	150.00	1575.00
	.00	.00	.00
Total Revenue			1575.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Transplants (1,000)	25.00	3.00	75.00
N	150.00	.34	50.63
P2O5	50.00	.30	14.86
K2O	50.00	.13	6.30
Foliar (l.)	5.00	3.00	15.00
N (Free Market)	116.00	.64	74.20
P2O5 (Free Market)	50.00	.53	26.69
K2O (Free Market)	200.00	.23	45.40
Manure	1.00	20.00	20.00
Agrochemicals	1.00	30.00	30.00
Material Subtotal			358.09
Operations	Unit	Cost	Total
Soil preparation	1	30.00	30.00
Planting	1	18.00	18.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	8.00	8.00
Chem. Application- Mech	1	17.00	17.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	54.00	54.00
Irrigation	1	54.00	54.00
Harvesting & Cutting	1	50.00	50.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	120.00	120.00
Labor/Machinery Subtotal			351.00
Total "Field Production Costs"			709.09
GROSS MARGIN PER FEDDAN			865.91

Table U

Crop Budget Details: Base Case

Sohag Governorate

WHEAT	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	1.98	247.00	489.06
Straw tonnes	2.22	110.00	244.20
Total Revenue			733.26
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	30.70	30.70
N	70.00	.33	22.78
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	50.45	.62	31.38
P2O5 (Free Market)	9.67	.53	5.17
K2O (Free Market).	.00	.23	.00
Manure	1.00	12.00	12.00
Agrochemicals	1.00	11.20	11.20
Material Subtotal			117.70
Operations	Unit	Cost	Total
Land Preparation	1	45.00	45.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	9.00	9.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	77.00	77.00
Harvesting & Cutting	1	50.00	50.00
Threshing & Winrowing	1	30.00	30.00
Transportation & Packing	1	30.00	30.00
Labor/Machinery Subtotal			254.50
Total "Field Production Costs"			372.20
GROSS MARGIN PER FEDDAN			361.06

Table W

Crop Budget Details: Base Case

(Sohag continued)

MAIZE	Production Months		3
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	2.00	312.00	624.00
Stalks tonnes	2.17	25.00	54.25
Total Revenue			678.25
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seeds	1.00	12.00	12.00
N	93.00	.33	30.26
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	4.00	3.00	12.00
N (Free Market)	19.12	.62	11.87
P2O5 (Free Market)	.60	.53	.32
K2O (Free Market)	.00	.23	.00
Manure	1.00	20.00	20.00
Agrochemicals	1.00	.00	.00
Material Subtotal			90.95
Operations	Unit	Cost	Total
Soil preparation	1	45.00	45.00
Planting	1	20.00	20.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	9.00	9.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	5.00	5.00
Cultivation	1	30.00	30.00
Irrigation	1	35.00	35.00
Harvesting & Cutting	1	10.00	10.00
Threshing & Winrowing	1	40.00	40.00
Transportation & Packing	1	15.00	15.00
Labor/Machinery Subtotal			209.00
Total "Field Production Costs"			299.95
GROSS MARGIN PER FEDDAN			378.30

Table U

Crop Budget Details: Base Case

(Sohag continued)

SUGARCANE	Production Months		12
REVENUE			
Projected Gross Income	Units	Price	Total
Cane tonnes	39.00	34.00	1326.00
Stalks tonnes	1.00	250.00	250.00
Total Revenue			1576.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Setts	1.00	62.50	62.50
N	222.73	.33	72.46
P2O5	48.00	.30	14.33
K2O	96.00	.13	12.10
Foliar (l.)	7.00	3.00	21.00
N (Free Market)	.00	.62	.00
P2O5 (Free Market)	.00	.53	.00
K2O (Free Market)	.00	.23	.00
Manure	1.00	.00	.00
Agrochemicals	1.00	10.00	10.00
Material Subtotal			192.41
Operations	Unit	Cost	Total
Land Preparation	1	90.00	90.00
Planting	1	100.00	100.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	30.00	30.00
Chem. Application- Mech	1	40.00	40.00
Chem. Application- Labour	1	.00	.00
Weeding	1	.00	.00
Thinning	1	12.00	12.00
Cultivation	1	40.00	40.00
Irrigation	1	120.00	120.00
Harvesting & Cutting	1	200.00	200.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	50.00	50.00
Labor/Machinery Subtotal			682.00
Total "Field Production Costs"			874.41
GROSS MARGIN PER FEDDAN			701.59

Table U

Crop Budget Details: Base Case

(Sohag continued)

LONG BERSEEM	Production Months		5
REVENUE			
Projected Gross Income	Units	Price	Total
1st Cut	1.00	200.00	200.00
Subsequent Cuts	3.00	200.00	600.00
Total Revenue			800.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	30.00	30.00
N	.00	.33	.00
P2O5	15.00	.30	4.48
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	60.60	.62	37.69
P2O5 (Free Market)	11.00	.53	5.88
K2O (Free Market)	23.85	.23	5.41
Manure	1.00	6.30	6.30
Agrochemicals	1.00	.00	.00
Material Subtotal			89.76
Operations	Unit	Cost	Total
Land Preparation	1	25.00	25.00
Planting	1	4.50	4.50
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	7.00	7.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	9.00	9.00
Weeding	1	.00	.00
Thinning	1	.00	.00
Cultivation	1	.00	.00
Irrigation	1	24.00	24.00
Harvesting & Cutting	1	54.00	54.00
Threshing & Winnowing	1	.00	.00
Transportation & Packing	1	60.00	60.00
Labor/Machinery Subtotal			183.50
Total "Field Production Costs"			273.26
GROSS MARGIN PER FEDDAN			526.74

425

Table U

Crop Budget Details: Base Case

(Sohag continued)

SORGHUM	Production Months		4
REVENUE			
Projected Gross Income	Units	Price	Total
Grain tonnes	1.70	300.00	510.00
Stalks tonnes	2.00	25.00	50.00
Total Revenue			560.00
EXPENDITURES	Units	Price	Total
Material Inputs:			
Seed	1.00	7.80	7.80
N	69.75	.33	22.70
P2O5	22.50	.30	6.72
K2O	.00	.13	.00
Foliar (l.)	.00	3.00	.00
N (Free Market)	14.79	.62	9.20
P2O5 (Free Market)	6.00	.53	3.21
K2O (Free Market)	.00	.23	.00
Manure	1.00	15.00	15.00
Agrochemicals	1.00	.00	.00
Material Subtotal			64.62
Operations	Unit	Cost	Total
Land Preparation	1	35.00	35.00
Planting	1	10.00	10.00
Replanting	1	.00	.00
Transplanting	1	.00	.00
Fertilizing	1	7.00	7.00
Chem. Application- Mech	1	.00	.00
Chem. Application- Labour	1	.00	.00
Weeding	1	5.00	5.00
Thinning	1	10.00	10.00
Cultivation	1	.00	.00
Irrigation	1	80.00	80.00
Harvesting & Cutting	1	10.00	10.00
Threshing & Winrowing	1	.00	.00
Transportation & Packing	1	15.00	15.00
Labor/Machinery Subtotal			172.00
Total "Field Production Costs"			236.62
GROSS MARGIN PER FEDDAN			323.38

Table X

World Prices of Cotton, Rice, and Sugarcane

1984-5 - 1987-8

	A	B	C	D	E	F	G	H	I	J	K
1											
2	PRICE FOR ELS COTTON [1]										
3	(EGYPT IS A NET EXPORTER OF LINT COTTON)										
4											
5	TITLE	UNIT	1984/85		1985/86		1986/87		1987/88		
6	WORLD PRICE, LINT COTTON										
7	ALEXANDRIA	U.S$/M.K.	132.10		143.40		175.10		212.30		
8											
9	EXCHANGE RATES										
10	OFFICIAL RATE	L.E./U.S.$	0.70		0.70		0.70		0.70		
11	MARKET RATE	L.E./U.S.$	1.60		1.90		2.19		2.30		
12											
13	WORLD PRICE, ALEXANDRIA										
14	OFFICIAL RATE	L.E./M.K.	92.47		100.38		122.57		148.61		
15	MARKET RATE	L.E./M.K.	211.36		272.46		383.47		488.29		
16											
17	TRANSPORTATION COSTS										
18	FROM GIN TO ALEX.	L.E./M.K.	0.40		0.53		0.53		0.60		
19											
20	WORLD PRICE AT GIN										
21	OFFICIAL RATE	L.E./M.K.	92.07		99.85		122.04		148.01		
22	MARKET RATE	L.E./M.K.	210.96		271.93		382.94		487.69		
23	LINT YIELD K.G./M.K. SEED COT.	YIELD/M.K.	50.00		50.00		50.00		50.00		
24											
25	OTHER JOINT PRODUCTS										
26	DOMESTIC PRICE SCARTO	L.E./M.K.	50.00		100.00		150.00		200.00		
27	SCARTO YIELD K.G./M.K. SEED COT.	YIELD/M.K.	2.00		2.00		2.00		2.00		
28	WORLD PRICE COTTONSEED [2]										
29	OFFICIAL RATE	L.E./M.T.	134.39		103.66		84.29		93.80		
30	MARKET RATE	L.E./M.T.	334.19		313.29		305.49		353.04		
31	YIELD K.G./M.K. SEED COT.	YIELD/M.K.	105.00		105.00		105.00		105.00		
32											
33	VALUE ALL JOINT PRODUCTS										
34	PER M.T. SEED COTTON [3]										
35	OFFICIAL RATE	L.E./M.T.	686.06		728.47		869.15		1053.07		
36	MARKET RATE	L.E./M.T.	1574.02		1960.80		2673.11		3382.60		
37											
38	SEED PROCESSING MARGIN										
39	PER M.T. SEED COTTON	L.E./M.K.	8.61		11.45		12.59		14.50		
40		L.E./M.T.	54.67		72.70		79.94		92.00		
41											
42	WORLD PRICE SEED COT. AT GIN										
43	PER M.T. SEED COTTON										
44	OFFICIAL RATE	L.E./M.T.	632.20		655.77		789.21		961.01		
45	MARKET RATE	L.E./M.T.	1520.25		1888.10		2593.18		3290.53		
46											
47	TRANSPORTATION COSTS										
48	FROM FARM TO GIN	L.E./M.K.	0.76		1.02		1.03		2.00		
49		L.E./M.T.	4.83		6.48		6.54		12.70		
50											
51	WORLD PRICE SEED COTTON										
52	AT THE FARM										
53	OFFICIAL RATE	L.E./M.T.	627.37		649.30		782.67		948.31		
54	MARKET RATE	L.E./M.T.	1515.43		1881.62		2586.64		3277.84		

PRICE FOR RICE [1]

	A	B	C	D	E	F	G	H	I	J
6	TITLE	UNIT	1984/85		1985/86		1986/87		1987/88	
7	WORLD PRICE, BANGKOK 5% broken	U.S$/TON	252.00		217.00		210.00		230.00	
8										
9	TRANSPORTATION COSTS									
10	BANGKOK TO MIDDLE EAST	U.S$/TON	35.00	•	35.00	•	35.00	•	35.00	
11										
12	TRANSPORTATION COSTS									
13	ALEXANDRIA TO MIDDLE EAST	U.S$/TON	25.00	•	25.00	•	25.00	•	25.00	
14										
15	WORLD PRICE, ALEXANDRIA	U.S$/TON	262.00		227.00		220.00		240.00	
16										
17	EXCHANGE RATES									
18	OFFICIAL RATE	L.E./U.S.$	0.70		0.70		0.70		0.70	
19	MARKET RATE	L.E./U.S.$	1.60		1.90		2.19		2.30	
20										
21	WORLD PRICE, ALEXANDRIA									
22	OFFICIAL RATE	L.E./TON	183.40		158.90		154.00		168.00	
23	MARKET RATE	L.E./TON	419.20		431.30		481.80		552.00	
24										
25	TRANSPORTATION COSTS									
26	FROM RICE MILL TO ALEX.	L.E./TON	7.30		7.30		7.30		7.30	
27										
28	WORLD PRICE AT MILL									
29	OFFICIAL RATE	L.E./TON	176.10		151.60		146.70		160.70	
30	MARKET RATE	L.E./TON	411.90		424.00		474.50		544.70	
31										
32	JOINT PRODUCT									
33	DOMESTIC PRICE OF HUSK	L.E./TON	11.60		8.25		10.56		10.16	
34	HUSK YIELD/TON UNMILLED RICE	YIELD/TON	0.33		0.33		0.33		0.33	
35										
36	MILLING MARGINS									
37	PER TON OF UNMILLED RICE	L.E./TON	37.95		47.94		55.64		64.58	•
38										
39	VALUE UNMILLED RICE AT MILL [1]									
40	OFFICIAL RATE	L.E./TON	83.87		56.35		46.13		46.44	
41	MARKET RATE	L.E./TON	241.85		238.86		265.76		303.72	
42										
43	TRANSPORTATION COSTS									
44	FROM FARM TO MILL	L.E./TON	0.30		0.30		0.30		0.30	
45										
46	WORLD PRICE UNMILLED RICE									
47	AT FARM									
48	OFFICIAL RATE	L.E./TON	83.57		56.05		45.83		46.14	
49	MARKET RATE	L.E./TON	241.55		238.56		265.46		303.42	
50										

Up 8

	A	B	C	D	E	F	G	H	I	J
1										
2	**PRICE FOR SUGARCANE [1]**									
3										
4	TITLE	UNIT	1984/85		1985/86		1986/87		1987/88	
5	WORLD PRICE RAW SUGAR, CARI	I. S$/TON	114.00		89.00		133.00		148.00	
6										
7	TRANSPORTATION COSTS									
8	CARIBBEAN TO ALEXANDRIA	U.S$/TON	25.00	•	25.00	•	25.00	•	30.00	
9										
10	WORLD PRICE RAW SUGAR, ALEX	U.S$/TON	139.00		114.00		158.00		178.00	
11										
12	EXCHANGE RATES									
13	OFFICIAL RATE	L.E./U.S.$	0.70		0.70		0.70		0.70	
14	MARKET RATE	L.E./U.S.$	1.60		1.90		2.19		2.30	
15										
16	WORLD PRICE RAW, ALEX.									
17	OFFICIAL RATE	L.E./TON	97.30		79.30		110.60		124.60	
18	MARKET RATE	L.E./TON	222.40		216.60		346.02		409.40	
19										
20	TRANSPORTATION COSTS									
21	ALEX. TO HAWANDIA TO FACTORIES	L.E./TON	8.84		9.04		9.44		9.84	•
22										
23	WORLD PRICE AT FACTORY									
24	OFFICIAL RATE	L.E./TON	88.46		70.76		101.16		114.76	
25	MARKET RATE	L.E./TON	213.56		207.56		336.58		399.56	
26	RAW SUGAR YIELD/TON SUGARCANE	YIELD/TON	0.11		0.11		0.11		0.11	
27										
28	OTHER JOINT PRODUCTS [2]									
29	INEDIBLE MOLASSES									
30	MOLASSES YIELD/TON SUGARCANE	YIELD/TON	0.03		0.03		0.03		0.03	
31	WORLD PRICE OF MOLASSES [3]									
32	OFFICIAL RATE	L.E./TON	37.70		30.21		40.68		32.94	
33	MARKET RATE	L.E./TON	95.95		97.22		147.53		131.43	
34	BAGASS									
35	BAGASS YIELD/TON SUGARCANE	YIELD/TON	0.26		0.26		0.26		0.26	
36	DOMESTIC PRICE OF BAGASS	L.E./TON	5.00	•	5.00	•	5.00	•	5.00	•
37										
38	VALUE OF ALL JOINT PRODUCTS [4]									
39	OFFICIAL RATE	L.E./TON	110.78		90.91		124.34		135.70	
40	MARKET RATE	L.E./TON	252.74		247.11		390.69		449.01	
41										
42	PROCESSING MARGIN (sugar wpi*)	L.E./TON	36.69	•	39.33	•	37.80		26.30	• •
43	PROCESSING MARGIN (general wpi*)	L.E./TON	28.56	•	32.36	•	37.80		26.30	• •
44										
45	NET VALUE OF SUGARCANE									
46	OFFICIAL RATE (sugar wpi)	L.E./TON	8.45		5.88		9.87		12.47	
47	MARKET RATE (sugar wpi)	L.E./TON	24.63		23.69		40.24		48.20	
48	OFFICIAL RATE (general wpi)	L.E./TON	9.37		6.68		9.87		12.47	
49	MARKET RATE (general wpi)	L.E./TON	25.56		24.49		40.24		48.20	
50										
51	TRANSPORTATION COSTS									
52	FROM FARM TO FACTORY	L.E./TON	1.00		1.20		1.80		3.20	•
53										
54	WORLD PRICE SUGARCANE									
55	AT THE FARM									
56	OFFICIAL RATE (sugar wpi)	L.E./TON	7.45		4.66		8.07		9.27	
57	MARKET RATE (sugar wpi)	L.E./TON	23.63		22.49		38.44		45.00	
58	OFFICIAL RATE (general wpi)	L.E./TON	8.37		5.48		8.07		9.27	
59	MARKET RATE (general wpi)	L.E./TON	24.56		23.29		38.44		45.00	
60										
61	DOMESTIC FARMGATE PRICE	L.E./TON	24.20		27.20		30.50		34.00	
62										
63	[1] Egypt imports refined and raw sugar.									
64	[2] Edible molasses is produced separately, and is not a joint product of raw sugar.									
65	[3] These world prices are derived.									
66	[4] In tons of raw sugar.									

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ANNEX C

REPORT OF SOCIOLOGICAL ASSESSMENTS OF INPUT PRIVATIZATION

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I. SOCIAL SOUNDNESS OF AGRICULTURAL INPUTS DIVESTITURE PROJECT (AN EXECUTIVE SUMMARY)

By assisting the Government of Egypt (GOE) to privatize the distribution of agricultural inputs, mainly fertilizers, pesticides, seeds, animal feed and agricultural machinery, the project seeks to identify, characterize, evaluate, and recommend relevant options for divesting the Principal Bank for Development and Agricultural Credit (PBDAC) of its agricultural production input activities. This social soundness analysis considers attitudes and views of such interested parties as farmers, private businesses, and cooperative institutions towards privatization of the distribution of agricultural inputs.

Farmers Experiences and Attitudes

Attitudes and perceptions of farmers toward private sector dealings are mixed. On the one hand, the private sector has been responsive to farmers' needs stemming from inadequacies of the public sector's distribution of agricultural inputs. On the other hand, farmers tend to feel more secure with government dealings that protect them from private sector exploitation in prices and quality. As such, farmers may be reluctant full-heartedly to endorse privatization of agricultural inputs' distribution. This will, they feel, entail loss of government subsidy, loss of government control, and total exposure to exploitation by the private sector.

In addition, increased opportunities for free choice in brands and quantities may be problematic. Small farmers may be at a disadvantage. They may not afford the luxury of learning through trial-and-error. Efficient and extensive extension services to small farmers is a pre- condition to effectively support farmers in adjusting to the process of privatization. Moreover, greater government supervision is required to ensure quality of inputs and prevent inaccurate commercial advertizing.

Fertilizers

With the exception of foliar fertilizers, nearly all fertilizers are provided to farmers on credit from village banks. A significant proportion of distributed fertilizers rotates in the free market. A well institutionalized black market system for redistribution of fertilizers is in place. It increases the farmers' access to additional needed quantities of fertilizers when demanded; it is a source of extra income to some farmers who augment their overall agricultural income; and it is an important

source of cash for farmers to finance other farming operations and/or to respond to pressing familial financial needs.

More farmers are favorable to the existing fertilizer distribution system than those who are unfavorable. More farmers are against privatization of distribution of fertilizers than those who approve of privatization. For farmers, privatization is equated with increased prices either because of the removal of subsidies and/or fear of private sector exploitation. A small proportion of farmers prefer receiving inputs on credit rather than receiving credit for procurement of inputs for fear of personal misuse of cash in hand. Even those who approve of privatization of distribution of fertilizers request government supervision of prices.

Seeds

A significant proportion of farmers buy seeds from the private sector. Some produce the seeds on their own farms. PBDAC does not distribute all types of seeds. PBDAC's allocated quantities are not always sufficient for actual needs, and are not always available when needed by farmers. Sometimes, the distributed brands and/or qualities are unsatisfactory to farmers.

The only seed that has recently been forced on farmers over fertilizers is the hybrid maize seed. However, farmers do not complain about that, even though they never use it for cultivating maize. Some use the obligatory seeds as flour, while others plant it for animal feed.

Farmers complain about private sector seed prices only if they are able to compare with PBDAC prices. Farmers rarely complain about high prices of seeds that are not distributed by PBDAC.

Opinions vis-a-vis privatization of the distribution of seeds vary. Small farmers tend to question the integrity of merchants and fear exploitation. More sophisticated farmers prefer free market distribution of seeds for availability, less wasted time, and ultimately lower prices through competition. Other farmers prefer free market distribution with close government supervision of prices and quality.

Pesticides

Pesticides are not regularly distributed by PBDAC, specially to non-traditional crop farmers who have to rely more on the private sector for pesticides. Some farmers complain about unjust distribution of pesticides by PBDAC in terms of quantity and quality. Some are skeptical of the effectiveness of the public sector's distribution of pesticides. The irregular availability

of some brands in the public and private sectors encourages large farmers to store pesticides which may expire before use.

On the other hand, some farmers feel insecure in dealing with the private sector in pesticides. In addition to high prices, they feel that the private sector may cheat on quality to maximize profits.

Feed

Though around 85% of Egypt's livestock is owned by small farmers, the official PBDAC system of distribution of animal feed is highly preferential for large projects at the expense of small farmers. Distribution is more regular, procedures are less cumbersome and per head monthly allocations are higher to large project owners than to small farmers. Small farmers have to combine ownership of livestock to be eligible to insurance and to animal feed quota.

The feed quota allocated to small farmers is sufficient for around one third of per head feed requirements. Farmers resort to black market feed, to clover, to flour/bread, and to non-traditional and less nutritious animal feed sold in the private market.

Sufficient quantities and non-increasing prices are main concerns of farmers in relation to privatization of feed distribution. Farmers who feel more secure with government intervention to reduce exploitation by merchants request close government supervision.

Agricultural Machinery

PBDAC's credit facilities for agricultural machinery are the only plus point for PBDAC. Farmers may buy machinery from dealers on credit from PBDAC with an extra commission of around 3% for PBDAC. Some farmers prefer dealing directly with dealers on short-term credit than through PBDAC to reduce overall costs.

Small farmers rely more heavily on renting machinery from the private sector. The private sector has efficiently and effectively responded to the farmers' renting needs. With sufficient competition, prices are held down to a comparable level with renting prices of agricultural cooperatives. Moreover, farmers could rent the machinery from other farmers on credit and repay at a later date.

Private Sector Views on Privatization

The private sector has been successful in gradually expanding its role and bridging gaps in the process of the public sector's distribution of agricultural inputs. The private sector imports certain inputs for public sector distribution, imports and distributes needed inputs and brands not dealt with by the public sector, and participates in redistributing some of the public sector's distributed inputs.

Representatives of the private sector at the central level approve of privatization although they tend to be skeptical that the government will privatize all agricultural operations because of the existing complexity of interrelationships. They are of the opinion that privatization will improve input distribution services and will ultimately lower prices. The private sector's involvement will simplify procedures to farmers, guarantee prompt availability of inputs, provide greater choices to farmers, and eliminate black market dealings. To increase sales, the private sector will be more responsive to client needs, will mobilize resources best, and increase system efficiency to cut down on costs by reducing overhead costs and minimizing waste.

The major constraints on the private sector's increased involvement are financing, governmental interventions in terms of changing policies, procedures and regulations, and the possibility of competition with lower public sector prices. Storage facilities and distribution networks are not viewed as considerable constraints, especially if financing is secured.

Cooperative Institutions

So far, the existing agricultural cooperative institutions are not geared to be responsive to farmers' needs. For decades agricultural cooperatives have been used mainly to increase government control over farming operations and to ensure equity among farmers. Participation of farmers in cooperative operations is minimal.

Agricultural cooperatives could, however, play a vital role in protecting small farmers' interests vis-a-vis the open market, especially after many years of reliance on the government. With such an elaborate cooperative infrastructure in place, it is recommended that national efforts be directed towards instituting real cooperative institutions and increasing member participation and control. The required conditions for the success of agricultural cooperative institutions include :

* Absolute volunteerism in membership;
* Greater participation of the cooperative's General Assembly;

* Prompt distribution of transaction returns among the members according to size of transactions carried out;
* Increased supervision and control of hierarchial cooperative structures and reduction of government intervention and control; and
* Increased awareness of potential members,(i.e., farmers), of rights and obligations of cooperative members, and not only as beneficiaries of allotted services.

II. FARMERS' EXPERIENCES WITH THE PRIVATE SECTOR

This section is based on a content analysis of questions included in interviews of 284 farmers from Upper Egypt (governorates of Minia and Qena) carried out in November 1986. Half the sample included farmers with holdings less than 3 feddans; 37%, farmers with holding between 3 and less than 10 feddans; and the rest (13%) were farmers with holdings of ten feddans or more.

Table 1 demonstrates the degree of exposure of the three categories of farmers to the private sector in terms of procurement of agricultural inputs of seeds, pesticides, and agricultural machinery.

A significant proportion of the interviewed farmers (41%) buy seeds from the private market and some produce needed seeds on their own farms. Farmers buy seeds from the market for a variety of reasons. Not all required seeds are distributed by PBDAC, e.g., vegetable and clove seeds. Quantities distributed by PBDAC are not always sufficient for actual needs, especially for beans and soya beans. Sometimes seeds are not available in due time for farmers' needs, or are not satisfactory in terms of kind or quality. Seeds that are distributed through PBDAC, however, provide solid grounds for farmers to compare prices with the private market, and they often mention the differences in prices between both sectors. The differences in prices as reported range between 30-120% for beans. Farmers do not complain about the high prices of private market seeds that are not distributed by the bank.

Pesticides are not regularly distributed by PBDAC. So more farmers (49%), especially farmers with large holdings (65%), buy pesticides from the market. Attitudes and perceptions of farmers towards the private market versus PBDAC distribution of agricultural chemicals vary. Almost all complain from the very high cost of pesticides in the free market, and some feel that PBDAC distribution of pesticides is not done justly and that influential farmers have first choice in quality and quantity. Others are skeptical of the quality of pesticides distributed by PBDAC, and believe they are not effective and/or do not conform to modern agricultural scientific knowledge. On the other hand, there are farmers who feel more secure in dealing with PBDAC than the private sector because they feel the private sector may cheat in quality to maximize profits. One farmer stated that he was tired of the free market and he would prefer to buy all his pesticide requirements from PBDAC if possible at "whatever price".

Small farmers buy agricultural machinery from the free market to a lesser extent than intermediate and large farmers. Most of the machinery bought from the free market is irrigation equipment. Comparison of price differences between PBDAC and the free market was never mentioned. PBDAC credit facilities for agricultural machinery seem to be the plus point for buying agricultural machinery from PBDAC.

Small farmers extensively rely on renting agricultural machinery from the market. Reliance on rentals decreases with the increase in the size of land holdings. Large farmers have greater chances to invest in agricultural machinery and, apparently, greater access to renting agricultural cooperatives' machinery. Cost of renting agricultural machinery from the market is not much higher than that of the cooperatives. Farmers have no difficulty in renting the machinery they require at the right time from village market sources. Agricultural cooperative machines for rent are scarce and not well maintained, and small farmers need special connections they often lack in order of secure access to needed equipment. Farmers may rent the machinery from other farmers on credit and repay after selling their crops.

Attitudes and Perceptions Toward Private Sector Dealing

From Table 2, it becomes obvious that the basic complaint of farmers related to private sector dealings is the level of prices. To farmers, government distribution of agricultural inputs means controlled, subsidized prices. Free market distribution means higher prices due to the mechanism of supply and demand, commercial profits, and, to a certain extent, exploitation, especially when the supply is lower than the demand. Farmers feel that they are at a disadvantage vis-a-vis the private sector because the high price is set, the farmer has no choice, and consequently the merchant has no difficulty in selling. Some farmers are aware of inflation and continuous escalation of prices in the absence of government intervention. The continuous devaluation of Egyptian currency increases the cost of imported goods, especially pesticides.

Farmers have almost no difficulties with transporting agricultural inputs procured through the private sector. Almost all indicated that transportation costs are on the buyer and they face no problems in renting transportation facilities. The few complaints offered were in relation to the high cost of transportation, or to the risk of transporting fertilizers bought from the black market.

Delivery time is no problem with the private market; it is a "cash and carry" system. If cash is available, one gets the inputs

immediately. The few expressed problems with delivery were mainly related to difficulties farmers may encounter in collecting the required amount from the black market, and/or in locating and buying black market fertilizers from different sources. A difficulty expressed by a few farmers is the occasional shortage in certain brands of inputs which compels them to shop extensively to find them.

Financial transactions in the free market are extremely simple, so farmers face no accounting difficulties. The merchant sets the price and the farmer pays and receives his merchandise and that ends the transaction. If the farmer does not have the whole amount of money available in cash he has to find a way to raise it through borrowing or selling something he owns.

Since most dealings are with merchants themselves and not with employees, there is no occasion for tips. A couple of farmers mentioned that they provide tips to ensure good quality. Others mentioned paying tips to tractor or truck drivers.

Large farmers complain more frequently than small farmers that they face problems in finding the kind or quality of agricultural inputs they want in the free market. However, the majority of farmers feel that every kind may be secured from the market if they could afford it. Few farmers feel more confident in buying inputs from the "government" than from the market, especially in relation to seeds and pesticides. Market seeds may not be clean, pure, or well stored. Pesticides may be of low quality, mixed or spoiled. Few are of the opinion that the government is more concerned about agricultural output, so it distributes the best, while merchants may cheat. Even with agricultural machinery, it is safer to buy from the public sector.

It seems that with this situation of governmental and free market distribution of agricultural inputs, farmers gain from low subsidized prices and still have access to free market advantages if they can afford the costs. Almost all required varieties are available in the free market on a "cash and carry" basis, and farmers can easily resort to it if PBDAC does not deliver. By having the best of both systems, farmers may be quite reluctant to full-heartedly endorse privatization of agricultural inputs distribution, because it would entail loss of government subsidy and control as well as total exposure to free market exploitation.

TABLE 1

EXPOSURE OF FARMERS TO PRIVATE SECTOR
IN PROCUREMENT OF SOME AGRICULTURAL INPUTS
BY SIZE OF HOLDING
(N. 284, Nov. 1987)

	< 3 F.	3-<10 F.	10 + F.	Total
Number of Farmers	142	105	37	284
Percentages who :				
Buy seeds from market	42	37	46	41
Buy pesticides from market	44	51	65	49
Buy agricultural machinery from market	14	34	49	26
Rent agricultural machinery from market	90	80	51	81
Not exposed to private market	8	14	16	12

TABLE 2

FARMERS' PERCEPTION OF PROBLEMS OF
THE PRIVATE MARKET (BY SIZE OF HOLDING)
(N. 251, Nov. 1987)

	< 3 F.	3-<10 F.	10 + F.	Total
Number of Farmers	130	89	31	251
Percentages who find :				
Prices are high	83	89	93	86
Difficulty in transportation	7	6	16	8
Problems in delivery time	2	6	6	4
Problems in settling accounts	2	3	0	2
Problems with tipping	1	7	3	4
Limited choice	17	24	39	22

III. FARMERS' PRACTICES AND ATTITUDES TOWARD DISTRIBUTION OF AGRICULTURAL INPUTS

This section presents findings of in-depth interviews of 20 farmers from lower Egypt. Interviewed farmers represent variant size holdings: small farmers with less than 3 feddans (8), medium farmers of 3 to less than 10 feddans (9) and big farmers of more than 10 feddans (3). The interview collected information on the extent of dealings with rural banks and the free market, and on views of experiences with each and preferences as to the source(s) of distribution of seeds, pesticides, fertilizers, animal feed and agricultural machinery.

Seeds

Farmers obtain seeds for traditional crops from PBDAC. They may also produce their own seeds and buy seeds from other farmers. Few farmers reported that they buy seeds from the market, especially for clover, if they do not appreciate the quality of seeds available at the Bank. There are no complaints about the Bank's system of distribution of seeds in terms of quality, quantity, and price.

Farmers who plant vegetables heavily rely on the private market for seeds. Small farmers tend to be more insecure with seeds bought from the free market than with seeds bought from the Bank, i.e: the government. They are apprehensive of merchant cheating in quality and price.

Large farmers complain about the high prices of the private market. Sometimes the type of seeds needed is in short supply in the market, so they have to make sure to buy seeds immediately when available. When seed packages are sealed, farmers are sure of the quality.

The only seed that has recently been forced on farmers over fertilizers is the hybrid maize seed. However, farmers do not complain about that, even though they never use it for cultivating maize; hybrid maize seeds require early planting for high yields and farmers prefer to leave the clover longer on their farms. Some use the obligatory seeds as flour, while others plant it for animal feed.

It has been reported that firms which import vegetable seeds for PBDAC distribution also import seeds for free market distribution. With special influence, merchants have access to PBDAC's distributed seeds with subsidized prices and resell

them to farmers at private sector prices.

Farmers' attitudes toward privatization of seed distribution vary. Small farmers have no confidence in the integrity of merchants. They do not believe in the power of competition to improve services and/or reduce prices; merchants could create a cartel and exploit farmers. On the other hand, more sophisticated farmers prefer free market distribution of seeds to ensure prompt availability, decreased prices, and less wasted time to conform with Bank distribution requirements. Others prefer free market distribution with close government supervision of prices and quality.

Pesticides

For highly controlled crops, like cotton, the MOA sets a schedule for pest control that is supervised by the agricultural cooperatives, and the farmers are billed for the service. Farmers supervise operations on their fields and try to satisfy laborers so the operation is done effectively. There are no complaints about this system.

To be able to obtain pesticides from the Bank, the farmer has to inform the village agricultural supervisor, who then checks the field, prescribes the kind, and specifies the quantity of the pesticide needed, all of which are then authorized by the agricultural cooperative director. The farmer then secures the quantity from the Bank, assuming its availability and the presence of the relevant employees.

For vegetables and fruits, farmers rely heavily on the free market. Prices are high and depend on the supply and demand at the time. Due to the urgent need for pesticides, large farmers may resort to storing pesticides, and consequently suffer the risk of expiration of product effectiveness.

Small farmers who mainly cultivate traditional crops prefer Bank distribution of pesticides, although they may prefer smaller quantities. The Bank's prices are lower than the free market's; they are fixed; their quality and effectiveness are guaranteed; pesticides are secured on credit; and the spraying process is more convenient.

Vegetable and fruit farmers prefer privatization of pesticide distribution to avoid the Bank's delaying procedures.

Animal Feed

The official PBDAC system of distribution of animal feed is highly preferential for large projects at the expense of small

farmers who hold around 85% of livestock. Large project owners receive higher per head monthly allocations than small farmers (150 kg. per head per month vs. 100 kg.). Distribution is more regular to large owners and procedures less cumbersome than to small farmers. Large owners could get their animal feed directly from the mills and pay PBDAC's commission. They are not confronted with regular, almost monthly, check ups for count of heads, as is the case with the small farmers.

For small farmers to have access to the Bank's distributed animal feed, each owner has to insure at least five head fattening and ten milking cattle. To accommodate such regulations, farmers get together and insure their livestock under one name, and animal feed is distributed to that person; he in turn redistributes the feed to other sharing farmers. A supervision committee visits the farmers almost once a month to check on the number of livestock held. If the committee finds the number less than the required minimum, it cancels the whole insurance deal. Insured livestock is identified by a metal ring on the ear of the cattle. When members of the committee arrive in the village, farmers hasten to collect the cattle from different homes, a tedious operation especially for fattening cattle. Moreover, if the animal loses the metal ring, it is immediately excluded from the count. Farmers report that in the market cattle that have cut ears are sold for half the market price because the new owner will never have the opportunity to get feed from the Bank.

After the committee confirms the eligibility for the insurance, it sends the appropriate papers to the Bank. For the farmer to have access to his monthly quota of feed, the necessary papers and the relevant employees have to be present at the Bank, which may necessitate several trips. Sometimes feed is not available for a month or two, in which case farmers have to forfeit a monthly allotment. Most of the time, the received feed sacks are highly underweight (50-60 kg.rather than 75 kg.). Farmers report that the feed is removed from the sacks at the mandoubias. Farmers who have special contacts at the district banks obtain feed from the district banks to avoid underweight sacks from the mandoubias.

The quantity of animal feed distributed through the Bank provides one-third of annual feed required per head. Farmers use clover, flour, and sometimes bread to feed their livestock. They also buy the Bank's animal feed from the black market or buy another less nutritious animal feed which is sold in the free market and sometimes distributed by the agricultural cooperatives when storage space is available.

There are three sources for black market feed: large project owners, small farmers in need of cash, and the stolen feed from Bank storage (Shounas). An L.E.15 sack at the Bank is sold for about L.E.27 in the black market.

Increased prices are the only concern of farmers in relation to privatization of feed distribution. Farmers who feel more secure with government intervention to reduce exploitation by merchants request close governmental supervision. Some farmers prefer eliminating the livestock insurance system and freeing the feed distribution, but with insurance of sufficient quantities so prices do not rise due to merchant exploitation of shortages.

Fertilizers

The distribution of fertilizers is more or less stable. Farmers receive their assigned quotas, which are specified by the agricultural cooperative on the basis of crops and size of cultivated land. Fertilizers are distributed twice a year by PBDAC. A significant portion of PBDAC distributed fertilizers enters the black market. Vegetable and fruit farmers need more fertilizers than assigned. Traditional crop farmers may be able to spare some fertilizers, especially if animal manure is used. There are a number of sources for black market fertilizers: large farmers who receive more than they need, small farmers who can spare part of the allocated amount, farmers who are in immediate need of cash and sell part of the allocated fertilizers and re- buy it from the black market when needed, and farmers who cultivate reclaimed land that is not under the jurisdiction of the agricultural cooperatives.

There is general satisfaction among farmers with the PBDAC's system for distribution of fertilizers. Additional quantities are not difficult to find in the black market. Most of the income generated from black market dealings return to farmers, whether large or small. Merchants get a small mark-up. Hence, the system is not considered unjust.

Not all farmers favor free market distribution of fertilizers. They are mainly concerned about high prices and exploitation by merchants. Buying fertilizers on credit is also a positive dimension and to farmers, especially small farmers, agricultural inputs on credit is better than cash for buying inputs.

Agricultural Machinery

Small farmers heavily rely on rented agricultural machinery from other farmers and no complaints. Farmers may buy machinery, if available, from PBDAC on credit, or they may buy directly from dealers on short-term credit.

Bank employees do not pressure farmers to deal with specific dealers, although the possibility does exist. However, farmers pay an extra 3% for buying agricultural machinery from dealers and not

the Bank. Farmers complain about the high interest rates of the Bank and the extra amounts added to the loan. They feel the Bank is becoming too "commercial" and is not directed enough toward the needs of the farmers. It has been reported that farmers do not receive any interest on their deposited bank funds the month they remit the funds and the month they cash them. However, loan interests start on the day they receive the credit. Some farmers prefer to buy machinery directly from dealers on short-term credit rather than receive credit from the Bank.

IV. VIEWS OF THE PRIVATE SECTOR ON PRIVATIZATION OF DISTRIBUTION OF AGRICULTURAL INPUTS

Introduction

To solicit attitudes and opinions of representatives of the private sector, a questionnaire was distributed to the members of the Agricultural Committees of the American Chamber of Commerce in Cairo and the Egyptian Businessmen's Association. Only 24 questionnaires were returned, four of which did not represent private businessmen's attitudes but rather those of farm producers and consulting firms. The following presents the analysis of the findings of the 20 returned questionnaires.

Current Role in Distribution of Inputs and Desire for Future Expansion

Fertilizers

Four businessmen in the sample (20%) are currently involved in the distribution of fertilizers as importers (2) and/or as manufacturers (2). Only one manufacturer of fertilizers distributes at the governorate and district levels. All others distribute centrally.

All those handling fertilizers have indicated interest in expanding their involvement in addition to five others (25%) who have indicated interest in distributing fertilizers. But they are mainly interested in importing fertilizers and distributing at the central level. Only one indicated interest in distributing at the governorate level.

Pesticides

Six businessmen in the sample (30%) deal with pesticides as importers (5) and/or distributors (2), and they all distribute at the central level only. They all are willing to expand their operations in addition to two more who do not deal with pesticides and are willing to consider involvement. Two are willing to distribute pesticides at the governorate level. One businessman indicated an interest in the manufacturing of pesticides.

Seeds

Only three sampled businessmen (15%) currently deal with distribution of seeds as importers and/or distributors and only one distributes seeds at the governorate and district levels. Four are willing to participate in distribution of seeds mainly as importers (4) and/or distributors (3) at the central level. Only one is willing to distribute at the governorate level.

Feed

Those involved in the process of distribution of feed are five (25% of the sample). They are mainly importers/manufacturers and only two distribute feed at the governorate and district levels. All are willing to expand operations in addition to one ready to start and expand activities in feed distribution. However, only one is willing to expand distribution operations at the district level.

Agricultural Machinery

The highest proportion of respondents (35%) deal in the importation and distribution of agricultural machinery and eight have indicated interest in expanding their activities as importers (7) and/or distributors (3), mostly at the central level. Almost all are importers (7) and three distribute, but only one distributes at tne governorate and district levels.

Jute Bags

Three respondents (15% of the sample) participate in the distribution of jute bags. One is a distributor at the central level, one is an importer, manufacturer, and distributor at the governorate and district levels, and the third is a manufacturer who distributes only at the central level. Only two respondents have indicated willingness to expand operations in addition to one respondent who already imports a number of agricultural inputs but is only willing to import and distribute centrally.

Agricultural Products

Only two respondents (10%) deal in distribution of agricultural products. One is an exporter who did not indicate interest in expanding operations, and the other is a producer/distributor at the governorate level who is willing to expand. No others indicated interest in involvement in distribution of agricultural products.

Opinions and Views on Privatization

All respondents approve of privatization of distribution of agricultural inputs. In their opinion, free competition will improve service, reduce prices, improve quantity of brands, reduce lengthy procedures, assure continuous accessibility to agricultural inputs, and rationalize quantities used of different agricultural inputs. In addition, bottlenecks in distribution which create the black market would be eliminated.

Specifically, in terms of improvement versus deterioration of service with privatization of the distribution of agricultural inputs, 17 out of 19 good answers expressed the opinion that the service would improve. One was of the opinion that privatization would cause deterioration and one put conditions for improvement of service. Those who believed the quality of service would improve gave a number of reasons, including :

* Simpler procedures to be followed by farmers and distributors;
* Guaranteed availability of inputs when needed by farmers;
* Better maintenance performed by the private sector;
* Greater choice due to the increased alternatives to farmers;
* Increased private sector competition, ultimately improving the quality of service and eliminating monopoly;
* Better and closer follow-up by the private sector;
* The private sector's greater capabilities to mobilize resources in terms of skills, distribution networks, and greater contacts;
* Stronger responsiveness of the private sector to client needs to increase sales; and
* Elimination of the black market.

The only respordent having the opinion that when privatized services will deteriorate bases his opinion on the expectation that importers will be faced with shortages in hard currency, slow government importing procedures, and contractual difficulties with PBDAC, all of which will ultimately affect the prompt availability of the inputs to the farmers. Another respondent stated that service improvement will depend on the price, good timing, and availability of finance.

Respondents were split in their opinions about whether prices will increase or decrease with privatization. Ten out of 19 (53%) believed that prices would decrease; free competition in its own right would reduce prices as compared to those of a monopoly. The private sector's overhead costs would be lower than that of the public sector, which suffers from overemployment and complicated procedures. The private sector would also minimize waste by

improved storage and transportation.

Seven out of 19 respondents (37%) believed prices would increase mainly because of removal of subsidies, the unsubsidized costs of hard currency, and cost of credit for the private sector. Few mentioned that the prices would be higher because of private sector profits, advertisement costs, and higher overhead costs for smaller operations than those of PBDAC.

Two respondents had different opinions. One believed that the prices would increase at first but with free private sector competition would eventually decrease. Another respondent believed that if the farmer sold his produce in the free market, then the input costs would decline relatively and the farmer would eventually be able to improve his profits.

Constraints on Privatization of Distribution

The main constraint as viewed by respondents is the availability of capital. This is viewed as a constraint for all inputs. Some especially mentioned the shortages and unstable prices of hard currency.

The second largest group of opinions perceived constraints on private sector participation in the distribution of agricultural inputs as related to government regulations and policy change.

Public sector competition is another constraint that may discourage the private sector from expanding input distribution activities. As importers and distributors of inputs mainly at the central level, some prefer dealing with the PBDAC with PBDAC responsible for distribution and repayment. Some central businessmen have had bitter experiences competing in the market with the public sector's subsidized prices, especially when black market prices were still lower than free market prices, as is the case of fertilizers.

The distribution network is viewed as a probable constraint by only around one quarter of the businessmen interviewed. They undermined this factor due to either lack of experience or confidence in local dealers. Storage facilities are viewed as a probable constraint to a few, especially in relation to agricultural machinery and agricultural products.

Perceived Time for Full Privatization

Answers vary substantially in terms of how soon the private sector could take over the distribution of various agricultural inputs. For fertilizers, answers were split between two and three

years and, to a lesser extent, four years. For pesticides, one and two years were mentioned by most respondents and three years by a few. The most frequently mentioned duration for seeds was two years followed, by one year then three years. For feed, agricultural machinery, and jute bags two years seem to be the time needed as specified by most respondents. Opinions were split between one and two years and, to a lesser extent, three years for privatization of the distribution of agricultural products.

Conclusion

The private sector in Egypt has been successful in bridging gaps in the agricultural inputs distribution process left by the public sector by importing for the public sector, distributing needed items not dealt with by the public sector, such as vegetable seeds and folian fertilizers, or redistributing public sector inputs , such as fertilizers.

The private sector is willing and capable to expand operations to privatize agricultural input distribution in around three years if financing is accessible, if risks and perceived risks caused by changes in government policies are minimized, and if the private sector does not have to compete with lower public sector prices.

Storage facilities and distribution networks are not perceived to be constraints. There are a number of factors that may have led to underestimating important distribution issues. Central private sector firms are more aware of problems of importation and central distribution. They are less aware of storage and network requirements for distributing inputs to reach farmers at the village level. There is also the probability that central businessmen think more in terms of their experiences, ie.: centrally distributing inputs to PBDAC which in turn is responsible for distribution at the village level. The implications to total privatization of all agricultural inputs may still be not totally appreciated. A third probability is that central businessmen have confidence in existing networks of local dealers and they are sure that the availability of storage facilities is a function of financing.

V. AGRICULTURAL COOPERATIVE INSTITUTIONS IN EGYPT

This section reviews the potentials of agricultural institutions in taking a more vital role for farmers in the processes of distributing agricultural inputs. The historical development of agricultural institutions is first presented, followed by an analysis of weaknesses and strengths of current village agricultural cooperatives.

Historical Perspective

The history of the cooperative movement in Egypt extends to the early 20th. century. The first call for the need for cooperatives as a means of protecting the farmers from the private money-lenders came from the Egyptian educated class, mainly Omar Lutfi, in 1908. He called for the establishment of cooperative companies to serve the needs of the farmers, specifically the small farmers. At that time, there were no established laws and procedures to govern such companies and the Khedieval Agricultural Organization was consulted to formulate regulations for the companies. The first financial cooperative company was established in 1909 to provide credit to its cooperative members. This was followed by the formation of agricultural unions to cover cooperative activities such as distribution of inputs, credit, and marketing.

Nevertheless, all cooperative efforts for protection of farmers during the first two decades of the century were limited in success. Cooperative organization was a novelty and awareness of its implications was limited. In addition, the lack of direct government support, the absence of legislation to guide and organize such cooperative institutions, and the absence of a higher authority to finance and supervise them contributed to the limited expansion of the idea.

Government support for the cooperatives started after the 1923 independence. A Cooperative Department at the Ministry of Agriculture (MOA) supervised the existing cooperative societies. By 1927, cooperative unions and the High Council for Cooperatives were formed. The government also provided credit facilities to cooperatives through a non-specialized bank until the Egyptian Agricultural Credit Bank was established in 1931. The MOA continued to supervise the agricultural cooperatives until 1937 when supervision was entrusted to the Ministry of Finance for two years. Between 1939 and 1960, supervision of cooperatives was under the Ministry of Social Affairs (MOSA).

In terms of providing credit to the farmers, the General Cooperative Bank was established in 1946 with a capital of

L.E.195,000. This bank was dissolved in 1948 to combine with the Egyptian Agricultural Credit Bank, with an increase in the principal capital to L.E.500,000 as a result of the cooperatives' contribution. The government's rationale for the transformation was that the General Cooperative Bank could not efficiently perform its functions without government support and the government was not able to provide support to two banks for agricultural credit. However, the bank was nationalized in 1961 and later became the Principal Bank for Development and Agricultural and Credit (PBDAC) in 1976.

The expansion of the cooperative movement until 1952 was slow and failed to protect small farmers as originally envisaged. It is reported that a number of factors contributed to this limitation such as :

* The influence of large landowners who monopolized the available credit for consumption rather than production purposes and the deprivation of small farmers and tenants from credit facilities for lack of sufficient guarantee;
* Shortages of offices and storage facilities, allowing large landowners to provide such facilities and increase their influence and misuse services;
* Inter-familial conflicts to control agricultural cooperatives benefits; and
* Weakness of financial and operational supervision of cooperatives with increased corruption.

The expansion in agricultural cooperatives, the restriction in size of landownership, and the removal of the power of large landowners occurred after the 1952 revolution. New land reform cooperatives developed, membered by new small owners of land which was confiscated by the government and redistributed to the farmers. The government gradually extended the cooperative system to cover all agricultural areas. The main functions of these cooperatives were :

* To supply farmers with agricultural inputs on credit;
* To organize and supervise cropping patterns of cultivation; and
* To receive produce from farmers for marketing, and to deduct from the revenues the price of land (Land Reform law), land tax, agricultural loans, and other debts.

Between 1961 and 1976, the nationalized Agricultural Credit Bank dealt only with the agricultural cooperatives and was not allowed to deal with individual farmers. The Bank distributed inputs to the cooperatives on credit and the cooperatives redistributed the inputs on credit to the members. With this system, it became imperative for the farmers to become members in the cooperatives. Due to the absence of necessary skills in

cooperatives, the Bank provided the needed manpower for them, such as storage keepers, bookkeepers, accountants, and auditors.

In 1976, Law no.117 was issued to establish the village banks and to allow the PBDAC to deal with individual farmers. PBDAC took over all storage facilities of the agricultural cooperatives, their offices, and the direct supervision of employees who were seconded to the Bank. The functions of the agricultural cooperatives shrank by necessity to supervision control of cropping patterns, and estimation of farmers' needs of agricultural inputs according to the size of cultivated land and crops produced.

Law no.122 in 1980 was issued to organize all types of existing agricultural cooperatives. The law provided the cooperatives with the power to restore their ownership of storage facilities and their functions in distributing agricultural inputs with a saving of 5% of the price of all commodities procured from the government or public agencies. Only around 400 cooperatives have implemented this law and most of them are in the governorate of Sharkia. As reported, PBDAC is usually reluctant to endow cooperatives with input distribution function in order to retain the 5% commission.

The Current Situation of Agricultural Cooperatives

The existing situation and numbers of agricultural cooperatives currently in Egypt are as follows :

I. Credit Cooperative Organizations	
A. Government Agricultural Cooperatives	
1. Multipurpose Cooperatives	
a. Local Level	4166 cooperatives
b. District Level	127 cooperatives
c. Central Governorate Level	22 cooperatives
2. Specialized Agricultural Cooperatives	
a. Local Level	749 cooperatives
b. Central Governorate Level	74 cooperatives
B. General Cooperatives	
National Level	12 cooperatives
C. Agricultural Machinery Cooperatives	
1. Local Level	39 cooperatives
2. Governorate Level	10 cooperatives
3. National Level	1 cooperative
II. Land Reform Cooperative's Organization	
A. Local Level	691 cooperatives
B. District Level	69 cooperatives
C. Governorate Level	18 cooperatives
D. National Level	1 cooperative
III. Land Reclamation Cooperative Organization :	440 cooperatives

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The Central Agricultural Cooperative Union is at the top of the agricultural cooperative structure and is responsible for promotion, training, and coordination of agricultural cooperative movement in Egypt. The multipurpose agricultural cooperatives are chosen for discussion here because they are extensively available at almost all villages in Egypt.

Rural Multipurpose Agricultural Cooperatives

The rural multipurpose agricultural cooperatives are established in almost all mother villages. Within the cooperative structure, they are supervised by the District Cooperative and Central Governorate Cooperative. Within the government structure, they are supervised by the District Agricultural Cooperative Department, the Governorate Agricultural Cooperative Directory, and the Central Under-Secretary for the Agricultural Cooperative Affairs at MOA.

At the local level, the cooperative is controlled by an elected board of directors. Elections, however, are not necessarily real as board members are usually selected as the only nominees. However, it has been reported that the 1987 elections were competitive in certain areas, indicating that the seeds of popular participation in local agricultural cooperatives may be taking root. The interest in board membership stems from the opportunity to increase accessibility to special favors in the distribution of agricultural inputs, in renting agricultural machinery, and in grading agricultural outputs.

By law, 80% of board members have to own 5 feddans or less and the steering committee should include at least 2 members representing small farmers. Board members should be literate, which limits choice in rural areas where illiteracy is around 65% among males. In addition, board members should not be related by more than a fourth degree relationship. The cooperative's general assembly has the legal right to remove board members if their practices are viewed as corrupt. Yet, the general assemblies do not meet often enough and members usually decline participation.

The local cooperative staff includes the director, the auditor, the bookkeeper, the store keeper, and the mechanic. They are all seconded from the MOA and receive 25% of their salaries additional from the cooperative. This indicates the government's subsidization of cooperatives. Positions at local cooperatives have no career opportunities. They are usually filled by new graduates who lack the necessary skills or by older staff who are less motivated. Turnover in these positions is usually high. Hence, the level of efficiency and effectiveness of the staff may restrict the effective functioning of the cooperatives.

The returns on a cooperative's transactions are supposed to

be roughly distributed as follows :

20% Contingency Fund
5% Public Services
5% Welfare Services
5% Agricultural Laborer's Fund
5% Cooperative Training
10% Incentives for Staff
10% Incentives for Board Members
35% Distributed to Cooperative Members as percentage of individual transactions.

Returns for members are rarely distributed. Accounts are kept in a way that eliminates the possibility of estimating the level of transactions preformed by each member. Thus, returns are kept as cooperative savings. Moreover, training funds are not used for effective training to raise required skills of members, board members, and staff.

Cooperatives are authorized to develop special cooperative projects with investments from cooperative members. However, the law specifies that only 25% of net returns are to be distributed to investors. Such returns discourage members from participating in special projects.

Discussion

Regardless of the long history of cooperative ownership, the cooperative movement in Egypt may still be considered as underdeveloped. Two main factors are responsible for this situation. The first factor is related to the fact that cooperative institutions have developed from top-down, resulting in the lack of sufficient knowledge and awareness of the principles of cooperative organizations on the part of staff as well as members. Second, in the last three decades, the government has used agricultural cooperatives mainly to increase government control and equity among farmers. Agricultural growth was never given equal concern. Government control has limited effective popular participation in cooperatives, the corner-stone of any cooperative organization.

The failure of agricultural cooperatives to claim the right of retrieving the physical infrastructure and the function of input distribution is partly due to the administrative and managerial weakness of local agricultural cooperatives and partly due to the strength of PBDAC and its continued refusal to yield its positive returns from distribution of agricultural inputs to cooperatives. Most farmers still perceive the cooperative (gamiya) as the rural bank as long as they go to the same place to secure the agricultural inputs or to remit agricultural products. To them, both represent the government.

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For agricultural cooperatives to replace PBDAC in the distribution of agricultural inputs, following the PBDAC system, is not difficult. With privatization of agricultural input distribution, the cooperatives would be faced with a more complicated task of selection among the various alternatives. On the other hand, agricultural cooperatives could play a vital role on behalf of small farmers to protect their interests vis-a-vis the open market, especially after so many years of reliance on the government.

Certain preconditions have to exist before local cooperatives are successful in maintaining the interest of their members.These conditions include:

* Absolute volunteerism in membership;
* Greater participation in the cooperative's general assembly;
* Prompt distribution of transaction returns among the member according to size of transactions carried out;
* Increased supervision and control of hierarchical cooperative structures and reduction of government intervention and control; and
* Increased awareness of potential members, i.e., farmers, of the rights and obligations of cooperative members in a full sense and not merely as beneficiaries of allotted services

With such an elaborate agricultural cooperative infrastructure in place, it is highly recommended that national efforts be seriously directed toward the augmentation of a real cooperative movement, so as to increase popular participation and control as a viable alternative mechanism for farmers which they are free to choose and to substitute for dealings with the private sector on individual basis.

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Dr.Fakhry Shousha, Dean of Cooperative Institution

Dr.Ibrahim Moharram, Professor of Rural Sociology, Ein Shams University.

Mr.Mohammed Idris, Secretary General, The Central Agricultural Cooperative Union (CACU).

ANNEXES D, E, and F

FINANCIAL ANALYSIS OF PBDAC

Annex D - Income and Expense Statements
(Tables D-1 through D-36)

Annex E - Dependence of Credit Demand on DIstribution of Inputs

Annex F - Asset Value of the BDAC Warehouses

PBDAC HEADQUARTERS, BRANCHES, AND GOVERNORATE BANKS

ARAB REPUBLIC OF EGYPT

April 1989

Annex D

PBDAC'S INCOME AND EXPENSES PER ACTIVITY

Annex D consists of the following tables, which detail for the PBDAC group (Principal Bank, branches and BDACs) the line items of income and expenses for each of PBDAC's twelve activities for the years 1986-1988.

D-1 Agricultural Production Credit - 1986
D-2 Agricultural Production Credit - 1987
D-3 Agricultural Production Credit - 1988
D-4 Investment credits - 1986
D-5 Investment credits - 1987
D-6 Investment credits - 1988
D-7 Banking Transactions - 1986
D-8 Banking Transactions - 1987
D-9 Banking Transactions - 1988
D-10 Fertilizers - 1986
D-11 Fertilizers - 1987
D-12 Fertilizers - 1988
D-13 Seeds - 1986
D-14 Seeds - 1987
D-15 Seeds - 1988
D-16 Pesticides - 1986
D-17 Pesticides - 1987
D-18 Pesticides - 1988
D-19 Feed - 1986
D-20 Feed - 1987
D-21 Feed - 1988
D-22 Spare Parts and Sprayers - 1986
D-23 Spare Parts and Sprayers - 1987
D-24 Spare Parts and Sprayers - 1988
D-25 New Jute Bags - 1986
D-26 New Jute Bags - 1987
D-27 New Jute Bags - 1988
D-28 Supply - 1986
D-29 Supply - 1987
D-30 Supply - 1988
D-31 Commercial Operations - 1986
D-32 Commercial Operations - 1987
D-33 Commercial Operations - 1988
D-34 Fumigation - 1986
D-35 Fumigation - 1987
D-36 Fumigation - 1988

TABLE D-1 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
AGRICULTURAL PRODUCTION CREDIT (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commissions of BDACs	15,410	
1	Salaries (permanent employees)	7,371	1,326	8,697	Commissions settled by BDACs to	3,052	
2	Contract employees	37	17	54	Principal Bank		
5	Bonuses	11,171	1,907	13,078	Commissions settled by branches to	121	
5	Additional pension funds	835	244	1,079	Principal Bank		
5	Legal pension funds	44	39	83	Commissions transferred to Principal	11	
6	Position and expense allowances	4,287	833	5,120	Bank		
7	In-kind benefits	170	75	245		------	18,594
8	Cash benefits	3,819	604	4,424	Late payment penalties		1,093
					Diverse income		596
	Total Bab I	27,735	5,045	32,780	Subsidy		53,299

	Bab II (Goods & Services)				Total income of activity		73,582
	A. Goods						
2	Fuel & lubricants	5	16	21	Income net of expenses		19,763
3	Spare parts & supplies	11	20	31			
5	Books and stationery	15	17	32			
6	Water, electricity, gas	14	15	28			
		------	------	------			
	Subtotal, Goods	45	68	112			
	B. Services						
1	Maintenance	32	28	60			
4	Advertisement & representation	7	13	20			
5	Printing	209	60	270			
6	Transport & communications	305	108	413			
7	Rent of machinery & vehicles	3	1	4			
8	Services by public companies	8	21	29			
9	Taxes & fees	-	1	1			
12	Training	2	1	2			
11	Diverse services	220	64	284			
14	Services to non-employees	96	31	127			
		------	------	------			
	Subtotal, Services	882	328	1,210			
	C. Current Transfers						
1	Taxes & fees on commodities	18	14	32			
2	Depreciation	171	132	303			
3	Rent	162	16	178			
4	Interest & financing expenses	16,930	345	17,275			
6	Interest on bonds	5	2	7			
		------	------	------			
	Subtotal, Current transfers	17,286	509	17,795			
	D. Special Current Transfers						
2	Support to others	11	1	12			
7	Provisions other than deprec.	1,369	384	1,753			
8	Property taxes	3	3	6			
9	Other allocations	124	24	148			
		------	------	------			
	Subtotal, Special Current Trans.	1,507	412	1,919			
	Total Bab II	19,721	1,318	21,039			
	Total Bab I & II	47,456	6,363	53,819			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-2 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
AGRICULTURAL PRODUCTION CREDIT

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Interest income on ag. credit (a)	28,553	
1	Salaries (permanent employees)	7,199	1,297	8,496	Late payment penalties	901	
2	Contract employees	38	13	51	Subsidy	60,126	
5	Bonuses & incentives	13,138	2,402	15,540	Adm. charges (b)	2,898	
5	Additional pension funds	456	102	558		------	92,478
5	Legal pension funds	11	6	18	Income of branches (c):		
5	New pension funds	191	41	232	Cairo	16	
6	Position and expense allowances	4,086	860	4,946	Alexandria	99	
7	In-kind benefits	292	90	381		------	115
8	Cash benefits	3,596	652	4,248			------
	Total Bab I	29,007	5,463	34,470	Total income of activity		92,594
					PBDAC commission (d)		3,819
	Bab II (Goods & Services)						------
	A. Goods				Total net income		88,775
2	Fuel & lubricants	5	24	29	Income net of expenses		22,616
3	Spare parts & supplies	17	21	38			
5	Books and stationery	12	24	37			
6	Water, electricity, gas	13	16	29			
		------	------	------			
	Subtotal, Goods	48	86	133			
	B. Services						
1	Maintenance	37	30	67			
4	Advertisement & representation	17	14	31			
5	Printing	203	108	311			
6	Transport & communications	300	127	427			
7	Rent of machinery & vehicles	1	2	3			
8	Services by public companies	11	29	40			
9	Taxes & fees	3	2	5			
12	Training	-	13	13			
11	Diverse services	308	108	416			
14	Services to non-employees	74	24	98			
		------	------	------			
	Subtotal, Services	954	457	1,410			
	C. Current Transfers						
1	Taxes & fees on commodities	11	19	30			
2	Depreciation	162	215	376			
3	Rent	233	25	258			
4	Interest & financing expenses	24,514	461	24,975			
6	Interest on bonds	-	7	7			
		------	------	------			
	Subtotal, Current Transfers	24,920	727	25,647			
	D. Special Current Transfers						
2	Support to others	9	3	12			
6	Bad debts provision	380	-	380			
7	Provisions other than deprec.	2,518	1,432	3,949			
8	Property taxes	6	4	9			
9	Other allocations	106	42	148			
		------	------	------			
	Subtotal, Special Current Trans.	3,018	1,480	4,498			
	Total Bab II	28,939	2,750	31,689			
	Total Bab I & II	57,946	8,213	66,159			

(a) Difference between the 13% charged to PBDAC by commercial banks and the 4.5% (per season) interest it charges the farmer.

(b) 1% on loan amount, charged when credit is issued.

(c) Share of PBDAC branches in the commission.

(d) Commission on sales of tractors, foliar fertilizers, etc. (Principal Bank's part - subtracted to eliminate double counting).

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-3 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
AGRICULTURAL PRODUCTION CREDIT

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Sub I (Personnel)						
1	Salaries (permanent employees)	8,045	1,357	9,402	Interest income on ag. credit (a)	43,455	
2	Contract employees	47	18	65	Late payment penalties	550	
5	Bonuses & incentives	15,343	2,632	17,975	Interest on late payments	413	
5	Additional pension funds	533	115	648	Adm. charges (b)	626	
5	Legal pension funds	32	10	41		------	45,024
5	New pension funds	211	76	288	Interest subsidy (c)		68,212
6	Position and expense allowances	4,570	936	5,506			------
					Total income of activity		113,235
7	In-kind benefits	428	137	566	Share of principal Bank (5%) (d)		4,758
8	Cash benefits	5,700	907	6,607	Total net income		108,478
	Total Sub I	34,909	6,188	41,096	Income net of expenses		27,161
	Sub II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	5	23	28			
3	Spare parts	22	27	49			
4	Packaging	-	1	1			
5	Books and stationery	14	21	36			
6	Water, electricity, gas	19	22	41			
	Subtotal, Goods	59	95	154			
	B. Services						
1	Maintenance	59	41	100			
3	Diverse services	166	16	182			
4	Advertisement & representation	34	17	51			
5	Printing	219	77	296			
6	Transport & communications	270	103	374			
7	Rent of machinery & vehicles	1	-	2			
8	Services by public companies	8	38	46			
9	Taxes & fees	2	5	7			
12	Training	2	4	6			
11	Diverse services	283	115	398			
14	Services to non-employees	288	25	313			
	Subtotal, Services	1,333	442	1,775			
	C. Current Transfers						
1	Taxes & fees on commodities	18	24	42			
2	Depreciation	153	197	350			
3	Rent	205	21	226			
4	Interest & financing expenses	32,057	200	32,257			
6	Interest on bonds	-	8	8			
	Subtotal, Current Transfers	32,434	449	32,882			
	D. Special Current Transfers						
2	Support to others	-	2	2			
7	Provisions other than deprec.	3,693	1,110	4,803			
8	Property taxes	1	5	6			
9	Other allocations	579	19	599			
	Subtotal, Special Current Trans.	4,273	1,136	5,410			
	Total Sub II	38,099	2,121	40,221			
	Total Sub I & II	73,008	8,309	81,317			

(a) Difference between the 13% charged to PBDAC by commercial banks and the 4.5% (per season) interest it charges the farmer

(b) 1% on loan amount, charged when credit is issued

(c) Difference between rate PBDAC borrows at commercial banks (e.g. 13%) and rate it lends to producers (e.g. 4.5%), reimbursed by GOK.

(d) Subtracted to eliminate double counting.

* GOK public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

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TABLE D-4 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
INVESTMENT CREDITS 1986 (IN LE '000)

EXPENSES					INCOME		
Arti-cles*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Interest and penalties	69,826	
1	Salaries (permanent employees)	6,179	1,521	7,700	Fees for feas. studies & site inspection	1,288	
2	Contract employees	37	14	51	Subsidy	20,149	
5	Bonuses & incentives	9,255	1,960	11,215	Commissions and bonuses	63,398	
5	Additional pension funds	821	221	1,042			
5	Legal pension funds	77	55	132	Total income		154,661
5	New pension funds	145	55	200	Principal Bank's part (a)		(5,472)
6	Position and expense allowances	3,390	863	4,253			
7	In-kind benefits	162	78	241	Total inc. net of principal Bank's part		149,189
8	Cash benefits	2,976	751	3,727			
	Balance preparation incentives	518	197	715	Income net of expenses		41,125
	Insurance	131	28	159			
	Total Bab I	23,692	5,743	29,435			
					(a) Subtracted to eliminate double counting.		
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials						
2	Fuel & lubricants	12	25	37			
3	Spare parts & supplies	23	36	59			
4	Packaging	-	1	1			
5	Books and stationery	35	24	59			
6	Water, electricity, gas	19	17	35			
	Subtotal, Goods	89	103	191			
	B. Services						
1	Maintenance	45	37	83			
3	Services, research + exp.	1	-	1			
4	Advertisement & representation	24	26	50			
5	Printing	211	75	286			
6	Transport & communications	245	139	384			
7	Rent of machinery & vehicles	4	3	7			
8	Services by public companies	24	32	57			
9	Taxes & fees	1	3	3			
12	Training	21	2	23			
11	Diverse services	165	109	273			
14	Services to non-employees	31	13	44			
	Subtotal, Services	772	439	1,211			
	C. Current Transfers						
1	Taxes & fees on commodities	27	19	46			
2	Depreciation	239	157	396			
3	Rent	150	37	187			
4	Interest & financing expenses	59,852	3,409	63,261			
6	Interest on bonds	5	2	7			
10	Other transfer payments	21	-	22			
	Subtotal, Current Transfers	60,294	3,624	63,919			
	D. Special Current Transfers						
2	Support to others	-	1	1			
7	Provisions other than deprec.	11,027	504	11,530			
8	Property taxes	12	4	15			
9	Other allocations	70	56	126			
	Bad debts provision	1,535	-	1,535			
	Commercial & brokerage exp.	94	7	101			
	Subtotal, Special Current Trans.	12,738	572	13,308			
	Total Bab II	73,890	4,739	78,629			
	Total Bab I & II	97,582	10,482	108,064			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

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TABLE D-5 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
INVESTMENT CREDITS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission & interest	183,550	
1	Salaries (permanent employees)	8,130	2,554	10,684	Adm. expenses (a)	12,240	
2	Contract employees	40	14	55	Late payment penalties	5,624	
5	Bonuses & incentives	13,035	3,569	16,604	Subsidy	20,439	
5	Additional pension funds	629	283	912			
5	Legal pension funds	16	14	30	Total before discount		221,854
5	New pension funds	196	34	230	PBDAC's distribution commission (b)		9,261
6	Position and expense allowances	4,641	1,578	6,219			
7	In-kind benefits	257	114	371	Total income of activity		212,593
8	Cash benefits	6,402	2,828	9,230			
					Income net of expenses		40,090
	Total Bab I	33,346	10,988	44,334			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	14	42	56			
3	Spare parts & supplies	25	43	69			
5	Books and stationery	29	51	80			
6	Water, electricity, gas	19	27	46			
	Subtotal, Goods	87	163	251			
	B. Services						
1	Maintenance	57	58	116			
4	Advertisement & representation	17	24	41			
5	Printing	264	182	446			
6	Transport & communications	320	251	571			
7	Rent of machinery & vehicles	2	3	5			
8	Services by public companies	31	47	78			
9	Taxes & fees	4	13	17			
12	Training	3	41	43			
11	Diverse services	245	198	443			
14	Services to non-employees	95	38	133			
	Subtotal, Services	1,038	855	1,893			
	C. Current Transfers						
1	Taxes & fees on commodities	28	38	66			
2	Depreciation	361	403	763			
3	Rent	216	56	272			
4	Interest & financing expenses	83,237	8,786	92,022			
6	Interest on bonds	-	11	11			
10	Other transfer payments	7,987	-	7,987			
	Subtotal, Current transfers	91,829	9,294	101,121			
	D. Special Current Transfers						
1	Contributions	8	-	8			
2	Support to others	-	4	4			
6	Bad debts provision	1,376	-	1,376			
7	Provisions other than deprec.	21,593	1,724	23,317			
8	Property taxes	11	6	17			
9	Other allocations	32	48	80			
	Commercial & brokerage exp.	64	39	102			
	Subtotal, Special Current Trans.	23,084	1,821	24,904			
	Total Bab II	116,038	12,133	128,169			
	Total Bab I & II	149,382	23,121	172,503			

(a) 1% on aerial spraying of cotton.

(b) PBDAC's part is 5% of total commission (subtracted to eliminate double counting).

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-6 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
INVESTMENT CREDITS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission (a)	197,277	
1	Salaries (permanent employees)	8,515	2,134	10,649	Investment credit costs	9,272	
2	Contract employees	68	12	80	Interest (a)	92,003	
5	Bonuses	16,006	3,441	19,447	Late payment penalties	8,695	
5	Additional pension funds	721	236	958	Interest subsidy (b)	19,274	
5	Legal pension funds	54	15	69	Adm. costs (c)	5,802	
5	New pension funds	249	99	347	Fees for supervision	2,227	
6	Position and expense allowances	4,711	1,470	6,180	Diverse receipts	168	
7	In-kind benefits	733	211	945	Income of PBDAC branches	3,257	
8	Cash benefits	6,061	1,353	7,413			
					Total income of activity		237,975
	Total Bab I	37,117	8,971	46,088			
					Income net of expenses		43,173
	Bab II (Goods & Services)						
	A. Goods				(a) Different names for interest income		
2	Fuel & lubricants	14	40	55			
3	Spare parts & supplies	29	45	74	(b) For food security projects (poultry etc.)		
4	Packaging	1	-	1			
5	Books and stationery	43	42	85	(c) 1% of loan, discounted when loan is issued		
6	Water, electricity, gas	37	37	74			
	Subtotal, Goods	124	165	238			
	B. Services						
1	Maintenance	127	68	195			
4	Advertisement & representation	60	31	91			
5	Printing	325	142	467			
6	Transport & communications	276	198	474			
7	Rent of machinery & vehicles	3	-	3			
8	Services by public companies	31	60	91			
9	Taxes & fees	4	6	11			
12	Training	14	6	21			
11	Diverse services	714	224	938			
14	Services to non-employees	90	31	121			
	Cash allowanges	5	2	6			
	Subtotal, Services	1,649	769	2,418			
	C. Current Transfers						
1	Taxes & fees on commodities	22	43	65			
2	Depreciation	264	383	647			
3	Rent	144	48	192			
4	Interest & financing expenses	107,988	218	108,206			
6	Interest on bonds	-	9	9			
	Subtotal, Current Transfers	108,417	702	109,119			
	D. Special Current Transfers						
2	Support to others	-	4	4			
6	Bad debts provision	1,553	-	1,553			
7	Provisions other than deprec.	32,739	2,391	35,130			
8	Property taxes	2	5	7			
9	Other allocations	133	61	195			
	Subtotal, Special Current Trans.	34,427	2,461	36,888			
	Total Bab II	144,617	4,097	148,713			
	Total Bab I & II	181,734	13,067	194,802			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-7 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
BANKING TRANSACTIONS (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Interest on banking transactions	19,215	
1	Salaries (permanent employees)	1,736	460	2,196	Operations commissions	757	
2	Contract employees	17	5	22			
5	Bonuses	2,471	595	3,065	Total income of activity		19,972
5	Additional pension funds	163	87	250			
5	Legal pension funds	17	34	52	Income net of expenses		3,264
5	New pension funds	70	19	89			
6	Position and expense allowances	1,070	272	1,341			
7	In-kind benefits	60	26	87			
8	Cash benefits	808	209	1,017			
	Schooling and holiday bonuses	7	3	10			
	Cost of living supplement	10	2	11			
	Insurance	160	32	192			
	Additional social support	18	1	19			
	Balance auditing supplement	82	9	91			
	Total Bab I	6,689	1,753	8,442			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	1	2	3			
3	Spare parts & supplies	6	3	9			
5	Books and stationery	6	2	8			
6	Water, electricity, gas	5	3	9			
	Subtotal, Goods	18	10	29			
	B. Services						
1	Maintenance	19	10	29			
4	Advertisement & representation	6	3	8			
5	Printing	62	12	74			
6	Transport & communications	97	38	135			
8	Services by public companies	3	3	7			
12	Training	3	-	3			
11	Diverse services	37	21	58			
14	Services to non-employees	4	2	6			
	Cash allowances	3	1	4			
	Subtotal, Services	234	90	324			
	C. Current Transfers						
1	Taxes & fees on commodities	18	3	21			
2	Depreciation	13	32	45			
3	Rent	18	5	23			
4	Interest & financing expenses	7,513	150	7,664			
6	Interest on bonds	5	2	7			
	Subtotal, Current Transfers	7,567	192	7,760			
	D. Special Current Transfers						
2	Support to others	-	2	2			
7	Provisions other than deprec.	2	132	134			
8	Property taxes	1	-	1			
9	Other allocations	9	4	13			
	Commercial & brokerage expen.	1	-	1			
	Subtotal, Special Current Trans.	13	138	151			
	Total Bab II	7,834	432	8,266			
	Total Bab I & II	14,523	2,186	16,708			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-8 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
BANKING TRANSACTIONS (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission	21,846	
1	Salaries (permanent employees)	1,704	467	2,171			
2	Contract employees	15	7	22	Total income of activity		21,846
5	Bonuses & incentives	2,635	805	3,440	Islamic allocations		85
5	Additional pension funds	138	48	186			
5	Legal pension funds	4	1	5	Total income		21,931
5	New pension funds	56	6	61	Income net of expenses		5,807
6	Position and expense allowances	943	274	1,216			
7	In-kind benefits	109	18	127			
8	Cash benefits	864	238	1,102			
	Balance auditing supplement	173	71	243			
	Total Bab I	6,641	1,935	8,576			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	2	4	6			
3	Spare parts & supplies	7	6	13			
5	Books and stationery	4	5	8			
6	Water, electricity, gas	5	5	9			
	Subtotal, Goods	18	20	36			
	B. Services						
1	Maintenance	16	9	24			
4	Advertisement & representation	11	7	18			
5	Printing	49	15	64			
6	Transport & communications	88	32	120			
8	Services by public companies	4	6	10			
9	Taxes & fees	2	2	4			
12	Training	-	5	5			
11	Diverse services	46	37	83			
14	Services to non-employees	11	3	13			
	Subtotal, Services	227	116	341			
	C. Current Transfers						
1	Taxes & fees on commodities	32	3	35			
2	Depreciation	56	55	111			
3	Rent	12	2	14			
4	Interest & financing expenses	6,534	18	6,652			
6	Interest on bonds	-	8	8			
	Subtotal, Current Transfers	6,734	86	6,820			
	D. Special Current Transfers						
7	Provisions other than deprec.	55	216	270			
8	Property taxes	3	3	6			
9	Other allocations	18	3	21			
	Islamic associations	45	-	45			
	Commercial & brokerage expen.	1	1	2			
	Subtotal, Special Current Trans.	122	223	344			
	Total Bab II	7,100	445	7,545			
	Total Bab I & II	13,741	2,380	16,125			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-9 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
BANKING TRANSACTIONS (IN LE '000)

EXPENSES					INCOME		
Arti-cles*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Interest on banking transactions	16,209	
1	Salaries (permanent employees)	2,127	425	2,552	1/2 of commission on credit documents	512	
2	Contract employees	20	4	24	Income of foreign operations	784	
5	Bonuses	3,704	717	4,421	Banking commissions	9,732	
5	Additional pension funds	244	65	309		---	
5	Legal pension funds	14	6	20	Total income of activity		27,238
6	Position and expense allowances	1,193	269	1,462			
7	In-kind benefits	81	20	101	Income net of expenses		8,986
8	Cash benefits & insurance	1,565	289	1,854			
	Merit increase 20%	22	7	29			
	Total Bab I	8,970	1,801	10,771			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	3	5	8			
3	Spare parts & supplies	7	8	15			
5	Books and stationery	6	5	11			
6	Water, electricity, gas	11	6	17			
	Subtotal, Goods	27	24	51			
	B. Services						
1	Maintenance	35	18	53			
4	Advertisement & representation	26	2	28			
5	Printing	56	17	73			
6	Transport & communications	111	23	134			
7	Rent of machinery & vehicles	4	-	5			
8	Services by public companies	2	11	13			
9	Taxes & fees	2	4	6			
12	Training	10	1	11			
11	Diverse services	90	26	116			
14	Services to non-employees	15	4	19			
	Subtotal, Services	351	106	458			
	C. Current Transfers						
1	Taxes & fees on commodities	27	6	34			
2	Depreciation	56	39	94			
3	Rent	31	4	36			
4	Interest & financing expenses	5,059	146	5,205			
6	Interest on bonds	-	6	6			
	Subtotal, Current Transfers	5,173	201	5,375			
	D. Special Current Transfers						
1	Contributions	13	2	15			
7	Provisions other than deprec.	1,157	388	1,545			
8	Property taxes	17	-	18			
9	Other allocations	15	8	23			
	Subtotal, Special Current Trans.	1,202	398	1,601			
	Total Bab II	6,153	727	7,480			
	Total Bab I & II	15,723	2,528	18,251			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-10 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
FERTILIZERS (IN LE '000)

EXPENSES

Articles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.
	Bab I (Personnel)			
1	Salaries (permanent employees)	4,627	1,214	5,841
2	Contract employees	405	94	499
5	Bonuses	7,251	1,843	9,094
5	Additional pension funds	423	220	642
5	Legal pension funds	40	36	76
5	New pension funds	221	46	267
6	Position and expense allowances	2,588	690	3,278
7	In-kind benefits	125	62	187
8	Cash benefits	2,652	716	3,368
	Cost of living supplement	77	14	91
	Total Bab I	18,409	4,935	23,344
	Bab II (Goods & Services)			
	A. Goods			
2	Fuel & lubricants	11	17	28
3	Spare parts & supplies	28	31	60
4	Packaging	394	21	415
5	Books and stationery	17	18	35
6	Water, electricity, gas	16	11	27
	Subtotal, Goods	466	98	565
	B. Services			
1	Maintenance	93	23	116
3	Services, research + experim.	1	-	1
4	Advertisement & representation	6	13	19
5	Printing	157	117	274
6	Transport & communications	2,348	171	2,520
7	Rent of machinery & vehicles	2	2	4
8	Services by public companies	16	23	39
9	Taxes & fees	-	-	1
12	Training	25	16	42
11	Diverse services	227	100	327
14	Services to non-employees	5	11	16
	Subtotal, Services	2,880	476	3,359
	C. Current Transfers			
1	Taxes & fees on commodities	32	18	50
2	Depreciation	737	268	1,005
3	Rent	358	61	419
4	Interest & financing expenses	3,430	589	4,019
6	Interest on bonds	5	2	7
	Subtotal, Current Transfers	4,562	938	5,500
	D. Special Current Transfers			
2	Support to others	-	1	1
7	Provisions other than deprec.	110	240	350
8	Property taxes	5	3	8
	Commercial & brokerage expen.	66	6	71
	Subtotal, Special Current Trans.	181	250	430
	Total Bab II	8,090	1,765	9,854
	Total Bab I & II	26,499	6,699	33,198

INCOME

ITEM	Partial	Total
Diverse	21	
Distribution commission	41,717	
Rounding up (a)	52	
Discount (b)	10,998	
Transport of fertilizers	1,011	
Total income of activity		53,799
Principal Bank's part (c)		278
Total net income of activity		53,522
Income net of expenses		20,324

(a) Costs quoted in millims paid by farmers in nearest higher shilling.

(b) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to co-ops.

(c) Subtracted to eliminate double counting.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-11 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
FERTILIZERS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Transport & price differentials (a)	327	
1	Salaries (permanent employees)	5,036	813	5,848	Commission & interest	46,100	
2	Contract employees	856	80	936	Discount (b)	8,207	
5	Bonuses & incentives	6,980	1,411	8,391			
5	Additional pension funds	365	75	440	Total income of activity		54,634
5	Legal pension funds	11	4	15			
5	New pension funds	154	30	184	Income net of expenses		20,850
6	Position and expense allowances	2,772	520	3,291			
7	In-kind benefits	160	37	196	(a) Transport prices paid by NOA less actual costs.		
8	Cash benefits	2,369	416	2,785			
					(b) In the case of sale to individuals, PBDAC takes the 5%		
	Total Bab I	18,703	3,385	22,088	discount which is given on sales to cooperatives.		
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	8	17	25			
3	Spare parts & supplies	34	24	58			
4	Packaging	140	-	140			
5	Books and stationery	22	17	39			
6	Water, electricity, gas	14	12	26			
	Subtotal, Goods	218	70	288			
	B. Services						
1	Maintenance	105	24	129			
4	Advertisement & representation	10	10	20			
5	Printing	130	118	248			
6	Transport & communications	2,527	92	2,619			
7	Rent of machinery & vehicles	1	2	2			
8	Services by public companies	15	22	38			
9	Taxes & fees	2	1	4			
12	Training	-	12	13			
11	Diverse services	252	55	307			
14	Services to non-employees	63	61	124			
	Subtotal, Services	3,105	397	3,504			
	C. Current Transfers						
1	Taxes & fees on commodities	28	11	39			
2	Depreciation	851	125	976			
3	Rent	365	13	378			
4	Interest & financing expenses	5,299	234	5,532			
6	Interest on bonds	-	6	6			
	Subtotal, Current Transfers	6,543	389	6,931			
	D. Special Current Transfers						
2	Support to others	-	2	2			
7	Provisions other than deprec.	466	421	887			
8	Property taxes	10	3	12			
9	Other allocations	35	37	71			
	Subtotal, Special Current Trans.	511	463	972			
	Total Bab II	10,375	.,321	11,696			
	Total Bab I & II	29,078	4,706	33,784			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-12 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
FERTILIZERS (IN LE '000)

EXPENSES

Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.
	Bab I (Personnel)			
1	Salaries (permanent employees)	5,423	800	6,223
5	Bonuses	9,560	1,478	11,038
5	Additional pension funds	416	108	524
5	Legal pension funds	21	200	221
6	Position and expense allowances	2,967	525	3,493
7	In-kind benefits	155	38	193
8	Cash benefits	3,943	557	4,501
	Old Pension funds	131	24	155
	Total Bab I	22,617	3,730	26,347
	Bab II (Goods & Services)			
	A. Goods			
2	Fuel & lubricants	7	24	31
3	Spare parts & supplies	40	34	74
4	Packaging	94	-	94
5	Books and stationery	17	20	36
6	Water, electricity, gas	26	18	44
	Subtotal, Goods	184	96	279
	B. Services			
1	Maintenance	135	108	243
4	Advertisement & representation	29	14	43
5	Printing	175	72	247
6	Transport & communications	2,713	88	2,801
7	Rent of machinery & vehicles	1	1	2
8	Services by public companies	19	35	54
9	Taxes & fees	55	69	124
11	Diverse services	227	103	330
14	Services to non-employees	19	9	28
	Subtotal, Services	3,372	498	3,870
	C Current Transfers			
1	Taxes & fees on commodities	48	17	65
2	Depreciation	1,125	207	1,332
3	Rent	471	17	488
4	Interest & financing expenses	6,587	208	6,795
6	Interest on bonds	-	8	8
	Subtotal, Current Transfers	8,231	457	8,668
	D. Special Current Transfers			
2	Support to others	-	3	3
6	Bad debts provision	-	22	22
7	Provisions other than deprec.	198	421	619
8	Property taxes	5	2	7
9	Other allocations	44	10	54
	Subtotal, Special Current Trans.	247	458	705
	Total Bab II	12,034	1,508	13,542
	Total Bab I & II	34,650	5,238	39,889

INCOME

ITEM	Partial	Total
Commission (a)	47,019	
Sale of new bags (b)	980	
Rounding up (c)	924	
Distribution commission	2,045	
Co-op discount (d)	11,224	
Adm. expenses (e)	1	
Total income of activity		62,194
Principal Bank's part (f)		270
Total net income of activity		61,924
Income net of expenses		22,035

(a) Total PBDAC commission of 16.5% on fertilizer sales

(b) Payment by farmers for re-bagging damaged fertilizer bags

(c) Costs quoted in millins paid by farmers in nearest higher shilling

(d) The 5% discount offered to co-ops as a commission is credited by the bank to itself when it distributes to farmers directly

(e) Fines on storekeepers for missing fertilizer (official price plus 10% on double the price)

(f) Of the total commission, 5% is credited to the Principal Bank. This is subtracted here to eliminate double counting.

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-13 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
SEEDS

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Distribution commission	1,549	
1	Salaries (permanent employees)	657	142	799	Financing of interest (b)	2,406	
2	Contract employees	7	1	8	Commission on distrib. seeds to BDACs	11	
5	Bonuses	870	195	1,065	Rounding up (a)	18	
5	Additional pension funds	54	21	75	Discount (b)	7	
5	Legal pension funds	16	9	25	Storage costs (c)	10	
5	New pension funds	32	8	40	Distribution of maize seeds	117	
6	Position and expense allowances	407	81	487	Bonuses	113	
7	In-kind benefits	28	8	36		------	4,231
8	Cash benefits	288	52	340			
	Insurance	63	11	74	Income	654	
					Fines	4	
	Total Bab 1	2,422	529	2,950	Commission 10 % on distrib. outside of governorate	11	
	Bab II (Goods & Services)				Part of the exporting bank in the 10 % commission	103	
	A. Goods						
1	Raw materials	1	-	1	Indemnification for missing funds	1	
2	Fuel & lubricants	-	1	2		------	
3	Spare parts & supplies	3	1	4	Total income of activity		5,005
5	Books and stationery	2	-	3	Part of PBDAC and BDACs (d)		2,102
6	Water, electricity, gas	3	1	4			------
		------	------	------	Total net income		2,903
	Subtotal, Goods	8	3	13	Income net of expenses		(790)
	B. Services						
1	Maintenance	14	3	17			
4	Advertisement & representation	1	1	2			
5	Printing	13	5	18			
6	Transport & communications	28	12	40			
8	Services by public companies	3	2	5			
11	Diverse services	15	9	24			
14	Services to non-employees	-	1	1			
		------	------	------			
	Subtotal, Services	74	33	107			
	C. Current Transfers						
1	Taxes & fees on commodities	3	1	4			
2	Depreciation	40	12	52			
3	Rent	30	1	32			
4	Interest & financing expenses	424	53	477			
6	Interest on bonds	3	-	3			
		------	------	------			
	Subtotal, Current Transfers	500	67	568			
	D. Special Current Transfers						
7	Other replacement provisions	8	34	44			
8	Property taxes	1	1	1			
9	Other allocations	4	-	4			
	Commercial & brokerage expen.	2	-	2			
		------	------	------			
	Subtotal, Special Current Trans.	15	35	51			
	Total Bab II	599	143	743			
	Total Bab I & II	3,021	672	3,693			

(a) Costs quoted in millins paid by farmers in nearest higher shilling.

(b) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOK authorities.

(c) Storage costs covered by the NOA trading account.

(d) Subtracted to eliminate double counting.

* GOK public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-14 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
SEEDS (IN LE '000)

EXPENSES

Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.
	Bab I (Personnel)			
1	Salaries (permanent employees)	646	111	756
2	Contract employees	7	2	9
5	Bonuses & incentives	1,009	219	1,229
5	Old pension funds	1	2	3
5	Additional pension funds	59	10	69
5	Legal pension funds	2	1	3
5	New pension funds	28	4	33
6	Position and expense allowances	353	72	425
7	In-kind benefits	35	6	40
8	Cash benefits	316	61	377
	Total Bab 1	1,663	334	1,997
	Bab II (Goods & Services)			
	A. Goods			
1	Raw materials	2	-	2
2	Fuel & lubricants	1	2	2
3	Spare parts & supplies	6	2	8
4	Packaging	1	-	1
5	Books and stationery	1	1	3
6	Water, electricity, gas	2	2	4
	Subtotal, Goods	13	7	20
	B. Services			
1	Maintenance	22	3	25
4	Advertisement & representation	1	2	3
5	Printing	15	5	20
6	Transport & communications	34	9	43
8	Services by public companies	2	2	4
9	Taxes & fees	1	-	2
12	Training	-	2	2
11	Diverse services	11	11	22
14	Services to non-employees	5	2	6
	Subtotal, Services	90	36	126
	C. Current Transfers			
1	Taxes & fees on commodities	4	1	4
2	Depreciation	46	17	62
3	Rent	22	1	23
4	Interest & financing expenses	596	21	616
6	Interest on bonds	-	2	2
	Subtotal, Current Transfers	667	42	709
	D. Special Current Transfers			
2	Support to others	-	1	1
7	Provisions other than deprec.	3	49	52
8	Property taxes	1	1	2
9	Other allocations	2	4	6
	Subtotal, Special Current Trans.	9	55	61
	Total Bab II	777	139	916
	Total Bab I & II	2,440	473	2,913

INCOME

ITEM	Partial	Total
Commissions	3,743	
Rounding-up (a)	142	
Cairo Branch	1	
Alexandria Branch	36	
New Vally Branch	5	
Total income of activity		3,927
Income net of expenses		67

(a) Costs quoted in millims paid by farmers in nearest higher shilling.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-15 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
SEEDS (IN LE '000)

EXPENSES					INCOME		
Arti-cle[a]	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission & financing interest	3,161	
1	Salaries (permanent employees)	705	123	827	Diverse income	898	
2	Contract employees	8	1	9	Bonuses to the fund	46	
5	Bonuses & incentives	1,231	224	1,455	Part of PBDAC in commission & interest	304	
5	Additional pension funds	21	8	29	Storge fees	41	
5	Legal pension funds	5	1	6	Rounding up (a)	25	
5	Non pension funds	73	11	84	Distribution seed bonuses	34	
6	Position and expense allowances	373	70	443	Income & commission of PBDAC	549	
7	In-kind benefits	35	6	41	Income of branches	80	
8	Cash benefits	476	70	546			
	Insurance	46	12	58	Total income of activity		5,138
	Total Bab I	2,973	526	3,499	Income net of expenses		284
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	-	2	2			
2	Fuel & lubricants	1	2	3			
3	Spare parts & supplies	7	3	10			
4	Packaging	2	-	2			
5	Books and stationery	2	1	4			
6	Water, electricity, gas	4	3	7			
	Subtotal, Goods	16	11	28			
	B. Services						
1	Maintenance	23	8	31			
4	Advertisement & representation	3	1	4			
5	Printing	21	6	27			
5	Transport & communications	33	8	41			
8	Services by public companies	-	4	4			
9	Taxes & fees	-	2	2			
11	Diverse services	25	12	37			
14	Services to non-employees	1	2	3			
	Subtotal, Services	106	43	149			
	C. Current Transfers						
1	Taxes & fees on commodities	4	2	6			
2	Depreciation	64	17	81			
3	Rent	56	2	58			
4	Interest & financing expenses	855	62	917			
	Subtotal, Current Transfers	979	83	1,062			
	D. Special Current Transfers						
7	Provisions other than deprec.	46	58	104			
9	Other allocations	4	5	9			
	Commercial & brokerage expenses	-	-	1			
	Subtotal, Special Current Trans.	50	63	113			
	Total Bab II	1,154	201	1,355			
	Total Bab I & II	4,127	727	4,854			

(a) Costs quoted in millims paid by farmers in nearest higher shilling.

a GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-16 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
PESTICIDES (IN LE '000)

EXPENSES

Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.
	Bab I (Personnel)			
1	Salaries (permanent employees)	1,753	368	2,121
2	Contract employees	15	3	18
5	Bonuses	2,678	535	3,214
5	Additional pension funds	303	88	391
5	Legal pension funds	23	20	43
6	Position and expense allowances	1,073	210	1,283
7	In-kind benefits	74	20	94
8	Cash benefits	1,030	188	1,217
	Total Bab I	6,950	1,431	8,381
	Bab II (Goods & Services)			
	A. Goods			
2	Fuel & lubricants	5	3	8
3	Spare parts & supplies	10	4	14
5	Books and stationery	6	2	8
6	Water, electricity, gas	7	2	9
	Subtotal, Goods	28	12	40
	B. Services			
1	Maintenance	23	5	29
4	Advertisement & representation	3	3	6
5	Printing	65	13	78
6	Transport & communications	97	24	121
8	Services by public companies	5	5	10
11	Diverse services	108	21	129
14	Services to non-employees	2	2	4
	Subtotal, Services	304	74	378
	C. Current Transfers			
1	Taxes & fees on commodities	8	3	11
2	Depreciation	103	30	133
3	Rent	135	3	138
4	Interest & financing expenses	2,159	136	2,295
6	Interest on bonds	5	1	6
	Subtotal, Current Transfers	2,410	173	2,583
	D. Special Current Transfers			
7	Provisions other than deprec.	42	68	110
8	Property taxes	1	1	2
9	Other allocations	19	2	21
	Subtotal, Special Current Trans.	62	72	134
	Total Bab II	2,804	330	3,134
	Total Bab I & II	9,754	1,762	11,516

INCOME

ITEM	Partial	Total
Commission on pesticide distributions	12,680	
Commission on other distribution	13	
Financing interest on balances due	964	
Rounding up (a)	20	
Pesticide bonuses	88	
Commission	222	
Discount (b)	2,214	
Pesticide trading by principal Bank	12	
Diverse	5	
Profit on pesticide transport (c)	48	
Commission on foliar fertilizers	19	
Total income of activity		16,285
Income net of expenses		4,769

(a) Costs quoted in millims paid by farmers in nearest higher shilling.

(b) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

(c) Pre-established transport fees paid by MOA less actual expenses.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-17 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
PESTICIDES (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Diverse	33	
1	Salaries (permanent employees)	1,729	355	2,084	PBDAC's distribution commission (a)	619	
2	Contract employees	19	4	23	Distribution bonus (b)	26	
5	Bonuses	2,572	686	3,258	Profits on transactions	96	
5	Additional pension funds	226	50	276	Distribution commission	13,628	
5	Legal pension funds	5	1	6	Discount (c)	2,461	
6	Position and expense allowances	1,018	217	1,236	Rounding up (d)	36	
7	In-kind benefits	99	15	114	Financing of interest (e)	1,890	
8	Cash benefits	880	179	1,059			
					Total income of activity		18,789
	Total Bab I	6,549	1,507	8,055			
					Income net of expenses		6,682
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	3	4	6			
3	Spare parts & supplies	10	4	15			
5	Books and stationery	5	3	8			
6	Water, electricity, gas	6	3	9			
	Subtotal, Goods	24	14	38			
	B. Services						
1	Maintenance	31	6	37			
4	Advertisement & representation	3	4	7			
5	Printing	77	13	90			
6	Transport & communications	76	22	98			
8	Services by public companies	5	5	10			
9	Taxes & fees	2	-	2			
12	Training	-	4	4			
11	Diverse services	96	25	121			
14	Services to non-employees	7	3	10			
	Subtotal, Services	297	82	379			
	C. Current Transfers						
1	Taxes & fees on commodities	7	2	9			
2	Depreciation	126	37	162			
3	Rent	140	3	143			
4	Interest & financing expenses	2,934	99	3,033			
6	Interest on bonds	-	5	5			
	Subtotal, Current Transfers	3,207	146	3,352			
	D. Special Current Transfers						
2	Support to others	-	2	2			
7	Provisions other than deprec.	151	106	257			
8	Property taxes	5	2	6			
9	Other allocations	8	6	15			
	Subtotal, Special Current Trans.	164	116	280			
	Total Bab II	3,692	360	4,052			
	Total Bab I & II	10,240	1,867	12,107			

(a) PBDAC's part is 5% of total commission.

(b) Percentage received from MOA on purchase of certain locally-manufactured pecticides.

(c) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

(d) Costs quoted in millins paid by farmers in nearest higher shilling.

(e) Received from MOA for interest costs of storing pesticides over one year.

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-18 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
PESTICIDES (IN LE '000)

EXPENSES					INCOME		
Article	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				PBDAC's distrib. commission (a)	15,651	
1	Salaries (permanent employees)	1,979	332	2,311	PBDAC's distrib. commission (b)	30	
2	Contract employees	22	3	25	Financing of interest (c)	2,822	
5	Bonuses	3,451	599	4,050	Rounding up (d)	113	
5	Additional pension funds	237	68	306	Discount (e)	2,636	
5	Legal pension funds	11	3	14	Aerial spraying (f)	30	
6	Position and expense allowances	1,091	220	1,311	Storage expenses (g)	131	
7	In-kind benefits	90	18	108	Transport profits (h)	12	
8	Cash benefits	1,453	235	1,688	Distribution bonus (i)	2	
					Adm. expenses (j)	157	
	Total Bab I	8,335	1,477	9,812	Diverse	6	

	Bab II (Goods & Services)						
	A. Goods				Total income of activity		21,590
2	Fuel & lubricants	2	5	8			
3	Spare parts & supplies	13	9	21	Income net of expenses		5,602
5	Books and stationery	5	4	9			
6	Water, electricity, gas	10	6	16			
	Subtotal, Goods	30	24	54			
	B. Services						
1	Maintenance	46	24	69			
4	Advertisement & representation	16	3	19			
5	Printing	62	15	77			
6	Transport & communications	104	23	127			
8	Services by public companies	4	11	14			
9	Taxes & fees	16	8	24			
12	Training	1	1	2			
11	Diverse services	89	26	115			
14	Services to non-employees	5	3	7			
	Subtotal, Services	342	113	456			
	C. Current Transfers						
1	Taxes & fees on commodities	10	5	15			
2	Depreciation	173	44	218			
3	Rent	159	4	163			
4	Interest & financing expenses	4,656	166	4,822			
6	Interest on bonds	-	6	6			
	Subtotal, Current Transfers	4,998	226	5,225			
	D. Special Current Transfers						
2	Support to others	1	-	1			
7	Provisions other than deprec.	52	47	99			
9	Other allocations	9	7	16			
	Subtotal, Special Current Trans.	272	167	441			
	Total Bab II	5,643	533	6,176			
	Total Bab I & II	13,978	2,010	15,988			

(a) Total distribution commission is 15% of sales.

(b) PBDAC's part is 5% of total commision.

(c) Received from MOA for intrest costs of storing pesticides over one year.

(d) Costs quoted in millis paid by farmers in nearest higher shilling.

(e) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

(f) Interest receipts from MOA on financing aerial spraying.

(h) Excess of fixed transport costs received from MOA over actual expenditures.

(i) Percentage received from MOA on purchas of certain locally-manufactured pesticides.

(j) 1% on aerial spraying of cotton.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-19 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
FEED (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Distribution commission	2,755	
1	Salaries (permanent employees)	932	224	1,156	Financing of interest	5,321	
2	Contract employees	5	1	6	Discount (a)	720	
5	Bonuses	1,207	330	1,537	Transport and price differentials (b)	1,218	
5	Additional pension funds	74	40	115	Rounding up (c)	12	
5	Legal pension funds	10	11	21			------
5	New pension funds	57	10	67	Total income of activity		10,026
6	Position and expense allowances	478	123	601			
7	In-kind benefits	29	13	42	Income net of expenses		5,153
8	Cash benefits	489	109	598			
	Total Bab I	3,281	862	4,143			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	1	1	2			
3	Spare parts & supplies	7	1	8			
5	Books and stationery	3	1	4			
6	Water, electricity, gas	3	1	4			
	Subtotal, Goods	14	4	18			
	B. Services						
1	Maintenance	18	3	21			
4	Advertisement & representation	8	1	9			
5	Printing	14	4	18			
6	Transport & communications	59	14	73			
8	Services by public companies	3	2	5			
12	Training	1	-	1			
11	Diverse services	24	9	32			
14	Services to non-employees	1	1	2			
	Subtotal, Services	128	34	161			
	C. Current Transfers						
1	Taxes & fees on commodities	6	1	8			
2	Depreciation	78	13	91			
3	Rent	20	2	22			
4	Interest & financing expenses	284	54	338			
6	Interest on bonds	3	1	3			
	Subtotal, Current Transfers	392	70	462			
	D. Special Current Transfers						
7	Provisions other than deprec.	38	44	82			
8	Property taxes	-	-	1			
9	Other allocations	4	1	5			
	Subtotal, Special Current Trans.	42	46	88			
	Total Bab II	575	155	730			
	Total Bab I & II	3,857	1,016	4,873			

(a) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

(b) Pre-established transport prices paid by MOA less actual costs.

(c) Costs quoted in millims paid by farmers in nearest higher shilling .

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-20 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
FEED (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission	7,384	
1	Salaries (permanent employees)	1,012	203	1,215	Profit	2,013	
2	Contract employees	8	2	10	Discount (a)	577	
5	Bonuses	1,496	408	1,904	Interest	46	
5	Additional pension funds	99	19	118	Surpluses	11	
5	Legal pension funds	3	1	4	Rounding up (b)	922	
5	New pension funds	46	6	53	Income of branches	543	
6	Position and expense allowances	570	124	694			
7	In-kind benefits	49	9	58	Total income of activity		11,497
8	Cash benefits	490	103	594			
					Income net of expenses		5,627
	Total Bab I	3,773	876	4,650			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	-	1	1			
2	Fuel & lubricants	4	2	6			
3	Spare parts & supplies	9	1	10			
4	Packaging	3	-	3			
5	Books and stationery	4	2	6			
6	Water, electricity, gas	1	1	2			
	Subtotal, Goods	21	7	28			
	B. Services						
1	Maintenance	30	3	34			
4	Advertisement & representation	6	2	8			
5	Printing	35	5	40			
6	Transport & communications	68	11	78			
8	Services by public companies	2	3	6			
9	Taxes & fees	1	1	2			
12	Training	-	2	2			
11	Diverse services	20	13	33			
14	Services to non-employees	7	2	9			
	Subtotal, Services	169	42	211			
	C. Current Transfers						
1	Taxes & fees on commodities	7	1	8			
2	Depreciation	137	21	158			
3	Rent	25	1	27			
4	Interest & financing expenses	621	11	632			
6	Interest on bonds	-	3	3			
	Subtotal, Current Transfers	791	37	829			
	D. Special Current Transfers						
2	Support to others	-	1	1			
7	Provisions other than deprec.	76	67	143			
8	Property taxes	2	1	3			
9	Other allocations	5	2	6			
	Subtotal,Special Current Trans.	83	71	154			
	Total Bab II	1,064	157	1,222			
	Total Bab I & II	4,837	1,033	5,870			

(a) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

(b) Costs quoted in millims paid by farmer in nearest higher shilling.

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-21 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
FEED (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commissions	12,561	
1	Salaries (permanent employees)	1,061	158	1,213	Discount (a)	593	
2	Production bonuses	272	96	368			
5	Bonuses	1,386	169	1,555	Total income of activity		13,154
5	Additional pension funds	126	31	157			
5	Legal pension funds	7	2	8	Income net of expenses		6,704
6	Position and expense allowances	582	102	684			
7	In-kind benefits	43	10	52	(a) Distribution commission of LE 1/tonne earmarked for cooperatives, is taken by the bank if it distributes to the farmers directly.		
8	Cash benefits	892	119	1,011			
	Total Bab I	4,368	687	5,055			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	2	6	7			
3	Spare parts & supplies	8	3	12			
4	Packaging	3	-	3			
5	Books and stationery	3	1	4			
6	Water, electricity, gas	5	3	8			
	Subtotal, Goods	22	13	34			
	B. Services						
1	Maintenance	25	8	32			
4	Advertisement & representation	6	1	7			
5	Printing	17	6	23			
6	Transport & communications	68	11	78			
8	Services by public companies	1	5	6			
9	Taxes & fees	-	1	1			
11	Diverse services	31	11	42			
14	Services to non-employees	5	2	7			
	Subtotal, Services	153	45	196			
	C. Current Transfers						
1	Taxes & fees on commodities	6	2	9			
2	Depreciation	115	16	131			
3	Rent	17	2	19			
4	Interest & financing expenses	725	70	795			
6	Interest on bonds	-	3	3			
	Subtotal, Current transfers	863	93	957			
	D. Special Current Transfers						
7	Provisions other than deprec.	108	87	195			
8	Property taxes	1	1	2			
9	Other allocations	2	4	6			
	Subtotal, Special Current Trans.	111	92	203			
	Total Bab II	1,150	245	1,395			
	Total Bab I & II	5,518	932	6,450			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-22 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
SPARE PARTS & SPRAYERS (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission on spare parts & sprayers (a)	1,325	
1	Salaries (permanent employees)	244	72	315	Financing of interest (b)	1,258	
2	Contract employees	4	1	5	Income from parts for Yugoslav tractors	2	
5	Bonuses	310	79	389	Rounding up & Adm. expenses	5	
5	Additional pension funds	26	16	42			
5	Legal pension funds	7	7	14	Total income of activity		2,590
6	Position and expense allowances	137	36	173			
7	In-kind benefits	10	4	14	Income net of expenses		1,027
8	Cash benefits	129	36	165			
	Total Bab I	867	250	1,117			
	Bab II (Goods & Services)						
	A. Goods						
3	Spare parts & supplies	1	1	1			
5	Books and stationery	1	-	1			
6	Water, electricity, gas	2	1	3			
	Subtotal, Goods	4	2	5			
	B. Services						
1	Maintenance	1	2	2			
4	Advertisement & representation	1	1	2			
5	Printing	2	2	4			
6	Transport & communications	16	8	23			
8	Services by public companies	3	1	3			
12	Training	1	-	1			
11	Diverse services	10	5	15			
14	Services to non-employees	1	-	1			
	Subtotal, Services	35	19	50			
	C. Current Transfers						
1	Taxes & fees on commodities	1	-	2			
2	Depreciation	13	6	19			
3	Rent	4	1	5			
4	Interest & financing expenses	282	46	328			
5	Interest on bonds	3	1	3			
	Subtotal, Current Transfers	303	54	357			
	D. Special Current Transfers						
7	Provisions other than deprec.	2	26	29			
9	Other allocations	-	-	1			
	Commercial & brokerage expen.	1	-	1			
	Subtotal, Special Current Trans.	3	26	31			
	Total Bab II	343	192	446			
	Total Bab I & II	1,211	352	1,563			

(a) 10 % on imported items (financed by BOA); 25 % on locally-produced items (financed by PBDAC).
(b) Received from BOA for spare parts more than two years in inventory.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-23 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
SPARE PARTS & SPRAYERS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commissions & interest	2,965	
1	Salaries (permanent employees)	239	67	305	Rounding up (a)	10	
2	Contract employees	5	1	7			
5	Bonuses & incentives	370	130	500	Total income of activity		2,975
5	Additional pension funds	31	7	38			
5	Legal pension funds	2	-	2	Income net of expenses		1,327
5	New pension funds	4	-	5			
6	Positica and expense allowances	133	38	171	(a) Costs quoted in millins paid by farmers in nearest higher shilling.		
7	In-kind benefits	29	2	32			
8	Cash benefits	108	37	140			
	Additional social support	2	-	2			
	Total Bab I	923	284	1,207			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	-	1	1			
3	Spare parts & supplies	2	1	3			
5	Books and stationery	1	1	1			
6	Water, electricity, gas	2	1	3			
	Subtotal, Goods	5	4	8			
	B. Services						
1	Maintenance	6	2	8			
4	Advertisement & representation	-	2	2			
5	Printing	6	3	9			
6	Transport & communications	23	6	29			
8	Services by public companies	2	1	3			
9	Taxes & fees	1	-	1			
12	Training	-	1	1			
11	Diverse services	6	7	14			
	Subtotal, Services	44	22	67			
	C. Current Transfers						
1	Taxes & fees on commodities	1	-	1			
2	Depreciation	6	11	17			
3	Rent	4	-	5			
4	Interest & financing expenses	275	20	295			
6	Interest on bonds	-	2	2			
	Subtotal, Current Transfers	286	33	320			
	D. Special Current Transfers						
7	Provisions other than deprec.	2	37	39			
8	Property taxes	1	1	2			
	Commercial & brokerage expen.	1	1	1			
	Subtotal, Special Current Trans.	4	39	42			
	Total Bab II	341	99	440			
	Total Bab I & II	1,264	383	1,648			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-24 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
SPARE PARTS & SPPRAYERS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission	1,219	
1	Salaries (permanent employees)	257	37	294	Financing of interest (a)	1,089	
2	Contract employees	7	1	8	Storage costs (b)	3	
5	Bonuses	453	63	517	Rounding up (c)	1	
5	Additional pension funds	40	7	47	Transport (d)	8	
5	Legal pension funds	1	-	2	Income from spare parts in bank's possession	6	
6	Position and expense allowances	145	25	171	Income from spare parts for Yugoslav tractors	10	
7	In-kind benefits	19	3	22	Income (commission) on spare parts & sprayers	801	
8	Cash benefits	185	23	207	Less bank expenses, fees & taxes	(19)	
	Total Bab I	1,107	160	1,267	Total BDACS		3,119
	Bab II (Goods & Services)				Income of branches :		
	A. Goods				Alexandria	1	
2	Fuel & lubricants	-	1	1	Cairo	1	
3	Spare parts & supplies	2	2	4	El Arish	21	
5	Books and stationery	1	1	2			
6	Water, electricity, gas	3	2	4	Total branches		24
	Subtotal, Goods	6	6	11	Total income of activity		3,143
	B. Services				Income net of expenses		1,276
1	Maintenance	11	5	16			
4	Advertisement & representation	3	-	3			
5	Printing	5	3	8			
6	Transport & communications	22	5	27			
8	Services by public companies	-	3	3			
9	Taxes & fees	-	1	2			
11	Diverse services	15	5	20			
14	Services to non-employees	3	-	3			
	Subtotal, Services	59	22	82			
	C. Current Transfers						
1	Taxes & fees on commodities	-	1	1			
2	Depreciation	10	9	18			
3	Rent	5	1	6			
4	Interest & financing expenses	382	49	432			
6	Interest on bonds	-	2	2			
	Subtotal, Current Transfers	397	62	459			
	D. Special Current Transfers						
7	Provisions other than deprec.	3	41	44			
9	Other allocations	-	2	3			
	Subtotal, Special Current Trans.	3	43	47			
	Total Bab II	465	134	599			
	Total Bab I & II	1,573	294	1,867			

(a) Received from MOA for spare parts more than two years in inventory

(b) Charged to customers for merchandise bought but not picked up

(c) Costs denominated in millins, charged to farmer at nearest higher shilling

(d) Difference between nominal tranport cost received from MOA and actual transport expenses

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-25 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
NEW JUTE BAGS (IN LE '000)

EXPENSES					INCOME		
Arti-cle*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commissions		8,637
1	Salaries (permanent employees)	708	148	856			
2	Contract employees	5	1	6	Total income of activity		8,637
5	Bonuses	992	210	1,203			
5	Additional pension funds	96	30	126	Income net of expenses		3,516
5	Legal pension funds	11	14	25			
5	New pension funds	20	7	27			
6	Position and expense allowances	391	81	472			
7	In-kind benefits	31	10	41			
8	Cash benefits	356	67	423			
	Total Bab I	2,611	568	3,179			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	-	1	1			
2	Fuel & lubricants	1	1	2			
3	Spare parts & supplies	5	2	7			
5	Books and stationery	2	1	3			
6	Water, electricity, gas	3	2	5			
	Subtotal, Goods	11	7	18			
	B. Services						
1	Maintenance	150	4	154			
4	Advertisement & representation	4	2	6			
5	Printing	16	6	22			
6	Transport & communications	223	16	239			
8	Services by public companies	3	2	5			
12	Training	1	-	1			
11	Diverse services	96	12	108			
14	Services to non-employees	5	1	6			
	Subtotal, Services	498	43	541			
	C. Current Transfers						
1	Taxes & fees on commodities	4	2	5			
2	Depreciation	57	16	73			
3	Rent	28	2	30			
4	Interest & financing expenses	1,099	88	1,187			
6	Interest on bonds	3	1	4			
	Subtotal, Current Transfers	1,191	109	1,299			
	D. Special Current Transfers						
7	Provisions other than deprec.	14	62	77			
8	Property taxes	-	-	1			
9	Other allocations	2	2	4			
	Commercial & brokerage expen.	1	1	2			
	Subtotal, Special Current Trans.	17	65	84			
	Total Bab II	1,717	225	1,942			
	Total Bab I & II	4,328	794	5,121			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-26 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
NEW JUTE BAGS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Distribution commission	5,046	
1	Salaries (permanent employees)	675	140	816	Commission on new bags	3,963	
2	Contract employees	8	3	11	Indemnification for missing funds	1	
5	Bonuses	1,149	285	1,435	Price increases	6	
5	Additional pension funds	83	15	98	Total income of activity	------	9,017
5	Legal pension funds	3	-	3			
5	New pension funds	36	2	38	Income net of expenses		3,486
6	Position and expense allowances	359	83	442			
7	In-kind benefits	54	6	60			
8	Cash benefits	337	70	407			
	Total Bab I	2,704	605	3,309			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	3	-	3			
2	Fuel & lubricants	1	3	3			
3	Spare parts & supplies	6	3	10			
4	Packaging	2	-	2			
5	Books and stationery	2	2	4			
6	Water, electricity, gas	3	2	5			
	Subtotal, Goods	17	10	28			
	B. Services						
1	Maintenance	219	5	224			
4	Advertisement & representation	2	3	5			
5	Printing	14	13	28			
6	Transport & communications	206	16	221			
8	Services by public companies	2	3	5			
9	Taxes & fees	1	1	2			
12	Training	-	2	2			
11	Diverse services	191	20	210			
14	Services to non-employees	2	1	3			
	Subtotal, Services	636	64	700			
	C. Current Transfers						
1	Taxes & fees on commodities	4	1	5			
2	Depreciation	80	24	104			
3	Rent	38	2	40			
4	Interest & financing expenses	1,232	18	1,251			
6	Interest on securities	-	4	4			
	Subtotal, Current Transfers	1,354	49	1,404			
	D. Special Current Transfers						
2	Support to others	-	1	1			
7	Provisions other than deprec.	3	76	79			
8	Property taxes	1	1	3			
9	Other allocations	3	5	7			
	Subtotal, Special Current Trans.	8	83	90			
	Total Bab II	2,016	205	2,221			
	Total Bab I & II	4,720	810	5,531			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-27 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
NEW JUTE BAGS (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Distribution commission (a)	10,500	
1	Salaries (permanent employees)	733	88	821	Charges for non-returned bags	17	
2	Contract employees	12	2	14			
5	Bonuses	1,318	156	1,473	Total income of activity		10,517
5	Additional pension funds	98	19	117			
5	Legal pension funds	3	1	4	Income net of expenses		3,532
6	Position and expense allowances	385	61	446			
7	In-kind benefits	40	6	46	(a) 16% commission on (credit) sales of new jute bags to farmers.		
8	Cash benefits	481	47	528			
	Insurance	42	9	51			
	Total Bab I	3,111	388	3,499			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	1	3	4			
3	Spare parts & supplies	7	5	12			
4	Packaging	2	-	2			
5	Books and stationery	3	2	5			
6	Water, electricity, gas	5	3	8			
	Subtotal, Goods	18	13	31			
	B. Services						
1	Maintenance	145	14	159			
	Advertisement & representation	4	1	5			
5	Printing	16	8	24			
6	Transport & communications	141	11	153			
8	Services by public companies	-	6	6			
9	Taxes & fees	9	5	14			
11	Diverse services	95	12	106			
14	Services to non-employees	1	1	2			
	Subtotal, Services	411	58	469			
	C. Current Transfers						
1	Taxes & fees on commodities	2	2	5			
2	Depreciation	79	23	102			
3	Rent	31	1	32			
4	Interest & financing expenses	2,605	97	2,702			
10	Other transfer payments	-	4	4			
	Subtotal, Current Transfers	2,717	127	2,845			
	D. Special Current Transfers						
2	Support to others	-	1	1			
7	Provisions other than deprec.	33	99	132			
9	Other allocations	2	5	7			
	Subtotal, Special Current Trans.	35	105	140			
	Total Bab II	3,183	304	3,486			
	Total Bab I & II	6,294	691	6,985			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-28 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
SUPPLY (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Total income of activity		24,858
1	Salaries (permanent employees)	1,631	544	2,175			
2	Contract employees	10	3	14	Income net of expenses		14,212
5	Bonuses	2,177	726	2,902			
5	Additional pension funds	291	97	388			
5	Legal pension funds	45	15	59			
6	Position and expense allowances	917	306	1,222			
7	In-kind benefits	81	27	108			
8	Cash benefits	1,029	343	1,373			
	Total Bab I	6,181	2,060	8,241			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	3	1	4			
2	Fuel & lubricants	6	2	8			
3	Spare parts & supplies	66	22	88			
4	Packaging	10	3	13			
5	Books and stationery	6	2	8			
6	Water, electricity, gas	9	3	12			
	Subtotal, Goods	99	33	132			
	B. Services						
1	Maintenance	154	51	206			
4	Advertisement & representation	7	2	10			
5	Printing	35	12	46			
6	Transport & communications	172	57	229			
7	Rent of machinery & vehicles	2	1	3			
8	Services by public companies	6	2	8			
9	Taxes & fees	1	-	1			
12	Training	4	1	5			
11	Diverse services	116	39	155			
14	Services to non-employees	7	2	9			
	Subtotal, Services	504	168	672			
	C. Current Transfers						
1	Taxes & fees on commodities	17	6	23			
2	Depreciation	328	109	438			
3	Rent	34	11	45			
4	Interest & financing expenses	675	208	883			
6	Interest on bonds	6	2	8			
	Subtotal, Current Transfers	1,060	336	1,396			
	D. Special Current Transfers						
2	Support to others	1	-	1			
7	Provisions other than deprec.	136	45	181			
8	Property taxes	1	-	2			
9	Other allocations	15	5	19			
	Subtotal, Special Current Trans.	153	51	204			
	Total Bab II	1,816	588	2,405			
	Total Bab I & II	7,997	2,649	10,646			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-2

TABLE D-29: PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/87

SUPPLY (IN L.E.'000)

This table could not be completed since information for the PBDAC headquarters was not available.

TABLE D-30 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
SUPPLY (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Shortfalls (a)	26	
1	Salaries (permanent employees)	2,005	321	2,326	Commissions (b)	24,042	
2	Contract employees	19	4	23	Rounding up (c)	128	
5	Bonuses & Incentives	3,545	560	4,105	Surpluses (d)	391	
5	Additional pension funds	194	41	235	Incentives from the fund (e)	5	
5	Legal pension funds	17	4	21	Profit from sale of jute bags (f)	29	
5	Non Pension funds	67	21	88	Miscellaneous (g)	1,274	
6	Position and expense allowances	1,104	212	1,316	Net surpluses (d) and reclassification (h)	23	
7	In-kind benefits	89	22	111			
8	Cash benefits	1,161	164	1,325			
	Cost of living supplement	8	-	9	Total income of activity		25,919
	Insurance	245	51	297			
	Additional social support	16	-	16	Income net of expenses		12,823
	Additional social assistance	30	1	31			
	Total Bab I	8,500	1,404	9,903			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	-	12	12			
2	Fuel & lubricants	3	6	10			
3	Spare parts & supplies	125	11	136			
4	Packaging	8	-	8			
5	Books and stationery	5	5	10			
6	Water, electricity, gas	13	9	23			
	Subtotal, Goods	154	43	199			
	B. Services						
1	Maintenance	175	31	206			
4	Advertisement & representation	8	3	11			
5	Printing	64	18	82			
6	Transport & communications	167	30	197			
7	Rent of machinery & vehicles	1	-	1			
8	Services by public companies	5	15	20			
12	Training	1	2	2			
11	Diverse services	167	36	204			
14	Services to non-employees	24	3	27			
	Subtotal, Services	612	138	750			
	C. Current Transfers						
1	Taxes & fees on commodities	18	6	23			
2	Depreciation	474	52	526			
3	Rent	44	4	48			
4	Interest & financing expenses	757	269	1,026			
	Subtotal, Current Transfers	1,293	331	1,623			
	D. Special Current Transfers						
1	Contributions	-	3	3			
7	Provisions other deprec.	319	246	564			
8	Property taxes	1	-	1			
9	Other allocations	21	10	31			
	Commercial & brokerage expenses	1	-	1			
	Cash allowances	1	-	1			
	Interest on securities	-	11	11			
	Participations, taxes+fees abroad	1	9	10			
	Subtotal, Special Current Trans.	344	279	622			
	Total Bab II	2,401	792	3,193			
	Total Bab I & II	10,900	2,196	13,096			

(a) Fines on storekeepers for missing goods (official price plus 10% on double the price).

(b) Different commissions on purchase from farmers at guarantee prices and on sale of certain basic foodstaffs, at rates set periodically by MOA

(c) Costs quoted in millins paid by farmer in nearest higher shilling.

(d) Excess of distibution costs received from Ministry of Supply over actual expenditures.

(e) Bonuses received from Ministry of Supply for persons working in supply operations and not yet distributed.

(f) Sale of used bags to farmers - PBDAC's part of profits

(g) Main items are BDAC's part of profits from used bag sales (LE 610,000) and PBDAC's part in commissions (LE 491,000).

(h) Income from reclassifying goods at a higher grade.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-31 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
COMMERCIAL OPERATIONS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Transport	92	
1	Salaries (permanent employees)	972	275	1,247	Insurance and commissions	11,663	
2	Contract employees	4	3	7	Interest and bonuses	1,555	
5	Bonuses	2,873	402	3,275	Rounding up (a)	474	
5	Additional pension funds	128	46	174	Discount (b)	1	
5	Legal pension funds	12	5	18			
5	New pension funds	64	5	69	Total income of activity		13,785
6	Position and expense allowances	559	156	715			
7	In-kind benefits	31	9	40	Income net of expenses		6,957
8	Cash benefits	490	134	624			
	Total Bab I	5,133	1,035	6,168			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	1	2	3			
3	Spare parts & supplies	2	2	4			
5	Books and stationery	3	2	5			
6	Water, electricity, gas	3	1	4			
	Subtotal, Goods	9	7	16			
	B. Services						
1	Maintenance	9	2	11			
4	Advertisement & representation	1	1	2			
5	Printing	12	9	22			
6	Transport & communications	152	15	167			
8	Services by public companies	1	3	4			
12	Training	1	-	1			
11	Diverse services	16	9	26			
14	Services to non-employees	8	1	9			
	Subtotal, Services	200	40	242			
	C. Current Transfers						
1	Taxes & fees on commodities	2	1	3			
2	Depreciation	19	19	38			
3	Rent	9	4	14			
4	Interest & financing expenses	245	-	245			
6	Interest on bonds	15	-	15			
	Subtotal, Current Transfers	290	24	315			
	D. Special Current Transfers						
7	Provisions other than deprec.	74	10	83			
9	Other allocations	4	-	4			
	Subtotal, Special Current Trans.	78	10	87			
	Total Bab II	578	83	660			
	Total Bab I & II	5,711	1,117	6,828			

(a) Costs quoted in millins paid by farmers in nearest higher shilling.

(b) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-32 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
COMMERCIAL OPERATIONS (IN LE '000)

EXPENSES					INCOME		
Arti-cles	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission	15,452	
1	Salaries (permanent employees)	1,464	280	1,745	Income of branches	315	
2	Contract employees	4	1	5	Rent and transport	152	
5	Bonuses & incentives	4,004	535	4,539	Transport expenses & interest	1,073	
5	Additional pension funds	143	28	171	Rounding up (a)	59	
5	Legal pension funds	4	1	5	Bonuses	1,006	
5	New pension funds	67	7	73	Insurance	55	
6	Position and expense allowances	874	175	1,049	Discount (b)	2	
7	In-kind benefits	54	12	67	Storage fees	27	
8	Cash benefits	619	115	735	Profit margin	2	
	Schooling and holiday bonuses	13	2	16			
	Cost of living supplement	7	1	8	Total income of activity		18,141
	Insurance	106	18	124			
	Additional social support	22	1	23	Income net of expenses		6,947
	Total Bab I	7,382	1,178	8,560			
	Bab II (Goods & Services)						
	A. Goods						
2	Fuel & lubricants	3	2	5			
3	Spare parts & supplies	6	3	9			
5	Books and stationery	3	3	6			
6	Water, electricity, gas	4	2	6			
	Subtotal, Goods	17	9	26			
	B. Services						
1	Maintenance	9	3	12			
4	Advertisement & representation	4	1	5			
5	Printing	25	10	35			
6	Transport & communications	215	13	228			
8	Services by public companies	2	5	7			
11	Diverse services	54	11	65			
14	Services to non-employees	8	3	11			
	Subtotal, Services	319	47	366			
	C. Current Transfers						
1	Taxes & fees on commodities	3	4	6			
2	Depreciation	30	27	56			
3	Rent	34	2	37			
4	Interest & financing expenses	1,868	-	1,868			
	Subtotal, Current Transfers	1,935	32	1,967			
	D. Special Current Transfers						
7	Provisions other than deprec.	204	63	268			
8	Property taxes	1	-	1			
9	Other allocations	4	-	4			
	Commercial & brokerage expen.	2	1	3			
	Subtotal, Special Current Trans.	210	64	275			
	Total Bab II	2,480	153	2,634			
	Total Bab I & II	9,862	1,332	11,194			

(a) Costs quoted in millims paid by farmer in nearest higher shilling.

(b) In the case of sale to individuals, PBDAC takes the 5% discount which is given on sales to GOE authorities.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-33 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
COMMERCIAL OPERATIONS (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				PBDAC commission (a)		16,154
1	Salaries (permanent employees)	1,432	249	1,681	Receipts of Sohag bank on sale of chemicals		14
2	Contract employees	7	-	7			
5	Bonuses	3,371	297	3,668	Commission on sale of chemicals	303	
5	Additional pension funds	205	37	242	Commission on sale of ag. machinery	272	
5	Legal pension funds	14	3	17		---	575
6	Position and expense allowances	780	162	942			
7	In-kind benefits	196	53	249	Branches (b):		
8	Cash benefits	1,126	213	1,339	Cairo	23	
					Alexandria	68	
	Total Bab I	7,131	1,016	8,147	El Arish	34	
						---	124
	Bab II (Goods & Services)						---
	A. Goods				Total income of activity		16,867
2	Fuel & lubricants	2	2	4			
3	Spare parts & supplies	3	3	7	Income net of expenses		6,764
5	Books and stationery	3	3	6			
6	Water, electricity, gas	6	2	8			
	Subtotal, Goods	14	10	25			
	B. Services						
1	Maintenance	11	5	16			
4	Advertisement & representation	5	2	7			
5	Printing	19	11	31			
6	Transport & communications	229	12	240			
8	Services by public companies	1	5	7			
9	Taxes & fees	1	1	1			
11	Diverse services	42	16	58			
14	Services to non-employees	15	4	19			
	Subtotal, Services	323	56	379			
	C. Current Transfers						
1	Taxes & fees on commodities	2	5	7			
2	Depreciation	31	19	49			
3	Rent	44	4	48			
4	Interest & financing expenses	1,348	-	1,348			
	Subtotal, Current Transfers	1,425	28	1,452			
	D. Special Current Transfers						
2	Support to others	1	-	1			
7	Provisions other than deprec.	52	47	99			
8	Property taxes	-	-	1			
	Subtotal, Special Current Trans.	53	47	101			
	Total Bab II	1,815	141	1,957			
	Total Bab I & II	8,946	1,157	10,103			

(a) Commission on sales of tractors, foliar fertilizers, etc.

(b) Share of PBDAC branches in the commission.

* GOE public service classification

Note: Totals may include rounding-off errors

SOURCE : PBDAC

TABLE D-34 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1986
FUMIGATION (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commissions & interest	935	
1	Salaries (permanent employees)	195	42	237			
2	Contract employees	2	-	2	Total income of activity		936
5	Bonuses	276	58	334			
5	Additional pension funds	17	11	28	Income net of expenses		(329)
5	Legal pension funds	1	5	6			
6	Position and expense allowances	128	20	148			
7	In-kind benefits	5	16	22			
8	Cash benefits	94	20	114			
	Total Bab I	718	171	890			
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	114	-	114			
2	Fuel & lubricants	7	-	7			
3	Spare parts & supplies	53	-	53			
5	Books and stationery	1	-	1			
6	Water, electricity, gas	2	-	2			
	Subtotal, Goods	177	0	177			
	B. Services						
1	Maintenance	10	1	12			
4	Advertisement & representation	-	-	1			
5	Printing	-	2	2			
6	Transport & communications	40	6	47			
8	Services by public companies	3	-	3			
12	Training	1	-	1			
11	Diverse services	11	4	15			
14	Services to non-employees	2	1	3			
	Subtotal, Services	67	14	84			
	C. Current Transfers						
1	Taxes & fees on commodities	-	-	1			
2	Depreciation	55	5	59			
3	Rent	1	-	1			
4	Interest & financing expenses	4	25	29			
6	Interest on bonds	1	-	1			
	Subtotal, Current Transfers	61	30	91			
	D. Special Current Transfers						
7	Other replacement provisions	2	20	23			
8	Property taxes	-	1	1			
	Subtotal, Special Current Trans.	2	21	24			
	Total Bab II	307	69	375			
	Total Bab I & II	1,025	240	1,265			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-35 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1987
FUMIGATION (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Fumigation of supply crops & seeds	112	
1	Salaries (permanent employees)	221	50	271	Fumigation of bags	25	
2	Contract employees	1	1	2	Pest control of warehouses, PBDAC	16	
5	Bonuses & incentives	345	115	460	& BDACs (a)		
5	Additional pension funds	26	5	31	Pest control, public & private	529	
5	Legal pension funds	1	-	1	sectors (a)		
5	New pension funds	4	-	4	Purchase & resale of fumigation gas	54	
6	Position and expense allowances	137	27	165	Fumigation for the Armed Forces	55	
7	In-kind benefits	30	3	32	Profit on tools, supplies	8	
8	Cash benefits & add. soc. supp.	86	25	111	& waterproofing materials		
					Commissions	185	
	Total Bab I	851	227	1,078	Transport and price differentials (b)	227	

	Bab II (Goods & Services)				Total income of activity		1,211
	A. Goods						
1	Raw materials	44	-	44	Income net of expenses		(238)
2	Fuel & lubricants	10	1	10			
3	Spare parts & supplies	124	1	124			
5	Books & stationery	-	-	1			
5	Water, electricity, gas	1	-	1			
	Subtotal, Goods	179	2	180			
	B. Services						
1	Maintenance	10	2	11			
4	Advertisement & representation	1	1	3			
5	Printing	1	2	3			
6	Transport & communications	51	6	56			
7	Rent of machinery & vehicles	7	-	7			
12	Training	-	1	1			
11	Diverse services	9	7	16			
	Subtotal, Services	79	19	97			
	C. Current Transfers						
2	Depreciation	32	9	41			
4	Interest & financing expenses	2	4	6			
6	Interest on bonds	-	2	2			
	Subtotal, Current Transfers	34	15	49			
	D. Special Current Transfers						
7	Provisions other than deprec.	3	37	40			
8	Property taxes	-	1	1			
9	Other allocations	-	1	1			
	Subtotal, Special Current Trans.	3	39	42			
	Total Bab II	295	76	372			
	Total Bab I & II	1,146	303	1,449			

(a) Income from specialized fumigation services performed by PBDAC for various entities.

(b) Difference between pre-established transport costs and actual expenses.

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

TABLE D-36 : PBDAC GROUP - CONSOLIDATED STATEMENT OF INCOME AND EXPENSES - 30/6/1988
FUMIGATION (IN LE '000)

EXPENSES					INCOME		
Article*	ITEM	Direct Exp.	Indir. Exp.	Total Exp.	ITEM	Partial	Total
	Bab I (Personnel)				Commission (a)	1,008	
1	Salaries (permanent employees)	217	30	246	Fumigation charges	427	
5	Bonuses & Incentives	555	50	605	Diverse charges	39	
5	Additional pension funds	23	6	29		---	
5	New pension funds	8	1	9	Total income of activity		1,564
6	Position and expense allowances	128	20	149			
7	In-kind benefits	33	3	36	Income net of expenses		(284)
8	Cash benefits	206	18	223			
	Total Bab I	1,170	130	1,300	(a) Paid by the owner of the grain		
	Bab II (Goods & Services)						
	A. Goods						
1	Raw materials	43	-	43			
2	Fuel & lubricants	10	1	11			
3	Spare parts & supplies	198	2	200			
5	Books and stationery	1	-	1			
6	Water, electricity, gas	3	1	4			
	Subtotal, Goods	255	4	259			
	B. Services						
1	Maintenance	19	4	23			
4	Advertisement & representation	1	-	1			
5	Printing	5	2	7			
6	Transport & communications	71	4	75			
7	Rent of machinery & vehicles	5	-	5			
8	Services by public companies	-	2	2			
9	Taxes & fees	-	1	1			
11	Diverse services	11	4	15			
	Subtotal, Services	112	17	129			
	C. Current Transfers						
1	Taxes & fees on commodities	1	1	2			
2	Depreciation	26	6	32			
3	Rent	1	-	1			
4	Interest & financing expenses	23	52	75			
6	Interest on bonds	-	2	2			
	Subtotal, Current Transfers	51	61	112			
	D. Special Current Transfers						
2	Support to others	-	1	1			
7	Provisions other than deprec.	3	42	45			
9	Other allocations	-	2	2			
	Subtotal, Special Current Trans.	3	45	48			
	Total Bab II	420	128	548			
	Total Bab I & II	1,590	258	1,848			

* GOE public service classification
Note: Totals may include rounding-off errors
SOURCE : PBDAC

Annex E:

DEPENDENCE OF CREDIT DEMAND ON DISTRIBUTION OF INPUTS

A brief analysis was conducted to explore the extent to which PBDAC's credit demand depends on its distribution of inputs. This issue is raised by the concern that divestment of any PBDAC input distribution activities may lead to decreasing the demand for its credit, or the rate of credit repayment.

Because of the unavailability of reliable data or statistics, the following estimates are based largely on personal judgment of the interviewees.

ESTIMATED PERCENTAGE OF CASH VS. CREDIT PURCHASES

Input	% Purchased For Cash	% Purchased For Credit
Fertilizers	20%	80%
Seeds	5%	95%
Pesticides	-	100%
Spare parts	7%	93%
Supply	-	-
Feed	100%	-
Jute bags	100%	-
Fumigation	100%	-

Even though the percentages above are only indicative, it is safe to assume that four of the eight input distribution activities are independent of the availability or unavailability of in-kind credit. These are supply (purchasing crops at guaranteed prices), livestock feed, jute bags and fumigation of crops in storage.

For the other activities (fertilizers, seeds, pesticides and spare parts), most of the farmers' demand is in the form of in-kind credit. Beyond a doubt, the large majority of small farmers need credit of some type for their working capital needs. However, it could not be confirmed that such credit must be in-kind. The only exception is aerial spraying of cotton, which is likely to be dependent on in-kind provision of the necessary materials and services.

TABLE F-1 : PBDAC'S ESTIMATES OF THE VALUE OF ITS WAREHOUSES ON 30/6/88, BY GOVERNORATE (IN LE '000)

NO.	Governorate	Purchase Cost	Cost of Improvements	Total Cost	Depreciation	Book Value on 30/6/88	Estimated Present Value
1	Qalyubiya	471	547	1,018	77	941	10,872
2	Menufiya	-	-	-	-	-	-
3	Gharbiya	1,148	932	2,080	263	1,817	6,807
4	Kafr el Sheikh	-	-	-	-	-	-
5	Sharqiya	2,209	89	2,298	342	1,956	13,545
6	Ismailiya	193	-	193	38	155	200
7	Dakahliya	1,068	20,808	21,875	265	21,610	32,874
8	Damietta	251	1,376	1,627	-	1,627	4,192
9	Beheira	3,833	1,001	4,834	816	4,018	16,862
10	Giza	-	-	-	-	-	-
11	Fayoum	-	-	-	-	-	-
12	Beni Suweif	603	1,309	1,912	319	1,593	2,399
13	Minya	8,764	230	8,994	983	8,011	53,345
14	Asyout	363	1,190	1,553	349	1,203	9,738
15	Sohag	3,786	-	3,786	594	3,193	7,364
16	Qena	1,760	-	1,760	397	1,364	3,880
17	Aswan	41	382	422	183	239	6,788
	Total	24,490	27,864	52,352	4,626	47,727	168,866

Annex F:

ASSET VALUE OF THE BDAC WAREHOUSES

As a part of the present study, PBDAC management has requested the BDACs to survey their warehouses for appraising their book value and their estimated current value. Information was received from 13 of the 17 BDACs. For these 13 BDACs, the information presented in Table F-1 shows that:

- The total purchase cost (in Egyptian pounds of the purchase date) was about L.E. 25.5 million.

- The value of improvements amounted to L.E. 27.8 million (most of the improvements were concentrated in Daqahliya, which alone accounted for L.E. 20.8 million). Thus total investment (original cost plus improvements) amounted to L.E. 52.3 million.

- Depreciation amounted to only L.E. 4.6 million, so that the book value of the facilities totalled L.E. 47.7 million. Thus on the average, accumulated depreciation was only 8.8% of the investment cost. It is noteworthy that, except for the small facilities at Aswan which are 43% depreciated, book depreciation reached about 22% of the investment cost only in two other BDACs (Qena and Asyout).

- Most importantly, the estimated present value of storage facilities in the 13 governorates amounted to L.E. 168.8 million. The facilities of Minya alone accounted for L.E. 53.3 million, i.e. 31.6% of the total.

Different BDACs might have used different criteria to assess the present value of their warehouses. In particular, it is not clear whether the value of the land was included or not. This might account for cases such as Qalyubiya, where present value was estimated at 11.55 times book value in spite of the fact that the facilities were only 7.6% depreciated.

Taking these uncertainties properly into account, the information presented by the BDACs may serve at least as a preliminary indication of the present value of the storage facilities.

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