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**Agricultural Market Reforms in Egypt:  
Initial Adjustments in Local Output Markets**

by

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## ABSTRACT

This study represents one of the first attempts to examine the process of adjustment within the farming and marketing sectors to the reform of agricultural markets in Egypt. Eventhough it is primarily based on rice sector data, it gives the following interesting insights into the initial responses to the reform process. First, farmers are reacting with higher output levels and marketed surplus, although the bulk of the expansion has taken place among farms larger than 5 feddans. Marketed surplus among smaller sized farms has hardly changed. Second, the reforms have brought about increased private sector participation in the distribution of foodgrains. However, the level of participation is significant only in terms of local trading. Third, private sector participation in the processing industry has increased in terms of milling capacity, due primarily to the large increase in the number of larger private sector mills. In terms of milled quantities, however, public millers still process the bulk of the output, and have even raised their milling share, while small private mills are losing market shares. Furthermore, millers continue to procure paddy rice and traders continue to process paddy rice, so that it would appear that specialization has not yet occurred in the two subsectors. Finally, concomitant to changes in output levels and marketing behavior are falling real farm foodgrain prices, except for wheat. At the same time, real farm wages and real fertilizer prices have also declined, offsetting some of the effect of falling output prices. Combined with the strong increase in output levels, this would suggest that farmers may be already gaining from the reforms, to the extent that changes in the other cost elements (land and equipment) do not exceed these gains.

## **INITIAL ADJUSTMENTS IN LOCAL OUTPUT MARKETS**

The present part of the study examines the initial adjustment to reforms in the marketing sector of the foodgrain economy, evaluate the progress that has been accomplished so far, and identify potential obstacles to further progress in the reform process. Due to the time limitation and the need to rely to a large extent on secondary information material, the study focuses on the three major foodgrains that are produced in Egypt: wheat, maize and rice. In sections II and III, it reviews the policy environment before the reforms and the main policy changes that have taken place since the inception of the reform program. This is followed by a discussion in section IV of the anticipated adjustment by individual participants and the different subsectors in the domestic marketing system. This provides the framework utilized in Section V to evaluate the actual changes that have taken place over the last few years. The implications for furthering the reform process and other conclusions are presented in the remaining sections of the paper.

### **Policy Environment Before Reforms**

The policy environment for agricultural output marketing is reviewed by briefly discussing the main policy measures that have affected the transfer of agricultural commodities at each individual step of the production-marketing chain, from the farm, through the trading and processing systems, to domestic and foreign consumers. This will be done by using the example of rice and following the individual segments of the distribution chain as represented in Figure 1, where the measures or restrictions applied at

each level of the chain are designated by the Rs. Figure 1 depicts in a systematic manner the complexity of the pre-reform policy environment for agricultural marketing in Egypt and offers a clear overview of points in the marketing chain where adjustments to changes in policies are expected to take place.

The extent to which these policies have been applied has varied across commodities and over time. For instance, intervention has been much heavier in the rice and wheat sectors than in the maize sector. Moreover, the implementation of reforms began much earlier for wheat and maize than for rice, while two other major sectors, cotton and sugarcane, remain excluded from the reform process. Another facet of the intervention system in Egypt is the variability and the unpredictability that it may have induced by changing various policy measures related to crop area, water allocation, processing, and other critical activities in the foodgrain economy, on a year-to-year basis. The various policy measures and the changes that have taken place have been the focus of earlier studies and are discussed in detail in the various benchmark documents (Tranche Reports) prepared by the Agricultural Production and Credit Project (APCP) for the Ministry of Agriculture and Land Reclamation (MALR) at different stages of the reform program<sup>1</sup> The present paper will therefore discuss them only briefly while putting greater emphasis on the adjustment by local markets and different agents in the marketing and processing sectors to the changing policy

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<sup>1</sup> See for example the various ministerial decrees issued to that effect in El Goueli and El Miniawy, 1989; El Miniawy and Gamal El Din, 1989; El Miniawy 1994; as well as the Benchmark Reports III to VI, submitted to USAID by the Ministry of Agriculture and Land Reclamation.

**Figure 1--Rice marketing channels before reforms**

and regulatory environment. Accordingly, the sections discussing individual policy measures examine these more in terms of their implications for the development of domestic marketing systems rather than giving a detailed description of these measures. Similarly, the paper will not dwell on input policies and consumer subsidies, both of which affect the operation of output markets, but are the subject of two other papers under the same project.

**Production and Procurement.** The main policies that have affected foodgrain marketing at this level are i) area controls for different crops, ii) procurement quotas, and iii) restrictions on storage and milling activities by farm households. These policies have affected both the marketed surplus and the marketing behavior by individual farm households. Given the intra-farm production linkages between individual crops, area controls impact on relative output levels and thereby on the marketed quantities (R0). Similarly, restrictions on crop storage and milling by farm households affect the level of marketed surplus and farmer marketing behavior through the impact on intra-household consumption levels (R1). Of particular importance in this case is that restrictions were applied both to quantities and to the period during which these activities could be carried out, thus influencing both the level and seasonal distribution of marketed quantities.

Procurement quotas, on the other hand, have a much more immediate impact, in that they directly determine the allocation of the marketable surplus between potential marketing channels and agents (R2). The example of rice, where delivery quotas averaged nearly 50 percent of production, illustrates this quite well<sup>2</sup>. During the period of the procurement system, delivery quotas have varied between 1.0 and 1.5 tons per feddan,

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<sup>2</sup> Delivery quotas were compulsory for wheat and rice, while marketing of maize has been relatively free.

<sup>3</sup> For Philippini rice, the quota has been as high as 2 tons per feddan (see El Miniawy and Gamal El Din, 1989a; p. 3.)

with average grain yields around 2.5 tons per feddan<sup>3</sup>. With average farm sizes of 2.7 feddans during the eighties, and 77 percent of holdings between 1 to 3 feddans, the compulsory procurement system must have had a considerable impact on the ability of local private markets to develop, independently of all the other restrictions on private trading activities.

One apparent objective of the farm-level policies discussed above was to keep the quantities of grains available to the farm household as close as possible to its own consumption needs in order to maximize public procurement quantities. The reform undertaken at this level should have a significant impact on the development of the domestic trading system in Egypt. Removal of the compulsory delivery system and elimination of the restrictions on storage and milling activities should raise supply on local private grain markets and encourage greater participation by farm households in the marketing of their output, both critical to the development of a functional private trading system.

**Domestic Trading.** Ensuring the proper operation of the public procurement and distribution systems, necessitated a number of additional measures aimed at eliminating or controlling competition from private traders (R3). The prohibition of i) the possession of grains for trading purposes, ii) the storage of grains, except for farmers and only for their own use, iii) the transport of grains across governorate boundaries, and iv) in some cases the funding of marketing activities by commercial banks had the effect of keeping private agents out of the domestic distribution system.

In addition to rendering private trading unlawful, the above measures had the effect of eliminating incentives for private involvement in the distribution of foodgrains.

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<sup>3</sup> For Philippini rice, the quota has been as high as 2 tons per feddan (see El Miniawy and Gamal El Din, 1989a; p. 3.)

For instance, the combination of public pricing (which goes with the procurement system) and the restriction of crop movement keeps the level and spread of prices across surplus and deficit areas low enough to discourage spatial arbitrage. Similarly, restricting funding for trading activities and limiting temporal price spreads through public pricing makes stockpiling a costly and unprofitable business. In both cases, market signals are distorted and discourage private involvement in the spatial and temporal distribution of foodgrains.

Whereas changes in the policies discussed in the previous section should raise the level of marketable quantities in local markets, reform of the above measures should reduce the cost and raise the gains associated with the distribution of commodities and thus encourage greater private participation in local food marketing. Next to the transfer of commodities over time and across space, domestic distribution systems as defined here also include the function of transforming (processing) output into different marketable products. Government intervention in this area and its implications for domestic marketing systems are discussed next.

**Foodgrain Processing.** Processing activities are critical elements of the marketing chain because they help diversify and expand demand for primary commodities. As in the procurement and distribution sectors, government presence in the processing sector has been quite predominant before the reforms. Public mills accounted for the largest share of milling activities. Besides, various restrictions were applied at the level of public as well as private mills to regulate processing activities and to limit competition from the private sector. Moreover, milling by farm households was allowed only for their own consumption purposes and during an officially determined period.

Public processing firms have been subject to technical, organizational, and other types of restrictions that impacted on their usable capacity as well as the actual level and seasonal distribution of their activities (R4). The main restrictions faced by private

milling companies included limits to their overall number, the quantities that they were allowed to mill, and the period during which they could operate (R5&R6)<sup>4</sup>. Moreover, restrictive measures were put in place to link the operation of the larger commercial mills to public companies.

The need to keep the public procurement and distribution systems functional made direct intervention in the milling industry unavoidable. A direct consequence of past government intervention in this area is the sharp technological segmentation of the milling and processing industries, as illustrated by the example of the rice sector. The private rice milling sector, which now accounts for about one half of the total milling capacity, uses much less advanced techniques than public mills. The public sector, on the other hand, uses highly sophisticated techniques which, together with high labor cost, have held processing costs excessively high<sup>5</sup>. The intervention in the milling industry was mainly directed towards controlling domestic distribution channels. However, besides its implications for domestic distribution systems, its impact on applied technologies and the structure of costs in the processing sector must have hurt competitiveness in the exporting rice sector.

Intervention in the milling industry has affected domestic marketing systems, to the extent that it has restricted i) the access to mills by farmers and private traders and ii) the participation of private mills in foodgrain marketing activities (procurement, storage, transport, or sales activities). Policy changes at this level should contribute to increasing competition on local markets as millers expand their procurement and sales operation. Most importantly, the reduction in milling costs that should result from the changes in

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<sup>4</sup> See examples in MARL/APCP, 1992; Annex II, P. 14; and El Miniawy and El Din. 1989a; pp. 3-8.

<sup>5</sup> For instance, information on rice milling costs shows that these accounted for 25 to 45 percent of the costs of the final product during 1983/84 and 1992/93 (see El Amir, R. and E. G. El Din, 1994), compared to about 5 percent in Bangladesh for example.

milling regulations would contribute to raising the competitiveness of local foodgrains in domestic markets. Particularly rice exports should gain in terms of increased competitiveness in export markets. However, restrictions in the processing industry constituted only one set of restrictions that have affected the performance of rice exports, the only foodgrain exported by Egypt. The other set consists of regulations which specifically dealt with the export of rice. These constitute the last set of restrictions affecting the operation of domestic grain markets and are discussed in the next section.

**Exports.** Prior to the reforms initiated in 1991/1992, rice exports were under the strict control of public export companies. Private milling and trading companies were entirely excluded from export activities, as export companies received their supplies exclusively from public marketing companies. Furthermore, export operations by exporting companies were subject to a host of restrictions applying to contracting, pricing, and quantities of exports (R7).

The consequence of the various measures that were used to regulate rice exports was increased operating costs of exporting companies and a lack of flexibility in the exporting sector, rendering it unable to adjust to changes in international markets. The reforms being undertaken should consequently lead to a more responsive and more competitive export sector.

### **Changes in Marketing Policies**

The first reforms were introduced in 1986 and covered only a subset of crops. Among the foodgrains considered in the study, wheat and maize were part of the subset while rice was excluded from the reforms until five years later. The reforms were triggered by the need to eliminate the various restrictions surrounding the production and distribution, processing and export of foodgrains in Egypt. As indicated by the discussion in the previous section, the policy and regulatory environment that prevailed before the reforms was not conducive to sustaining growth and competitiveness in the foodgrain

economy of Egypt. As shown in section 5 and later in the section on the integration of grain markets, production of major foodgrains has skyrocketed at unprecedented rates just after the reforms.

The reforms undertaken between 1986 and 1991 have gradually eliminated the bulk of the restrictions that had plagued the marketing and processing of foodgrains. Area restrictions have been removed and compulsory procurement quotas and pricing have been replaced by optional delivery and floor pricing mechanisms. The restrictions on foodgrain transport, storage, and milling have also been lifted, as well as the ban on rice exports by private exporters. In addition to the above changes, which were designed to increase private sector participation in the marketing and processing of foodgrains, further initiatives were taken to adjust the operations of the public intervention system to the liberalized marketing environment. The recent creation of the Holding Company for Rice Milling and Marketing and the hiring out of services by public mills to private traders are some illustrations of the adjustment which is taking place within the public system.

Figure 2 presents the new foodgrain marketing and processing systems after the introduction of the reforms. Two types of adjustment have taken place. The first change is the increased and unintermediated participation of private agents in the marketing and milling of foodgrains, as suggested by the left-hand-side boxes of Figure 2. Private merchants and millers can now openly and without restrictions participate in distribution and processing activities. More importantly, private exporters are allowed to operate without licensing restrictions. The initial responses at the farm-level, as well as within the marketing, processing and export sectors are examined in the following sections.

### **Anticipated Responses to the Reform Process**

Before examining the available evidence on the adjustment process within the

marketing and processing sectors, the changes that would be expected to follow from the adopted reforms and based on the policy and regulatory environment that prevailed before are discussed in the present section. This is important because reforms are still at an early stage and some of the benefits associated with such changes may not have fully materialized yet. Besides providing a framework for the discussion of the adjustment process, the summary of expected changes facilitates the interpretation and evaluation of the actual changes that have so far taken place within the Egyptian foodgrain economy<sup>6</sup>. First, expected adjustments in terms of private sector participation and activity levels are presented for the distribution and processing sector. The expected changes in terms of cost and price

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<sup>6</sup> The changes that are identified as expected changes in this section do not necessarily have to come about, since the adjustment process may be hampered by a variety of institutional and structural factors. But, even in this case, the framework discussed here would be quite useful in helping to identify the problem.

**Figure 2--Rice marketing channels after reforms**

structures are then examined. The discussion uses the example of the rice sector, which was the last foodgrain sector to be affected by reforms.

Table 1 presents the anticipated adjustment by individual market participants in terms of activities such as storage, local trading and spatial arbitrage. The number of Xs displays the extent to which individual agents are expected to participate in a given activity. The Os indicate no participation or insignificant levels of activities.

The first row of the table indicates the expected adjustment at the farm level. The table does not include a column for marketed surplus, since this would apply only to farmers. It is, however, anticipated that removal of the restrictions on private trading would raise marketed quantities by reducing the cost of marketing to farmers and by increasing access to marketing services. There might be differences across farm sizes and farming regions, but the overall effect of reforms on the level of marketed surplus should be positive.

In terms of storage, farmers are not expected to change their behavior in a significant way, inspite of the fact that farm-level storage activities were strictly controlled in the pre-reform era. In the context of fixed prices during that era, farmers may have stored grain only to fetch better prices outside of the procurement system. With the improvement of outlet facilities, farmers are now facing increased incentives to sell. On the other hand, the upward flexibility of prices in the new system add to the incentives to store. These two opposite influences may leave farm storage level close to their pre-reform levels.

In contrast, direct sales to consumers in local markets by farmers are expected to drop, independently of changes in the overall level of marketed surplus. This is because the restrictive control of private trader participation in local marketing had the effect of raising direct marketing activities by farmers in the old system. To the extent that the entry of new traders leads to the development of local distribution systems, farmers will

make more use of the emerging intermediation system and reduce their own direct marketing activities.

**Table 1--Expected initial adjustments in the distribution sector.**

Participants	Storage		Local trading		Intergovernorate	
	Trading		Before	After	Before	After
	Before	After				
Farmers	X	X	XX <sup>1)</sup>	X <sup>1)</sup>	O	O
Traders	O	XX	O	XXX	O	XX
Parastatals	XXX	XX	XXX	XX	XXX	XXX

Note: <sup>1)</sup> This X refers only to sales to consumers by farmers in the absence of a specialized intermediation sector due to the prohibition of private trading. It does not refer to the marketed surplus which is expected to rise.

In the case of intergovernorate trading, farmer participation is expected to remain insignificant as it has been in the pre-reform system. Whereas it was prohibited previously, it is unlikely that farmers would have any comparative advantage or see much incentives to engage in this type of activity.

The second row of the table shows the changes that are expected at the level of private traders. Under normal circumstances, the lifting of the prohibition of private involvement in marketing activities should lead to increasing levels of private participation in local and intergovernorate trading during the first few years following the

reforms. The increase in storage activities follows from the emerging trading activities.

Perhaps of much greater interest are the adjustments within the parastatals sector. As pointed out earlier, marketing activities have been heavily dominated by parastatals operating under a multitude of restrictions that have practically sheltered them from any meaningful competition. With the removal of these restrictions and the emerging competition, parastatals would reduce the level of their activities. But unless they are completely dismantled, the reduction in activity levels would take place only gradually as the private sector develops. Consequently, parastatals are expected to remain major players during the first years after the reforms.

Private sector competition can be expected to develop faster in local than long distance trading. Furthermore, to the extent that the system of floor pricing is effective and narrows spatial price spreads, the private sector might lack the incentives to compete with the public sector in that part of the market. Marketing activities by parastatals would in this case shift towards long distance trading and away from local markets.

With respect to the milling sector, the anticipated patterns of adjustment are depicted in Table 2. For the same reason given above with respect to the participation of farmers in marketing activities, on-farm milling activities are not expected to change dramatically. On the one hand, the lifting of constraints that have restricted farm level milling to own consumption purposes would exert a positive influence on milling activities. On the other hand, the opportunity to market through the emerging private sector would reduce the need for farm-level processing beyond own consumption needs. Because this would involve small quantities, farmers would continue to use small local mills, as they did in the pre-reform era.

**Table 2-- Expected initial adjustments in the milling sector**

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Small	Large
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Service users	Private mills		Private mills		Public mills	
	Before	After	Before	After	Before	After
Farmers	X	X	O	O	O	O
Traders	O	XXX	O	XX	O	X
Parastatals	O	O	X	XX	XXX	XX

Note: The Xs denote the level at which farmers, traders, and parastatals use the services of individual categories of mills. O indicates negligible levels of use.

In contrast, private traders are expected to participate to a much greater extent in processing activities. Given the current cost structure in the milling industry and the relative accessibility of milling services, traders could be expected to use predominantly the cheaper and more accessible small mills. Demand for milling services from large millers should also increase, albeit probably to a lesser extent, following the expansion of transactions by wholesalers that move large enough quantities to require that level of capacity. Public mills would most likely be used only by private exporters in the case of rice or by traders dealing with the higher quality segments of the domestic wheat product market.

Public marketing companies on the other hand should face increasing incentives to increase use of lower cost large mills and perhaps at the expense of the more expensive public mills. The use of commercial (large) private mills by public companies will primarily depend on i) the future level of their involvement in export trade and ii) the quality mix of their exports. If they would continue to export predominantly very high quality rice products, their use of private sector mills would be constrained, at least in the short to medium run, by the unavailability of adequate milling technologies in that sector. But in any case, use of public mills by parastatals should be expected to decrease as competition from private traders reduces their overall level of activity.

The anticipated adjustments depicted above would induce changes in cost and price structures in the marketing and milling sectors. The way in which these adjustments are

expected to impact on marketing and processing costs in the private and public sectors, and on foodgrain prices is summarized in Table 3. Overall marketing costs are expected to decrease, even though the adjustment paths may vary between the private and public sectors. Marketing costs in the public sector are expected to decrease, because the pressure generated by private competitors and the reduction in subsidies that accompany the marketing reform process would induce public companies to slash their costs in order to stay in business.

**Table 3--Other indicators of expected market adjustment**

	Direction of Expected Change
Marketing cost	-
Processing cost	-
Farm prices	+-
Consumer prices	--+
Seasonality of	-
* Prices	-
* Processing operations	-
* Marketing operations	-
Specialization in	
Distribution system	+
Capacity utilization	
In processing	+

Marketing costs in the private sector could increase initially before falling after full adjustment has taken place. The initial increase might come from the initially low level of competition and the relatively high cost involved in expanding trading activities from levels which would not be large enough to allow economies of scale. As competition increases, efficiency levels in the emerging sector improve, and take over from the public

sector proceeds to allow economies of scale to set in, operating cost in the private marketing sector would start to decline. However, given the initially large share of the public marketing sector, total marketing cost should start falling even before full adjustment takes place in the private sector.

Initial cost adjustment in the private processing sector depends primarily on the rate of expansion of demand for milling services and the available excess capacity in that sector. To the extent that milling restrictions in the pre-reform era had generated excess capacity in the private processing industry, milling cost in that sector would initially decrease. As demand expands and the industry approaches full capacity, milling cost would start to rise. In contrast, milling cost in the public processing sector should be expected to fall from the start as competition from private companies increases and inefficiencies from the monopolistic era are gradually eliminated. As in the case of the marketing sector, overall processing cost should decrease due to the initially overriding role of the public processing sector.

The most critical question about reforming foodgrain markets is how that would affect farm and consumer prices. In principle, one would expect the changes in marketing and processing costs depicted above to be reflected in farm and consumer prices. Market prices are, however, determined by many other factors besides costs in the marketing and processing sectors. In addition to market reforms, changes in productivity, supply and demand conditions, world market prices and regulations of export and import activities all impact on the level of farm prices. The direction of changes in farm prices in the private and public sector are therefore more difficult to predict than in the previous examples. Thus, the signs in the third and fourth rows of the table are rather an indication of the direction of the influence of changes in the marketing sector on farm prices and not necessarily of the actual change in prices.

The overall direction of the impact on foodgrain prices will depend on the pre-reform

pricing regimes and the relative changes in the private and public sectors. Basically, farm prices would tend to rise if pre-reform public pricing regimes had ended up taxing foodgrain production. Similarly, they would increase if the number of entering traders is high enough to allow real competition within the emerging private sector and between that sector and the public procurement system. However, if the pre-reform procurement and distribution system had primarily subsidized marketing costs to keep consumer prices low, the new system would most likely lead to lower farm prices and higher consumer prices to reflect the real cost of intermediation. Finally, consumer prices are more likely to increase with the reforms if the latter are accompanied with the removal of foodgrain price subsidies, as is the case in Egypt.

Given the extensive control of sales and milling operations in the old system, it is equally important to look at how reforms might affect seasonality in the marketing and processing sectors. The likely implications of adopted policy changes in that respect are summarized in the remainder of Table 3. The removal of the various regulations that formerly restricted the start and length of the marketing and processing periods should result in a more efficient seasonal distribution of activities in these two sectors. Consequently, seasonality in marketing and processing operations, as well as in prices, should decrease in the new system.

Equally important for the success of marketing reforms is their impact on the level of capacity utilization and specialization in the processing and marketing sectors, and thereby on unit costs in the distribution system. For instance, the elimination of the barriers to entry and other restrictions on the operations of the private sector would reduce the incentives to farmers to parallelly operate as merchants and induce them to rely more on the emerging local trading sector for the distribution of the excess output. Similarly, increased private sector participation would encourage the emergence of specialized millers and traders. Finally, capacity utilization would increase as the increasingly

competitive processing sector adjusts to eliminate the mainly institutionally-created excess capacities of the old system, both in the private and public subsectors.

The next step of the analysis is to use the above framework to examine the adjustment of the foodgrain marketing and processing sectors to the process of reform.

### **Initial Responses**

The reform programs are relatively recent and further reforms are still expected to come, especially in the cotton, sugarcane or perhaps even water management sectors. The responses that are observed hitherto are in all probability the initial signs of adjustment in the foodgrain sector. As the system continues to react to the changes that are already implemented and the reform expands to other sectors and activities, the adjustment process is expected to continue. A better understanding of what has happened so far is therefore critically important, not only in terms of taking stock, but also in terms of identifying the weaknesses in the emerging system and potential obstacles to a successful continuation of the reform process.

Following the discussion of intervention measures in section II, the analysis in this section will be carried out at the different levels of the distribution and processing chain, to examine the adjustment by farmers, traders, processors, and exporters to the changes in the policy and regulatory environment of the foodgrain economy. Given the time limitations and the need to rely on secondary data, the analysis draws heavily on the example of rice, due to the fact that data were more readily available for this sector.

Before turning to the actual adjustment process in the marketing sector, the major changes that have occurred in the food grain economy are summarized. The changes in the level and variability of foodgrain prices during the reform process are discussed first, followed by a presentation of the changes in output levels. The changes in prices are depicted in Figures 3 and 4. Figure 3 shows the changes in the ratio between domestic

and international price levels in real terms. For most of the period, maize prices lay significantly above their international levels but have started to converge since the beginning of the reform process. Wheat prices, on the other hand, have been slightly below international levels, with the exception of a few years during which they exceeded world prices. The average wheat price ratio has not changed much during the reforms, a steep increase can however be observed shortly after the reforms, following a period of continuous decline during the preceding years. In sum wheat prices are now closer to their international levels than they have been during most of the period covered by the graph. In contrast, the domestic price of rice has hardly reached more than 50 percent of world prices. After a temporary upsurge during the early eighties, domestic prices have gone back to their level of the mid-seventies, still leaving a considerable gap between domestic and international prices.

Figure 4 presents further indication of changes in farm prices, this time in terms of their absolute real values. It shows the contribution of internal price changes to the relative price trends depict above. Whereas real prices for wheat rose on average after 1986 compared to the period before, they fell rather rapidly for maize and to a lesser extent for rice. The decline in prices towards the end of the period covered by the graph suggests that wheat and maize prices have converged further to international levels. The decline in rice prices, however, causes some concerns, given the still large gap between domestic and international prices. What this implies is that rice prices are bound to increase significantly from their present levels, as the adjustment process goes on.

Comparing the above changes with changes in farm production costs and changes in output levels would give some indication as to the likely impact of reforms on farmers. Full information on changes in production costs are not available but there is indication that both real wages and fertilizer prices have been also declining. Rural wages, after a period of rapid increases since the mid-seventies, have fallen sharply during the reforms<sup>7</sup>.

According to the Fertilizer Impact Study by the International Fertilizer Development Center (IFDC), fertilizer prices have fallen by as much as 30 to 50 percent in relation to crop prices<sup>8</sup>. Since labor and fertilizer account for more than 50 percent of crop production cost, these changes are likely to compensate to a large extent the observed drop in real farm foodgrain prices.

Farmers may have also benefitted from the strong upsurge in output, as reflected in Figure 2. For all three foodgrains, output has been growing at a rapid and sustained pace since the inception of reforms and after a ten-year period of relative stagnation. The combined trend in output levels and the partial changes on the cost side would suggest that farmers in the foodgrain sector are gaining from the reform process, despite falling real prices. The strong, sustained, and seemingly unprecedented across-the-board growth in output levels would by itself indicate a real improvement in the farming environment. However, more information on cost trends for farm land, equipment, and other farm inputs would be needed to have a definite answer to the above question.

Other developments that need to be followed closely are the changes in wages and related adjustments in the rural labor market. If falling wages are not offset by faster increases in labor demand, then measures should be identified to help alleviate the burden of the reforms on rural laborers.

Further indication of the adjustment process within the foodgrain marketing system can be obtained by looking at changes on the consumption side. A major element of the reforms being the shift from a public dominated to a liberalized and competitive system of distribution, it is of great interest to examine the links between producer and consumer prices and between prices across space and over time. Figure 5 has been prepared for that

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<sup>7</sup> See Goueli and El Miniawy, 1989, p. 24.

<sup>8</sup> See International Fertilizer Development Center (IFDC), 1993.

purpose, which shows the trends in the relationship between farm and wholesale prices for the three crops before and after implementation of the reform programs. Except for rice, wholesale prices have been oscillating around farm price levels for most the period before reforms. Wholesale prices lay below farm prices in a number of years, indicating a tendency in the former public procurement and distribution system towards subsidizing distribution costs. Since the inception of the reforms, wholesale prices have been consistently higher than farm prices, which in turn indicates that the emerging system is transmitting to a greater extent the real costs of distribution. The increase in the wholesale to farm price spread has been the smallest for wheat, reflecting the stronger jump in farm price levels for that crop as shown in Figure 4.

In the case of rice, the wholesale to farm price ratio has followed a totally different path. The spread has been much larger and has fluctuated less than for the other two crops. It also displays a sustained downward trend over a nearly ten-year period, after an initial peak around 1979/80. Shortly before the reforms in the rice sector took place, wholesale prices had fallen to 50 percent of the farm price levels. A huge hike in the spread took place in 1988, taking wholesale prices to twice the level of farm prices. This spread is unusually large and is likely to narrow as adjustments to the reform measures in the distribution and processing sector proceed. In particular, the liberalization of the distribution and export sectors should lead to a reduction of the huge gap between farm and export prices shown in Figure 3.

The changes in temporal and spatial price spreads are presented in Tables 4, 5, and 6. The wedge between seasonally highest and lowest prices has decreased during the reform period for wholesale and urban retail prices but has increased for rural prices. Further study of the process of price formation and of the changes in local procurement activities in rural markets should provide insights into the observed differences in price adjustments. Regarding spatial price spreads, the numbers in table 6 show slightly falling

margins for wheat and maize, but strong increases for rice. The figures also show a decrease in the degree of variability of foodgrain prices across governorates, probably indicating a trend towards improved linkages among local food grain markets.

With the exception of rice, the preceding discussion would indicate that the liberalization of the foodgrain distribution systems has not impacted negatively on consumers, since the marketing-cost-related price spreads have remained within their historical range. This fact is important, considering the reduction in consumer price subsidies that has accompanied the reform of the foodgrain distribution system.

The summary of the changes in the levels and variability of foodgrain consumer (wholesale and retail) prices presented in Table 4 allows a fuller appreciation of the adjustment process on the consumption side of the pricing system<sup>9</sup>. The figures show declining trends for all foodgrain prices during the reform period, except for wheat wholesale and urban retail prices. Even in these cases, the rate of consumer price increases has slowed down significantly in the second compared to the first (pre-reform) period. In all other cases, the reforms have been accompanied by a reversal of rising consumer price trends during the latter period. Rural retail prices for rice are the only exception, in the sense that they fell much faster during the pre-reform period.

The remainder of the table compares price variability levels before and after the reforms,

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<sup>9</sup> For rice, the figures cover only the first full year after the reforms, permitting observation of only the earliest adjustments in prices.

**Figure 3--Ratio between real world and domestic foodgrain prices**

**Figure 4--Nominal farm prices deflated by CPI (1987=100)**

whereby the standard deviation of the percent variation of monthly prices from their trend value is used as a variability indicator. Both inter-year and intra-year variability levels are estimated. In both cases, variability levels have been decreasing during the reform period (period 2), with a few exceptions. Only rice wholesale and rural retail prices have shown increased instability levels. However, the calculations cover only one year after the reform of the rice sector and may reflect the very first adjustment attempts in the distribution system. Otherwise, the figures strongly suggest that the reform process is associated with higher stability levels in foodgrain markets. It would therefore appear that the reform process has brought about increased mobility over time and across space in foodgrain markets through a more responsive distribution system.

The preceding discussion indicates consumers have benefitted from the initiated reforms due to lower and more stable foodgrain prices. This would imply improved access to foodgrains by consumers and constitute an important contribution to the food security objective in Egypt. The changes in the foodgrain marketing and processing systems underlying the changes discussed in the preceding sections are now examined below. For reasons of data availability, the analysis will focus heavily on the rice sector.

**Farm Level Responses.** The first point of interest at the farm level is the extent to which farmers have changed their marketing behavior following the changes in the foodgrain marketing policy and regulatory framework. Table 5 shows how three categories of farmers surveyed between 1990 and 1992 have reacted to changes in the procurement system in terms of i) total quantities marketed and ii) the share of quantities marketed through private channels. For the entire sample, the share of marketed surplus (private sales plus public delivery) rose from 60 to 75 percent between 1990 and 1992. Most of that change, however, took place among farmers with holdings of 5 or more feddans. The share of marketed surplus, the sum of private and public delivery, has hardly changed among the smaller sized holdings. For holdings of sizes less than 1 feddan, average

marketed surplus remained around the low 40 percent, whereas for those between 1 and 5 feddans, it lay around 70 percent. On the other hand, marketed surplus for farms larger than 5 feddans went up by nearly 10 percentage points to 87 percent

It is interesting to note that quantities marketed by the smallest farms in the last two years are less than that of the first year. Figures for earlier years not being available, it is difficult to say whether or not there has been a real decline in marketed quantities among that category of farmers following the reforms. However, the concomittantly strong increase in intra-household (own use) quantities and the decrease in public deliveries suggest that marketed surplus has declined<sup>10</sup>. It appears that small farmers had been operating under some pressure to cut on own consumption to satisfy the delivery targets set in the former procurement system and are now reacting to the deregulation of the marketing system by keeping larger shares of production.

Moreover, the distribution of sales between private and public channels has changed rather dramatically across the different categories of farmers. Small farmers with holdings of less than 1 feddan in size show the strongest reaction in terms of shifting away from the public delivery system. Whereas for the entire sample the share of private sales jumped from 20 to 50 percent, the share of public delivery in total sales for the latter decreased by 75 percent, while their sales through private channels tripled, just two years into the reforms.

**Table 4--Real price trends and variability before and after market reforms**

	Wheat	Maize	Rice
Wholesale Prices			
Real rate of increase (%)			
Both periods	1.3	-0.3	2.5
Period 1	9.5	0.6	0.1
Period 2	2.9	-4.2	-4.5

<sup>10</sup> The 40-44 percent share of marketed quantities by these farms lies well below the average 50 percent share of public deliveries during the pre-reform era, indicating that there has been probably a decline in the share of marketed surplus among smaller farms.

Inter-year Variability			
Both periods (%)	21.2	15.9	162.5
Period 2 / Period 1	0.6	0.6	0.1
Intra-year Variability			
Both periods (%)	7.3	7.5	6.0
Period 2 / Period 1	0.8	0.7	3.1
Urban Retail Prices			
Real rate of increase (%)			
Both periods	2.8	-1.0	n.a.
Period 1	6.1	3.6	n.a.
Period 2	1.0	-5.2	n.a.
Inter-year Variability			
Both periods (%)	70.0	51.0	n.a.
Period 2 / Period 1	0.7	1.1	n.a.
Rural Retail Prices			
Real rate of increase (%)			
Both periods	2.8	-0.3	1.9
Period 1	7.4	3.3	-4.5
Period 2	-0.2	-3.9	-2.5
Intra-year Variability			
Both periods (%)	8.0	7.5	7.8
Period 2 / Period 1	0.7	0.8	0.3

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Source: Based on unpublished CAPMAS data collected by staff at MARL. Rates of increase and variability indicators are based on monthly data for the period 1976-1992 for wholesale and urban retail prices and for the period 1982-1992 for rural retail prices. For wheat, period 1 is 1976-1986 and period 2 is 1987-1992. For maize, period 1 is 1976-1985 and period 2 is 1986-1992. For rice, period 1 is 1976-1990 and period 2 is 1991-1992. n.a. indicates that complete urban retail price data were not available for rice.

**Figure 5--Ratio of wholesale to farm prices**

**Table 5--Rice utilization and marketing by different categories of farmers, 1990-1992**

	<1 Feddan			1-5 Feddan			>5 Feddan			All Sizes		
	1990	1991	1992	1990	1991	1992	1990	1991	1992	1990	1991	1992
	Percent											
In-kind wages	9	9	6	8	8	5	10	19	4	9	10	5
Private sales	11	29	33	33	33	45	43	25	57	21	29	50
Public delivery	40	11	11	37	33	24	35	42	30	38	20	25
Own use	39	52	51	21	25	25	12	14	9	33	41	20

Note: Based on data from ACP survey of 200 farmers in main rice producing governorates (Daqahilya, Behira, Kafr El Sheikh, Sharqiya) November 1991 and December 1992.

Following restrictions prevailed in 1990: Quota delivery of 1.0 ton/feddar; possession, storage, milling, transport, and marketing of rice under government control. Restrictions were removed in 1991, but between 1/3 and 1/2 of farmers learned about their removal at planting time or later.

During the same period, the ratio of private sales to public delivery rose from 0.25 to 3.0. The other two categories of farmers were still marketing about 35 percent of their excess output through the public system. Most of the increase in private sales by large farms comes from reduced on-farm use, leaving the share of public deliveries in their total sales almost unchanged. The relatively large share of public deliveries in sales by large farmers may be linked to the scale of their surplus quantities and to potential limitations in the procurement capacity by private traders.

The stagnation of the marketed surplus by small farmers indicates that they may be lagging behind in terms of output response and in all probability are not gaining from eventual improvements in the marketing system. There are many factors related to the reforms of the distribution system and that may affect the level of marketed surplus by small farmers. These include access to marketing services, the cost of marketing to small farmers, as well as price differences across local markets and between the public and

private procurement systems. The role of these individual factors needs to be better understood, in order to help small farmers maximize their gains from the marketing reform programs.

As expected, the reaction in farmers' marketing behavior is also affected by locational factors, as can be seen in Table 6. The table shows the distribution of marketed surplus in the main rice producing governorates during the first two years of the reforms. Farmers in Daqahliya and, to a lesser extent, Behira and Sharqiya show a strong reduction in public sales in favor of private sales in local markets. However, public deliveries still accounted for the bulk of farm sales in Behira and were even slightly increasing in Kafr El Sheikh. The high public sector sales in Behira may be related to the proximity to the public sector milling and exporting facilities in Alexandria. The increasing public sector sales in Kafr El Sheikh, on the other hand, could be explained by the scale of surplus quantities as suggested by the very high self-sufficiency ratio which exceeds 500 percent. The same reason may also underlie the increase in the share of sales to private mills observed only in that governorate.

The changes recorded in Table 7 with respect to the ratio between private and public sales prices and the share of public deliveries show that farmers are shifting to private markets in response to rising and now more favorable prices in these markets. As one would expect, the reaction of farmers seems to be stronger the larger the increase in the ratio of private to public prices. The only case where the price ratio has changed in favor of public deliveries is observed in Kafr El Sheikh markets for Philippini rice. The high level of surplus output in that governorate and the fact that Philippini rice is not the variety preferred by consumers may explain the plunge in private market prices and the concomitant rise in public sector deliveries.

More detailed information about the differences in marketing strategies is presented

in Tables 8 and 9 which summarize marketing channels used by different categories of farmers and in individual governorates in 1992. Larger farms and farmers in Behira and Kafr El Sheikh sell relatively less to private traders. They also sell more to mills in general and to public mills in particular. Furthermore, the share of public sales in total sales increases with the size of farm holdings, whereas farmer sales to private mills are observed only in kafr El Sheikh (Table 8). Direct sales to consumers have become negligible and observed only for intermediate-size farms and in Daqahliya, despite the strong increase in private sales shown in Table 5.

**Table 6--Distribution of marketed surplus in selected govenorates, 1991-1992**

	Daqahliya		Behira		Kafr El Sheikh		Sharqiya	
	1991	1992	1991	1992	1991	1992	1991	1992
Average production (ton) <sup>1)</sup>	7	5	8	8	7	5	8	6
Average marketed surplus (ton) <sup>1)</sup>	3	3	6	6	3	3	7	3
Share in marketed surplus								
local markets (%)	32	83	24	33	69	49	55	66
private mills (%)	--	--	0	0	0	13	0	0
public delivery (%)	67	17	76	67	31	38	45	34

Note: Based on data from APCP survey of 200 farmers in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh, and Sharqiya). November 1991 and December 1992.

<sup>1)</sup> Quantities are averages per surveyed farm.

The final aspect of farm-level adjustment to market reforms to be discussed is with respect to the level of farmer participation in individual marketing and processing activities. Despite lower output levels, the share of marketed surplus has increased in 1992 in all governorates except in Sharqiya (Table 10). Similarly, the share of farmers reporting foodgrain sales has risen in three of the four governorates. In contrast, farmers

store less grains for later sales and in two of the four governorates, the share of farmers reporting foodgrain stocks has declined. In the case of the other two governorates, the increase in the number of farmers reporting foodgrain stocks is associated with increasing consumption stocks, while sales stocks have fallen at the same time.

Although average quantities milled per farm have hardly changed, the level of farmer participation in milling activities has also declined in 1992, except in Sharqiya. Furthermore, the figures show a reduction in the share of output processed on-farm in two of the governorates. In contrast, on-farm milling activities have increased in Kafr El Sheikh, probably due to the high surplus levels observed in that governorate.

The data presented above should be interpreted with caution since the period covered by the available data does not go much beyond the first two seasons after the introduction of reforms in the rice sector. However, this limitation should not affect the strong differences that are observed in the adjustment in marketing strategies across farm size and between regions. A more systematic analysis of these differences needs to be undertaken for a better understanding of the determinants of marketing behavior and its implications for the objective of increased private sector participation in local foodgrain marketing.

**Domestic Trading.** The objective of the liberalization of output markets is to encourage private participation in the distribution of foodgrains. Given the lack of information on the operation of private traders before the adoption of reforms, it is rather difficult to retrace changes in their level of participation. The discussion in this section focuses therefore on the level of private participation and the structure of trading activities in the emerging private sector. The data used are from 1992, the first year after the initiation of reforms.

**Table 7--Prices received by farmers and public sales in selected governorates, 1991-1992**

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Variety/ Governorate	Average Free Market Price		Change 1992/91	Average Public Procurement Price		Change 1992/91	Share of Public Sales		Change 1992/91
	1991	1992		1991	1992		1991	1992	
	LE/Ton	LE/Ton	percent	LE/Ton	LE/Ton	Percent	Percent		
Japonica	403	423	5	403	402	-0.2	34	23	-32
Daqahliya	399	403	1	402	400	-0.5	69	25	-64
Behira	400	406	2	404	401	-0.7	75	61	-19
Kafr									
El Sheikh	410	452	10	400	--	n.a.	26	--	-100
Sharqiya	406	434	7	404	406	0.5	36	18	-50
Philippini	400	389	-3	402	368	-8	58	58	0
Daqahliya	--	--	--	--	--	--	--	--	--
Behira	--	395	n.a.	404	357	-12	100	89	-11
Kafr									
El Sheikh	404	380	-6	400	395	-1	44	50	14
Sharqiya	--	--	--	405	--	n.a.	100	--	-100

Note: Based on data from APCP survey of 200 farmers in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh, Sharqiya) November 1991 and December 1992.

-- no sales reported

n.a. not applicable

**Table 8--Marketing channels used by different categories of farmers, 1992**

Channel	<1 Feddan	1-5 Feddan	>5 Feddan	All sizes
	Percent			
Private traders	72	53	56	57
local village	49	32	28	31
other village	21	19	28	25
urban traders	2	2	0	1
Rice mills <sup>1)</sup>	5	16	11	11
small private	0	6	0	1
large private	0	0	5	3
public mills	5	10	6	7
Public delivery	23	29	34	32
Direct consumer sales	0	2	0	--

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh and Sharqiya), January-March 1993.

<sup>1)</sup> Large (small) mills have capacity greater (less) than 100t/month.

-- less than 1%

**Table 9--Rice marketing by farmers in selected governorates, 1992**

Channel	Daqahliya	Behira	Kafr El Sheikh	Sharqiya	All Sample
	Percent				
Private traders	82	38	48	66	57
local village	55	6	22	54	31
other village	27	30	26	12	25
urban traders	0	2	0	0	1
Rice mills <sup>1)</sup>	--	11	33	0	11
small private	--	0	5	0	1
large private	0	0	15	0	3
public mills	0	11	13	0	7
Public delivery	16	50	18	34	32
Direct consumer sales	2	0	0	0	--

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh and Sharqiya), January-March 1993.

<sup>1)</sup> Large (small) mills have capacity greater (less) than 100t/month.

-- less than 1%

The level of private sector participation in the main rice producing governorates and for different categories of traders is presented in Tables 11 and 12. The first table shows the levels and distribution of procurement and sales activities by foodgrain retail and wholesale traders in the rural and urban areas of the four governorates. The reported figures refer to the survey period and show that traders procure paddy almost exclusively from local farmers, as would be expected in high surplus areas. More surprising, however, is that a significantly high share of paddy sales by private traders are also concentrated on local markets. Since these are major producing areas, one would have expected more "exporting" activities by private traders into other governorates. The strong local orientation of marketing activities may indicate that private traders are having difficulties establishing long distance trading networks or that incentives to invest therein

are not available. The latter hypothesis is less probable to hold in the context of liberalized domestic markets, given the heavy concentration of rice production in these four governorates.

The figures also reveal that private traders operate predominantly in paddy markets, even in the case of urban wholesalers. With the exception of the latter, white rice purchases by private traders are still negligible. The considerably larger sales quantities of white rice and the significant differences between paddy procurement and sales (Table 12) suggest high levels of milling activities among private traders. It can be observed from the summary of milling activities in Tables 13 and 14 that traders still use small local village millers almost exclusively. Only urban retailers use small urban mills but for less than one third of the milling quantities. There are however marked differences in trader milling activities across individual governorates, as illustrated by the figures in Table 14. Traders in Kafr El Sheikh use local small urban mills for close to half of their milling activities.

**Table 10--Participation in marketing and processing activities by farmers in selected governorates**

	Daqahliya		Behira		Kafr El Sheikh		Sharqiya	
	1991	1992	1991	1992	1991	1992	1991	1992
Average production (ton) <sup>1)</sup>	7	5	8	8	7	5	8	6
Average marketed surplus (%)	50	60	76	74	50	51	87	54
Sales to local markets (ton)	1	2	1	2	2	1	4	2
Share in marketed surplus (%)	32	83	24	32	69	62	55	66
Share of farmers (%) <sup>2)</sup>	70	56	50	64	53	77	54	88
Storage of paddy rice (ton)	2	1	2	0.5	3	2	4	3
For consumption (%)	100	100	43	60	28	45	26	31
For sale (%)	0	0	57	40	72	55	74	69
Share of farmers (%) <sup>2)</sup>	96	90	100	43	76	86	86	95
Milling of paddy rice (ton)	2	1	0.5	0.5	0.5	0.7	0.3	0.3
Share of output (%)	24	20	6	6	7	14	5	4

Share of farmers (%) <sup>2)</sup>	97	93	100	74	89	86	83	95
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Note: Based on data from APCP survey of 200 farmers in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh, and Sharqiya). November 1991 and December 1992.

<sup>1)</sup> Quantities are averages per farmer

<sup>2)</sup> Share of farmers reporting the corresponding activity

In contrast, traders in Behira use a large share of larger mills. They also use their own mills for more than one third of their milling activities. This is the only example in the entire sample, where traders have invested in milling capacities. The use of large and own mills in Behira may explain the 40 to 50 percent higher milling cost in that governorate. Differences in post reform trader marketing behavior could also be observed across individual foodgrains, as shown by the results of a rapid survey of selected local markets around Cairo carried out under the present study<sup>11</sup>.

**Table 11--Participation of different types of traders in rice marketing, 1992**

Procurement source/ sales location	Rural		Urban	
	Retailers	Wholesalers	Retailers	Wholesalers
Paddy procurement (ton/trader)	55	157	55	133
local farmers (%)	97	95	89	98
other farmers (%)	1	1	2	2
government (%)	2	5	9	0
Paddy sales (ton/trader)	31	102	36	75
Intragovernorate (%)	65	77	70	45
Intergovernorate (%)	35	23	30	55
White rice procurement (ton/trader)	--	--	1	20
local farmers (%)	31	0	21	89
local traders/mills (%)	32	0	33	6
others (%)	37	100	46	5
White rice sale (ton/trader)	8	17	11	40
Intragovernorate (%)	73	80	64	88
Intergovernorate (%)	28	20	36	12

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya,

<sup>11</sup> The survey was carried out in November and December 1993 and has included traders from selected markets in Cairo, Giza and Kalubiya governorates (see Badr 1994).

Behira, Kafr El Sheikh and Sharqiya), January-March 1993.  
 -- less than 1 ton

**Table 12--Paddy procurement and sale by private traders in selected Governorates, 1992**

Procurement source sales location	Daqahliya	Behira	Kafr El Sheikh	Sharqiya
Paddy procurement (ton/trader) <sup>1)</sup>	87	52	85	56
local farmers (%)	97	95	99	83
other farmers (%)	0	4	--	2
government (%)	3	1	--	5
Paddy sales (ton/trader) <sup>1)</sup>	43	38	58	30
intragovernorate (%)	56	68	74	78
intergovernorate (%)	44	32	26	22

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh and Sharqiya), January-March 1993.

<sup>1)</sup> Average per trader

-- less than 1

**Table 13--Milling activities by categories of private traders, 1992**

	Rural		Urban	
	Retailers	Wholesalers	Retailers	Wholesalers
Paddy milled (ton) <sup>1</sup>	12	25	16	30
Milling ratio (%)	67	68	67	67
Milling cost (LE/ton)	20	19	18	17
Type of mill used				
large private (%)	6	0	0	0
small private (%)	93	100	89	100
own (%)	1	0	11	0

Location of mill				
local village (%)	98	9	41	62
other village (%)	2	91	28	38
local city (%)	0	0	31	0

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh and Sharqiya), January-March 1993.

<sup>1)</sup> Average per trader

Large (small) mills are defined as having a milling capacity of more (less) than 100 t/month.

**Table 14--Milling activities by private traders in selected governorates, 1992**

	Daqahliya	Behira	Kafr El Sheikh	Sharqiya
Paddy milled (ton) <sup>1</sup>	26	18	8	14
Milling cost (LE/ton)	18	24	17	17
Type of mill				
large private (%)	1	33	0	0
small private (%)	99	32	100	100
own (%)	0.00	35	0	0
Location of mill				
local village (%)	80	80	56	41
other village (%)	19	9	0	59
local city (%)	1	11	44	0

Note: Based on data from APCP survey of 160 rice traders in main rice producing governorates (Daqahliya, Behira, Kafr El Sheikh and Sharqiya), January-March 1993.

<sup>1)</sup> average per trader

Large (small) mills are defined as having a milling capacity of more (less) than 100 t/month.

The results reported in Table 15 indicate most of the foodgrain traders who have started their business during the last three years have chosen to specialize in rice trading. The wheat and maize sectors have hardly attracted new entrants. Furthermore, average

marketed quantities per trader have declined for both wheat and maize, except in Kalubiya markets (Table 16). Marketed rice quantities have, in contrast, risen up very rapidly, suggesting a diversion of activities towards rice marketing. The sharp decline in average marketed quantities for wheat and the increase for rice are both in line with the overall trends in relative private sector share in both markets, as illustrated in Table 17.

Without detailed and accurate data on marketing costs and margins, it is quite difficult to get to the root of the governorate, trader, or crop-specific differences pointed out above. The lack of accurate information at this level also makes it impossible to examine the changes in costs and the efficiency of local market operations. This constitutes a big gap in the efforts currently underway to monitor and guide the reform process, the ultimate objective of which is to cut the costs associated with the movement of commodities on local markets and raise the efficiency of domestic marketing systems.

**The Milling Sector.** Millers are the third major group of participants in the foodgrain distribution system whose operations had been severely restricted under the pre-reform regulatory framework. Unlike the farmer and trader sectors, Egypt's milling sector is characterized by a dualistic structure, with on the one hand the large-capacity, technologically-modern, public sector and, on the other hand, the private sector with much smaller capacity and less advanced technologies. The technological dualism, particularly in the rice processing industry has far reaching implications for the adjustment process in the private milling sector. The resulting technological edge in the public milling sector is very likely to retard the take over process by the private sector. The latter may lack the capital to acquire new and superior technologies or to take over existing public companies, which are entirely based on very expensive production techniques.

**Table 15--New trader entry in selected local grain markets**

Governorate	Years of Experience											
	Wheat				Maize				Rice			
	>5	3-5	1-3	<1	>5	3-5	1-3	<1	>5	3-5	1-3	<1
Share of Traders												
Cairo	91	0	9	0	100	0	0	0	0	0	97	3
Giza	84	16	0	0	77	23	0	0	24	29	12	35
Kalubiya	50	43	0	7	50	42	4	4	43	32	25	0
All	75	22	1	2	76	22	1	1	22	22	37	19

Source: IFPRI food grain market survey, November-December 1993

**Table 16--Average monthly foodgrains transactions per trader, 1990 and 1993**

Governorate	Wheat			Maize			Rice		
	1990	1993	Change %	1990	1993	Change %	1990	1993	Change %
Cairo	5.73	3.03	-47	13.11	11.06	-16	0	40.90	n.a.
Giza	1.67	0.67	-60	9.40	6.86	-27	0.20	1.91	835
Kaluhia	0.68	0.73	7	1.19	1.19	0	0.93	1.48	60

Source: IFPRI Foodgrain Marketing Survey, November-December, 1993.

**Table 17--Public procurement of wheat and rice, 1990-1992**

Year	Total Production (1000 ton)	Procurement (1000 ton)	Share (%)
1976/89	2,187	1,105	47
1989/90	2,676	1,131	42
1990/91	3,166	1,021	32
1991/92	3,446	885	26

			Wheat
1981/89	2,297	130	7
1989/90	4268	560	13
1990/91	4483	530	12
1991/92	4618	750	16

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Source: El Amir and Gamal El Din, 1994b; page 8.  
Annual Report on Rice crop in Egypt, Holding Company For Rice milling and marketing, 1991/92, p.6.

The example of the rice sector is used to examine the process of adjustment in the foodgrain milling sector. Table 18 presents the changes in the procurement activities of a sample of 160 millers surveyed between 1991 and 1992. The figures in the first row of the table display the considerable difference in available capacities between the public and private sector. The average quantities procured by public mills in 1992 were back to their 1990 levels after a sharp drop in 1991. In contrast, large private mills, which are defined as mills with a processing capacity of at least 100 tons per month, procured on average one third of their 1990 quantities, close to average quantities in the small scale milling sector. The changes in the procurement sources highlight some of the reasons for these developments. In 1990, both public and large commercial mills received the bulk of their paddy procurement, 83 and 59 percent respectively, through public channels from the Ministry of Supply. In 1992, both procured 3/4 of their quantities directly from farmers. The large scale private sector may have been having difficulties getting into farm-level procurement after the strong restrictions it has been subjected to in this area have been lifted. The increase in the share of farm-level sources in procurement by millers is accompanied by higher levels of direct intragovernorate purchases, particularly by public mills. Nevertheless, the share of quantities procured directly (not through the Ministry of Supply) across governorates shows an increasing trend. Large private mills which procured previously only through the Ministry or from local sources had an

intergovernorate procurement share of 13 percent already in 1992.

Common to both public and private millers is the fact that they hardly use private traders in their procurement activities. It has been observed also in the preceding section that traders hardly purchased white rice from millers. It would seem therefore that the reform process has not yet triggered a specialization progress between trading and milling subsectors. The extent to which millers are involved in marketing activities is shown in Table 19. The share of millers engaged in procurement and sales activities and the average quantities traded have increased for all three categories of mills. The large drop in sales by public mills in 1992 is caused by the creation of the Public Holding for Rice Mills and Marketing a year earlier to take over the responsibility for white rice marketing<sup>12</sup>.

A critical aspect of the adjustment process in the processing industry is how performance by domestic mills is being affected. According to the figures in Table 20 the number of public mills has decreased slightly whereas that of large private mills rose significantly during 1992. At the same time, average milling capacities expanded in the public sector but remained almost unchanged in the private sector. The ratio of capacity utilization has, however, fallen rather sharply compared to 1990, despite a slight recovery in 1992 in the public sector.

Key indicators of the performance of the processing industry are the unit costs of milling. The numbers shown in the table point to rapidly converging costs between the public and private sector. These figures are reported costs by millers in the surveyed sample and may not be an accurate reflection of cost structures in the industry. Nevertheless the suggested convergence in milling costs should be expected.

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<sup>12</sup> The creation of the Holding company is seen as first step in taking the milling and marketing activities out of the direct control of the Ministry of Supply and eventually prepare their privatization.

**Table 18--Paddy procurement by public and private mills, 1990-1992**

Source	Public Mills			Large Private Mills <sup>1)</sup>			Small Private Mills <sup>1)</sup>		
	1990	1991	1992	1990	1991	1992	1990	1991	1992
Total (1000t) <sup>2)</sup>	26	12	26	1	0.4	0.3	0.2	0.2	0.2
Farmers (%)	17	21	75	28	72	79	99	89	87
Wholesalers (%)	0	50	20	9	15	16	--	7	5
Retailers (%)	0	6	3	4	13	5	--	4	8
Same Governorate (%)	8	69	63	41	100	87	100	100	100
Farmers (%)	8	17	55	28	72	66	99	89	87
Wholesalers (%)	0	47	7	9	15	16	--	7	5
Retailers (%)	0	5	1	4	13	5	--	4	8
Other Governorates (%)	9	7	35	0	0	13	0	0	0
Farmers (%)	9	4	20	0	0	13	0	0	0
Wholesalers (%)	0	3	13	0	0	0	0	0	0
Retailers (%)	0	1	2	0	0	0	0	0	0
Ministry of Supply %	83	23	2	59	0	0	0	0	0

Note: Based on data from APCP survey, November 1991 and January-February 1993.

<sup>1)</sup> Large (small) mills have capacity greater (less) than 100 tons/month; (see table F for sample size).

<sup>2)</sup> Figures are averages per surveyed mill.

-- less than 1%.

Equally important from the point of view of the adjustment process are the changes in the relative shares of the individual categories of millers. The last two rows of the table indicate that public mills are losing out in terms of overall capacities, due primarily to the strong expansion among large private mills, as shown in the top row. In terms of milled quantities, however, they still play a predominant and increasing role in the processing industry. Small private mills, on the other hand, are losing market shares quite rapidly. This could have serious implications for the operations of private traders, of whom more than 90 percent and more process through small private mills. The high and

increasing share of public mills also implies that average milling costs in the rice industry will drop less rapidly than they would with a larger share of private, lower-cost, millers.

Another important change in the milling industry is the adjustment in the seasonal distribution of milling activities. Milling periods were strictly regulated before the reforms. Millers have expectedly reacted to the elimination of milling restrictions by having a more balanced distribution of operations over time, as can be seen from the figures in Table 21. Compared to the pre-reform period, about half of the millers surveyed started the milling season earlier. Albeit to a lesser extent, a larger number of mills also operated during the last months of the milling season (2 percent). The reduced concentration of milling activities over time means reduced seasonal pressure on rice prices, to the extent that it induces a more even distribution of market sales of milled rice as well as procurement of paddy.

**Table 19--Participation of millers in rice marketing, 1990-1992**

Activities	Public Mills			Large Private Mills			Small Private Mills		
	1990	1991	1992	1990	1991	1992	1990	1991	1992
	Share of participating mills %								
Procurement <sup>1)</sup>	54 (30509)	100 (7274)	100 (26375)	0 0	56 (518)	30 (574)	0 0	2 (27)	60 (56)
Sales	54 (22087)	100 (5194)	7 (430) <sup>2)</sup>	0 0	56 (378)	22 (404)	0 0	2 (26)	2 (140)
Storage <sup>3)</sup>	100 (9558)	100 (17432)	57 (19716)	11 (500)	44 (1635)	22 (243)	0 0	2 (30)	6 (15)

Note: Based on APCP survey data, November 1991 and January-February 1993.

Large (small) mills have capacity greater (less) than 100 tons/month; (see table F for sample size).

-- less than 1%.

na: not applicable

<sup>1)</sup> Figures in parentheses are average quantities procured in tons of paddy equivalents per mill.

<sup>2)</sup> Only paddy sales. White rice sold through the Rice Marketing Company, owned by the newly created

Holding Company for Rice Mills and Marketing.

Figures in parenthesis give the percentage share of millers participating in the corresponding activity.

<sup>3)</sup> Storage capacity; 1992 figures refer to actual storage levels.

**The Export Sector.** The last major group of foodgrain market operators to be discussed is that of rice exporters. Prior to the reforms, rice was exported exclusively through public companies and under extensive controls through the Rice Export Committee. As a result of prevailing export regulations and the myriad of other restrictions in the rice sector discussed earlier, exports fell gradually to as low as 25 percent of their level of the late sixties by the inception of reforms. Just after the reforms, private sector participation in rice exports rose to nearly 10 percent of total exports (Table 22). Data reported by the Holding Company for Rice Mills and Marketing indicate that the share of private sector exports has further expanded to more than 40 percent. Currently, however, private exporters concentrate more on the closer African and Middle Eastern export markets, where they sell more than 87 percent of their exports, compared to only 61 percent by public companies<sup>13</sup>. Table 22 illustrates another interesting change in the export sector, namely the shift by public companies away from the usual barter contracts of the intervention era to exclusively free export sales.

The future of rice exports in Egypt will depend very much on the performance of the emerging private export sector. There are, however, two potential threats to the future competitiveness of that sector. The first threat comes from existing restrictions still facing both private and public exporters. The last row of Table 22 shows that Export Committee. This is a drop by 50 percent from the previous year when 100 percent of exporting companies reported restrictions to their operations. The role of the Export Committee in the context of liberalized export regimes needs serious attention. The other

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<sup>13</sup> Cited in MALR / APCP (1994), Tranche VI Report, Annex II; page 29, table 2.25.

likely source of problem for the competitiveness of private exports arises from the dualistic structure of the milling industry pointed out earlier. The private milling sector lacks the appropriate technologies to process high quality rice for exports. Consequently, private exporters have to rely on public mills. The current cost structure in the public milling industry is very high, averaging nearly 25 percent of the final cost of white rice<sup>14</sup>. Milling costs in the public sector are already decreasing, as shown in the preceding section. However, until improved processing technologies are available to the lower-cost private milling sector, costs in the public sector will have to decline much further in order not to jeopardize the competitiveness of the export industry. The other factor that may be determining for the future of rice exports from Egypt is the ability of emerging exporters and the government to develop new export outlets for the Philippini rice variety, which is not appreciated in Egypt's traditional rice export markets.

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<sup>14</sup> See El Amir and El Din, 1994b; p.2.

**Table 20--Performance of public and private mills, 1990-1992**

	Public Mills			Large Private Mills			Small Private Mills		
	1990	1991	1992	1990	1991	1992	1990	1991	1992
Estimated total number	52	52	47	37	37	335	1609	1609	1700
Sample size	13	11	14	9	9	23	84	84	85
Actual capacity (1000t) <sup>1)</sup>	34	23	41	2	1	2	0.5	0.5	0.6
Utilization ratio (%)	77	52	63	48	40	20	50	37	28
Milling ratio	70	72	70	66	68	66	65	65	67
Milling cost (LE/ton) <sup>2)</sup>	89	80	32	14	21	18	16	17	21
Paddy milled (1000t) <sup>1)</sup>	26	12	26	0.9	0.5	0.3	0.2	0.2	0.2
Total shares in milling capacity (%)	94 (69)	93 (60)	95 (40)	5 (3)	5 (2)	4 (24)	1 (28)	2 (38)	1 (36)
Total share in quantity milled (%)	79	68	94	2	2	2	19	30	4

Note: Based on data from APCP survey, November 1991 and January-February 1993.

Large (small) mills have capacity greater (less) than 100 tons/month; (see table F for sample size).

<sup>1)</sup> Figures are annual averages per surveyed mill.

<sup>2)</sup> Cost of milling and polishing.

<sup>3)</sup> Shares apply to the surveyed sample. For comparison, overall shares are included in parenthesis.

**Table 21--Seasonal patterns in rice processing, 1990-1992**

Month	Public Mills			Large Private Mills			Small Private Mills		
	1990	1991	1992	1990	1991	1992	1990	1991	1992
	Share of operating mills								
September	85	18	71	11	--	48	52	18	41
October	23	45	93	11	22	74	37	27	76
November	61	55	100	78	66	100	54	96	100
December	85	82	100	78	100	100	56	100	100
January	100	91	100	78	100	100	74	100	100
February	100	100	100	78	100	100	90	100	100
March	100	100	100	78	88	87	93	95	93
April	100	91	100	44	44	83	83	35	83
May	100	91	100	33	22	70	79	19	63
June	77	82	100	33	11	70	70	19	63
July	54	55	7	33	--	56	69	19	52

August                      38<sup>1)</sup>    36<sup>2)</sup>    7<sup>3)</sup>                      33<sup>1)</sup>    --<sup>2)</sup>    52<sup>3)</sup>                      62<sup>1)</sup>    19<sup>2)</sup>    43<sup>3)</sup>

Note: Based on data from APCP Survey, November 1991 and January-February 1993.

Large (small) mills have capacity greater (less) than 100 tons/month.

-- less than 1%.

<sup>1)</sup> August 1990.

<sup>2)</sup> August 1991.

<sup>3)</sup> August 1993.

**Table 22--Private sector participation in rice exports, 1991-1992**

	Public Companies		Change	Private Exporters		Change
	1991/92	1992/93	%	1991/92	1992/93	%
Total exports (1000t)	117	52	-56	12	36	200
Relative Share (percent)	91	59	-35	9	41	356
Free exports (1000t) <sup>1)</sup>	82	52	-37	12	36	200
Share of total (percent)	70	100	43	100	100	0
Share of firms reporting restrictions	100	50	-50	100	50	-50

Note: Based on APCP survey of three (four) private and four (six) public exporting companies in April 1992 (February-March 1993), and data from the Holding Company for Rice Mills and Marketing, cited in MARL/APCP Tranche VI Report, Annex II, page 29.

<sup>1)</sup> Remaining quantities are commodity exchange agreement and other barter deals.

### Summary of Major Findings

Even though it is primarily based on data from the rice sector, the preceding analysis indicates that the foodgrain economy is adjusting to the changes in the policy and regulatory framework of domestic markets. First, farmers are reacting with higher output levels and marketed surplus. Both average quantities marketed per farmer and the share of farmers reporting sales show increasing trends. Similarly, average direct sales as well as milling and storage activities for sales purposes by farmers have decreased, indicating a growing reliance on their part on the emerging intermediation system for their

marketing needs. Furthermore, rice deliveries to the public procurement system are declining, although their levels are still substantial. Wheat deliveries in contrast exhibit increasing trends.

Even though average marketed surplus has been increasing, the bulk of the expansion has taken place among farms larger than 5 feddans. Marketed surplus among smaller sized farms has hardly changed. The stagnation of the marketed surplus by small farmers raises concerns in terms of their benefiting from the reform process.

Furthermore, large farmers across all crops still market both absolutely and relatively significant shares of their output through the public procurement system. Could this be a reflection of capacity constraints within the emerging private sector? Strong differences in marketing behavior were also observed across individual governorates.

Concomitant to changes in output levels and marketing behavior are falling real farm foodgrain prices, except for wheat. At the same time, real farm wages and real fertilizer prices have also declined, offsetting some of the effect of falling output prices. Combined with the strong increase in output levels, this would suggest that farmers are gaining from the reforms, to the extent that changes in the other cost elements (land and equipment) do not exceed these gains.

Second, the reforms have brought about increased private sector participation in the distribution of foodgrains. However, the level of participation is significant only in terms of local trading. Private traders seem still hesitant to engage in distant and intergovernorate trading. Nevertheless, the adjustment in the marketing sector is associated with increased stability in local markets. Furthermore, producer to consumer price spreads have not declined during reforms. In fact they have increased in the case of rice. Real consumer prices have, however, been declining, reflecting the fall in farm prices.

Another interesting feature of the adjustment process is the fact that millers still

procure paddy rice predominantly directly from farmers, as in the old system, and do not make significant use of the emerging intermediation system. On the other hand, traders purchase and process paddy rice instead of procuring white rice from millers. It would therefore appear that operators in the two subsectors are not taking enough advantage of the reforms by specializing in their respective activities.

Third, the example of the rice sector indicates that private sector participation in the processing industry has increased in terms of milling capacity, due primarily to the large increase in the number of larger private sector mills. In terms of milled quantities, however, public millers still process the bulk of the output, and have even raised their milling share. In contrast, small private mills are losing market share, mainly from lower average milling quantities per mill. Furthermore, milling capacities have expanded both in the private and public sectors. At the same time, capacity utilization has declined rather rapidly in both sectors.

Millers have also responded to the reforms by extending the milling period, leading to a more even seasonal distribution of operations and less seasonal pressure on foodgrain prices. On the cost side, reforms have resulted in converging costs between the private and public sectors leading to lower total average costs in the milling industry.

Fourth, reforms have generated a strong increase in private rice exports, hitherto at the expense of public exports. One would, however, expect exports to start picking up, as private traders accumulate more experience in international markets and should the increase in output continue. At the same time, exports on the basis of barter contracts have disappeared in favor of free market exports, both for public as well as private exporters. Private exporters, however, still have to rely on public mills which have the adequate technologies to process high quality rice for export markets.

### **Policy Implications and Future Research Needs**

The foregoing analysis has revealed areas where the adopted reforms have not brought about the anticipated changes and which, consequently, call for greater attention in terms of furthering the reform process. There are five main areas to which this applies.

**Marketing Costs, Price Formation, and Performance of Local Foodgrain Markets.**

The data on farm prices for foodgrains showed a convergence of wheat and maize prices towards their international levels. Rice prices, on the other hand, are still significantly below international levels. Over the last two to three years, however, farm prices for all three foodgrains are showing downward trends. Moreover, the spread between farm and consumer prices, even though within historical bounds, has risen to the upper range for wheat and maize, whereas for rice, it has expanded rapidly. The above trend in prices deserves closer attention and might call for measures beyond the current system of floor pricing.

The widening gap could be a reflection of the cuts in consumer subsidies or of actual increases in costs of distribution associated with the emerging intermediation system. Another related question is the extent to which distribution costs have or could be decreased to absorb the pressure resulting from the elimination of consumer subsidies. In-depth study of i) the price formation process in local markets and ii) the structure and determinants of cost in the emerging marketing system can help to shed light on these issues. Of particular importance for the design of strategies to contain or reduce price spreads is the identification of the relative contribution of real increases in trader operating cost and that of other structural weaknesses in the emerging system to the change in price spreads.

Marketing costs and their determinants have not received enough attention in past foodgrain marketing research in Egypt. In fact, it has not been possible to come across any substantive information on costs either with respect to the public procurement system or for the private sector. The reduction of unit costs of distribution being a key objective

of market reforms, it is critical for the effective monitoring and successful implementation of these reforms to raise the level of knowledge about the structure and determinants of operating costs on local markets.

**Transition to Competitive Private-Sector-Based Foodgrain Markets.** The share of public procurement is still significant for rice and is even increasing in the case of wheat, indicating some difficulties with respect to the transition to a competitive private sector-based foodgrain procurement system<sup>15</sup>. Large farmers still sell predominantly to the public system. This might reflect capacity constraints within the private system. But, the extent to which individual categories of farmers market through the private procurement system varies greatly between governorates, indicating the role of other factors.

Policy responses to the slow and varying progress in the transfer of procurement activities to the private sector require a better understanding of the factors determining i) farmer marketing strategies and ii) trader procurement behavior. Moreover, improved knowledge of iii) the determinants of trader investment strategies is critical input for reform programs aiming at increasing private sector participation in the procurement and distribution of foodgrains.

**Intergovernorate Trading.** The response of the private sector has been the slowest in the area of distant trading and intergovernorate arbitrage. In fact, the section analyzing the degree of spatial integration between foodgrain markets reveals a considerable level of disconnection between local markets. Consequently, there seems to be a real need for promotion of private intergovernorate trading. Reform programs may need to address eventual obstacles at that level. They may also need to include complementary measures,

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<sup>15</sup> Discussions with traders and millers in January and February 1994 indicated that rice procurement has taken a deep plunge in 1993, due primarily to low procurement prices.

such as raising the level of transparency and facilitating the flow of market information in order to induce private sector operators to expand activities and invest in intergovernorate arbitrage. Here again, knowledge of the factors determining private traders's investment strategies would be a useful input in the formulation of reform programs. The same applies to potential obstacles that contribute to the segmentation of intergovernorate markets.

**Technology Dualism and Costs in Milling Industry.** The observed technological dualism in the processing sector may constitute the biggest obstacle to further reduction of unit costs and increased private sector participation in the processing. The extent to which reforms will lead to increased competitiveness of local foodgrains in domestic and export markets will depend among others on their success in i) promoting private sector access to improved milling technologies and, in the meantime, ii) cutting the currently relatively high milling costs in the public sector. Research on i) the structure of costs in the private and public processing sectors, as well as, on ii) the technological and other obstacles to increased private sector participation constitute a critical input into this component of the reform programs.

**Responses in Farm and Non-farm Sectors of the Rural Economy.** The stagnation in marketed surplus observed among small farmers could have two reasons. First, they might not respond to the reform programs in general in terms of higher output levels. Or, at least, they might not react to changes in the marketing system in terms of increased output sales. In both cases, they would be left behind and would not be profiting from the reform process. This finding is important if one notes that small farmers account for almost 20 percent of owned agricultural land and represent nearly 70 percent of land owners in Egypt.

Furthermore, trading in foodgrains and other farm products figure prominently among non-farm activities in rural areas, creating direct links between ongoing reforms in farm output markets, on the one hand, and rural employment and income diversification, on the other hand. Monitoring the impact of reforms at the level of small farmers and on off-farm activities is, consequently, critically important for the sustainability of the reform process. To be effective, such monitoring would need to be supported by locally-based research on the adjustments within the small farm sector and in terms of off-farm employment and income generation.

So far, this part of the study has focused only on changes and responses on the output side. In conjunction with output market reforms, the government has carried out significant input market reforms as well. Adjustments in the latter markets are the focus of the next sections.

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