12 Food Subsidies in Egypt: Implications for the Agricultural Sector

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Food subsidies affect various sectors of the Egyptian economy, but their influence on agriculture, which employs a considerable share of the nation's resources, seems particularly strong (von Braun and de Haen, 1983). A major objective of this research was to analyze the agricultural policy-making in the environment of a large and growing food subsidy system. Inefficiencies and misallocation of resources in agriculture arising from food subsidies are hidden costs of such systems. However, it is crucial to separate out from the whole bundle of policy goals and related instruments those that are directly or indirectly linked to food subsidies. The basis for this can be provided only by a complete quantitative assessment of a country's agricultural policy and its determinants.

Those commodities that are strictly rationed at fixed prices on the food distribution side are also strictly controlled on the production side. Rice, pulses, and sugar are examples. Nonrationed or not strictly rationed commodities like wheat, maize, sorghum, and meat have experienced considerably less interference in allocation and marketing. Agricultural input and output prices are distorted in different ways: whereas field crops are usually taxed, the production of meat and milk has typically been protected by import restrictions and by the supply of subsidized feed. The special situation for feed and livestock indicates that food policy may cause a consumer-to-producer transfer and even a producer-to-producer transfer, which accompanies redistribution of incomes among the production sectors within agriculture.

The following assessment of the effects of food subsidies on agriculture takes account of specific linkages and policy mechanisms. The effects on production of procurement, price fixing, area allotment, and the competition for scarce public funds have been considered. A distinction has been made between those markets where subsidized and rationed commodities are released from government outlets and so-called open or free markets, where transactions of food commodities are uncontrolled (von

Braun and de Haen, 1983). The sector analysis is supplemented by micro farm studies, which examine the intrasectoral income distribution effects of food subsidies and price distortions for different types of farm households and assess farm households' behavior toward the subsidized food distribution, that is, their response in production, marketing, and consumption of cereals (Alderman and von Braun, 1984).

Food Subsidies and Public Spending on Agriculture

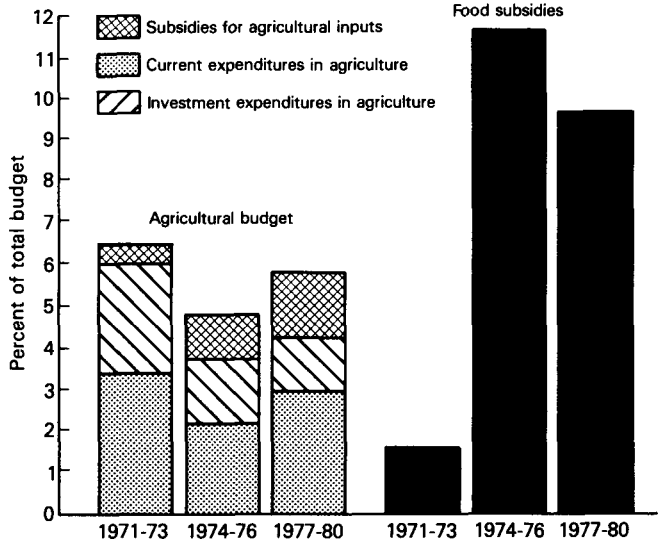
Since 1973, food subsidies, which were negligible in the 1960s, have accounted for 7 to 15 percent of total public expenditures. The additional drain on the budget in the 1970s had repercussions on other expenditures, as these subsidies were not entirely financed by increased revenues or deficit spending. How was public spending on agriculture affected, including agricultural investment and research and development efforts?

The agricultural budget, which had been steadily declining between the mid-1960s and 1974, has grown in real terms since then. The rise in public expenditures in the mid-1970s reflects release from the war burden and a reshuffling of the economy toward a more open and privately oriented system. Gross domestic product in real terms grew twice as fast during 1972–80 than during 1965–72 (7.3 percent versus 3.7 percent).

The agricultural budget has undergone far-reaching structural changes. Input subsidies, mainly for fertilizer and pesticides, became a major component of the budget in the 1970s, whereas these commodities were slightly taxed in the 1960s. Other current expenditures were stable in real terms, but their share decreased because expenditures on investment and agricultural input subsidies grew. Input subsidies increased, as did food subsidies. Clearly, in terms of domestic currency, when import prices rose and uncontrolled domestic prices were inflated, the government attempted to stabilize both controlled consumer prices and agricultural input prices.

To a degree, the agricultural budget (investment and current expenditures) was forced to play the role of a fund of last resort. However, if subsidies for agricultural inputs, which parallel consumer subsidies on food, are included, the gross fiscal support of agriculture is not reduced relative to rising food subsidies (figure 12.1). In the last years of the 1970s and the early 1980s, fiscal support of agriculture began to be restructured, with a stronger focus on investment in land improvement, research, and development. But public investment in the sector remains small: only 9 percent goes to agriculture, which still provides about half of the country's employment and 20 percent of national income. More is spent on food subsidies than on the agricultural sector (figure 12.1).

FIGURE 12.1 Shares of food subsidies and agriculture in the total Egyptian budget, 1971-80



SOURCE: Von Braun and de Haen, 1983.

Relation of Food Subsidies to Government Interventions in Agriculture

In analyzing the effects of price and market intervention policies on agricultural income, on producer and consumer welfare, and on the government budget, this market analysis by commodity provides the groundwork for a final policy evaluation in which the relation between agricultural taxation (the "burden on agriculture") and food subsidies is assessed. All major agricultural commodities are included in the analysis (von Braun and de Haen, 1983).

Effects of Price Policy on Cereals Markets

The three major cereals produced in Egypt—wheat, rice, and maize—are affected in different ways by agricultural policy, and their market structures do not have much in common. The producer prices of all three, especially wheat and rice, are kept below international prices. The government procures rice and wheat but not maize. Whereas procurement for rice is compulsory, with a quota per unit of land, a similar regulation for wheat was virtually phased out in 1977. Imports of wheat and maize are distributed at subsidized prices, but the former is channeled to consumers

while the latter goes mainly to livestock producers. Egypt's domestic wheat production covered about 20 percent of total consumption in 1982.

Domestic prices are depressed below their international equivalents, which places a burden on wheat producers. This burden may be split into three sources: procurement, depression of the free market, and inefficiency in the allocation of resources for production, which is usually referred to as net social loss in production. Consumers gain from the subsidy on wheat flour and bread, but they also gain from the reduction in open-market prices net of the misallocation to consumption. Most of these gains are covered by government subsidies on wheat imports or procured domestic wheat, and part is indirectly financed by wheat producers.

Subsidized fixed consumer prices ranged from 28 to 58 percent of the international wheat price during 1965–80, and were slightly higher than government procurement prices during the 1960s. This means the government was able to generate revenues from domestic procurement policy, which was compulsory at that time. During the 1970s, the procurement prices usually exceeded the average fixed consumer price.

The international wheat price used in the analysis is the reported value of a unit of wheat corrected for handling costs and for the overvaluation of the Egyptian pound (£E), an overvaluation that fluctuated considerably during the period of observation. The black market rate is used as an approximation of the prevailing shadow exchange rate throughout this analysis.[1] For the calculation of producer losses and consumer gains, the international wheat price adjusted as described should reflect the marginal import price. Egypt receives significant amounts of food aid and concessional imports. In 1980 they accounted for about 30 percent of all wheat imported. It should be noted, however, that the marginal import price, which matters in assessing the opportunity costs of wheat products in Egypt, would be affected by food aid donations only if all commercial wheat exporters to Egypt were also food aid donors, providing aid through a tight relation to commercial sales. This is hardly the case, although sometimes a systematic relation between aid and trade seems to prevail for selected trading partners of Egypt.

The following results were obtained from the market analysis. In 1980, wheat producers had an income loss of £E 134 million, which equals 26 percent of the budgeted food subsidies for wheat. Income lost by rice producers because of rice price policy was about £E 260 million in 1980. Subtracting the social loss in production and the small amount of rice export taxes in that year and adding the government outlays for the direct rice subsidy, one arrives at the actual subsidy to rice consumers, calculated

1. £E 1 was U.S. $1.43 at the official exchange rate but U.S. $1.22 at the black market rate in 1980 (Scobie, 1983).

at the opportunity costs to the economy. This invisible producer-to-consumer rice subsidy corresponds to 20 percent of the official (explicit) budget subsidy for all food commodities.

The subsidy to the maize market is established by the government's import and distribution scheme for using maize for feeding purposes. It amounted to £E 64 million in 1980/81. Other than the implicit consumer subsidy for maize, this explicit subsidy is an income transfer to livestock producers. Its net effect on sector income depends on the effect of both this additional maize supply and meat price policy on meat production.

How cereal market policy affects agriculture becomes clearer when wheat, rice, and maize are aggregated. Excluding the exceptional years of the world food crisis (1973–75), the trend of real income losses of cereal producers has declined significantly since 1965. Cereal production was taxed much less during the second half of the 1970s than in the 1960s. The income loss per ton of cereals in 1975 prices dropped from an average of £E 56 during 1965–69 to £E 30 during 1977–80 (von Braun and de Haen, 1983). In other words, taxation of cereal production was reduced, while explicit food subsidies were increasing dramatically. The parallel development of subsidies and taxation of production, which was so striking during the first half of the 1970s, was not the result of a stable causal relation between the two. The taxation of cereal production declined in the late 1970s mainly because both rice procurement prices and maize prices increased. Wheat price policy did not have much effect on aggregate cereal prices. Despite the decreased burden on cereal production, implicit income transfers from producers were still £E 422 million in 1980, which corresponds to about 75 percent of the explicit cereal subsidy budget in that year. Rice alone accounted for about 54 percent of that.

Food Subsidies and the Overall Burden on Agriculture

Consumers received growing support through depressed cereal prices and subsidized distribution in the late 1970s, after several years of reduced transfers following the international food price crisis (see table 12.1). In 1980, 78 percent of all consumer gains on cereal markets came from wheat, 21 percent from rice, and 1 percent from maize.

Egypt's livestock density is one of the highest in the world. Its animal production sector is closely linked to all cropping activities, because cattle and buffalo are used as draft animals and because fodder production and fodder by-products of major crops are important. Because almost no rangeland is available in the country, the opportunity cost of fodder is determined by the prices of all other crops. Since the mid-1970s, domestic meat prices have exceeded international prices, which indicates that meat production is protected. The same is true for milk production.

TABLE 12.1 Income transfers from food subsidies and distorted prices in farm households, Egypt

Subsidy	Farm Sizes			
	Landless Farm Labor	0-1 Feddan	1-5 Feddan	More Than 5 Feddan
Gains and losses in production and input use (£E per capita per year)				
Cereals and pulses		−1.4	−9.4	−30.9
Meat and milk	0.8	6.8	17.3	15.6
Cotton and cane		−6.0	−29.7	−95.9
Inputs (subsidies)	1.6	6.7	12.9	30.6
Total	2.4	6.1	−8.9	−80.6
Gains and losses in consumption (£E per capita per year)				
Rations and cooperative sales	6.1	7.5	6.9	6.1
Bread and government flour	13.4	13.7	8.7	7.5
Cereals from open market	12.7	11.8	10.8	7.7
Other from open market	−8.1	−9.1	−8.4	−13.9
Total	24.1	23.9	18.0	7.4
Total expenditure	189.9	238.7	274.5	388.4
Net gains or losses	26.5	30.0	9.1	−73.2
Percent of total expenditure	14.0	12.6	3.3	−18.8

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

NOTE: Farm households are classified by the main occupation of the head of household. One feddan = 0.42 hectare.

Because meat is consumed mainly by the high-income population, the price policy has important implications for equity as well. In other words, meat and milk protection transfers income from the urban to the farm sector (chapter 11). Taxation of most other farm products does the opposite. Farmers' gains from protectionist prices increased remarkably during the 1970s. This partially compensated for the producers' losses on the other commodity markets.

Price distortions affect not only the distribution of income between producers and consumers but income transfers between crop and livestock production sectors as well. Insofar as feed prices are distorted, they will change the competitiveness of livestock production with crop production.

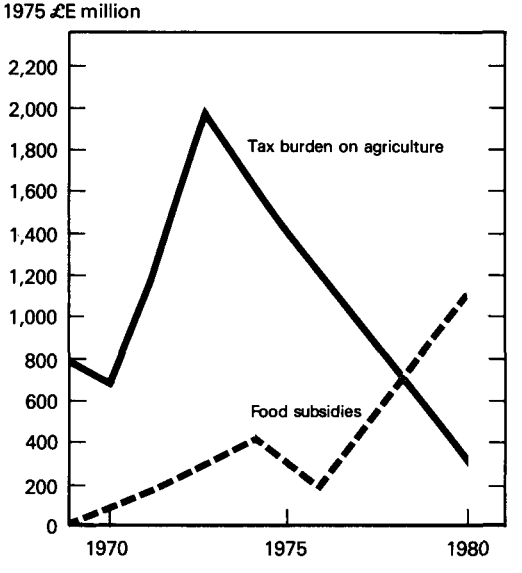
Direct and indirect feed subsidies, with protectionism on the output side of animal production, give a different picture of the aggregate taxation of agriculture than if only major field crops are taken into account. The following aggregation of all losses and gains of the farm sector due to price distortions further highlights this fact. This aggregate burden on agriculture, expressed in 1975 prices, fluctuated between £E 500 million and £E 1 billion between 1965 and 1972. After an extraordinary peak in 1973-

75, it dropped to about £E 350 million per year in 1976. In other words, agriculture was implicitly taxed much less in the second half of the 1970s than before (see figure 12.2). The total burden was reduced mostly by lowering the burden on cereals and cotton and increasing protection of animal products. It was mainly the development of livestock protection after 1974 that changed the relation between agriculture and the rest of the economy.

As the time series of the implicit producer to consumer transfers for the major food commodity markets show, explicit food subsidies evolved out of a system of implicit consumer subsidies largely financed by agriculture. The skyrocketing food subsidy budget for the system after 1973 is astonishing only if the agricultural policy and related implicit subsidies of earlier years are ignored. High population growth, high income growth, and weak performance of agricultural production suddenly induced a rapid decrease in self-sufficiency. How did agricultural policy react to this change?

A regression model was used to assess more comprehensively the role of each of the contributors to the total burden. The model evaluates the hypothetical effects on the agricultural burden of the three major policy objectives: to isolate domestic prices from international price fluctuations,

FIGURE 12.2 Development of food subsidies and the tax burden on Egyptian agriculture, 1970–1980



SOURCES: Von Braun and de Haen, 1983; Alderman, von Braun, and Sakr, 1982

to generate public revenues, and to reduce explicit food subsidies (von Braun and de Haen, 1983).

The results show that factors representing the domestic price stabilization objective and the availability of government revenues dominate changes in the burden on agriculture. The rising food subsidy bill either had no effect on the burden on agriculture or it tended to reduce it. The estimation results also reveal how important increased fiscal revenues from other sources, such as oil and the Suez Canal, were in the rapid decrease of the tax burden on agriculture.

The results do not indicate that agricultural policy is being dramatically revised as part of an economic strategy that emphasizes agriculture more and industry less, but they show a general shift in this direction. Government's behavior in the past indicates, however, that if revenues get tight agricultural policy may be redirected to increase the burden on agriculture in order to save fiscal resources but maintain the price level of major food items distributed through public sector channels.

Food Subsidies and Farmers: Income Effects and Farm Household Responses

The sectoral perspective followed so far has allowed assessment of agricultural policymaking in the environment of a dominating food subsidy system. In general, food producers are losing because of the policy, while consumers gain, although for some markets like meat and milk the picture is actually reversed. How this policy affects farm households, which are both producers and consumers, deserves further analysis. The farm population participates heavily in the subsidy scheme as consumers, and the production pattern of implicitly taxed or protected products is far from being uniform among Egyptian farms. The specific loss and gain patterns of farm households determine the income distribution effects of the price policy within agriculture. They are assessed below.

Farm Income Effects

A comparative static approach was applied to broadly quantify product-specific income effects of distorted prices on a household basis (Alderman and von Braun, 1984). Survey data collected specifically for this purpose were used for the analysis. The patterns of losses and gains and the size of the net loss or gain were determined by the level and structure of price distortions, the farm production structure, input intensity and productivity, and resource endowments. Production structures and input intensity are again heavily determined by input and output price ratios and levels, including prices of inputs such as labor. Abundant family labor at low opportunity costs on small farms usually leads to higher production

intensity there. This may, all things being equal, result in higher yields, and production may be directed toward more labor-intensive activities, such as the livestock sector.

These determinants actually establish a distinct gain-loss pattern in the farm sector, as small farms are relatively more concentrated in the labor-intensive (protected) livestock sector, whereas bigger farms actually lose disproportionately from higher shares of implicitly taxed crops in their production programs. Table 12.1 shows these patterns for three farm-size groups. It should be mentioned that not all of the allocation differences between farm-size groups are a consequence of the actual incentive structure but may be partly the result of government-enforced area allotments (such as those for cotton, sugar, and rice).

Small farmers (less than one feddan, or 0.42 hectare) are net gainers from the distorted price structure on the production side, which adds to their gains (income transfers) from food subsidies on the consumption side. For this group, losses on cereals, sugarcane, and cotton are overcompensated for by the gains from animal production and input subsidies (mainly feed). Although medium-sized farms (one to five feddan) are net losers on the production side, these losses are less than their gains on the consumption side, leaving the group a net gainer. This is not the case with larger farms of more than five feddan. In this group, net losses on the income-generating production side greatly exceed income transfers on the consumption side.[2] For income distribution of the agricultural population as a whole, the combined effect of food subsidies and distorted agricultural prices is even more progressive than the income transfer effects on the consumption side alone.

Many rural people derive income from part-time agricultural production activities, even landless farm workers. In a classification into ten groups by employment, landless farm workers is the poorest, with a mean per capita income 32 percent below the rural average and 62 percent below the urban average. For these workers, subsidies and price distortions result in a net gain of 14 percent of their current nominal expenditure, while the larger farmers have a net loss of 18.8 percent relative to their total expenditure. This reflects the fact that the food basket purchased by the landless has a high proportion of subsidized commodities, hence this group has a high *relative* subsidy. The extent to which landless farm workers benefit both from wheat flour and bread directly subsidized by the government and from low open-market prices of cereals is particularly striking (table 12.1). The sum of these explicit and implicit subsidies on cereals represents 13.7 percent of their total expenditures. Given the high budget

2. On-farm consumption is excluded from the gain-loss balancing on the production and consumption sides, as it does not affect net income transfers.

share of basic food expenditure by rural wage laborers, any reduction in subsidized food supplies to rural households, possibly combined with a policy of higher cereal prices on the open markets, would have negative effects on this group's food situation. Unlike farm households with actual or potential cereal production, landless laborers would not immediately benefit from compensatory measures focusing on output pricing if such instruments were applied parallel to a reduction of food subsidies.

Cereals are the dominant source of calories in Egyptian farm households, and acquisition of subsidized cereals plays an important role for the levels and composition of cereals consumption. Therefore, analyses of the effects of the availability of subsidized cereals on grain production, on the marketing of farmers' own grain produce, and on cereals consumption are of particular interest. The overview for the aggregate supply and disappearance balance of all cereals by farm households in table 12.2 reveals that

1. Cereal consumption per capita hardly increases by farm size. Overall, it is at a fairly high level in per capita terms.[3] The composition of this consumption, however, does vary by farm size.
2. Subsidized cereals from direct government distribution make up one-third of cereals consumption in rural households.
3. Rural households in Upper Egypt receive about twice as much subsidized cereal from the government as those in Lower Egypt.
4. Landless households acquire about the same amount as small farm households (less than one feddan), but with increasing farm size, households make less use of subsidized cereals.
5. Even medium and big farms purchase considerable amounts of cereals. At the same time, they sell their own produce. Market integration of farm households is generally fairly high in Egypt.

Farm Household Responses

The availability of subsidized cereals in farm households decreases grain production, but farm households with higher grain production make less use of subsidized cereals. A bakery in the village, other things being equal, induces a reduction of grain production in that area by 13 percent, and if subsidized cereals acquired by the household are increased by 10 percent, grain production drops by 0.5 percent. These production effects of subsidized cereals distribution turn out to be significant after farm size differences and government acreage allotment for cash crops (cotton and sugarcane) are accounted for in an analysis based on farm household data (Alderman and von Braun, 1984).

3. These quantities are not intakes, as intrahousehold losses are not accounted for.

TABLE 12.2 Aggregate cereal balances for rural households, Egypt, 1981/82 (kilograms per capita per year)

Rural Households	Cereal Supply[a]			Cereal Disappearance[a]		
	Pro-duction	Purchased		Sales and Seed	Human Consumption	Animal Feed
		Open Market	Subsidized[b]			
Upper Egypt	137	143	147	53	326	49
Lower Egypt	191	166	79	96	314	27
Landless	0	197	129	0	304	23
0-1 feddan	98	160	131	22	329	38
1-3 feddan	268	141	78	112	328	49
3-5 feddan	361	108	59	186	314	30
>5 feddan	607	95	55	378	332	43
Total	171	158	104	80	319	35

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

[a]From direct government distribution.

[b]Cereals and cereals products are expressed in wheat grain equivalents of kilograms per capita per year (wheat, flour, bread, maize, rice, sorghum, and barley are included).

Responsiveness to price differentials between food grains (rice) and grains used as feed (wheat and maize) and the strong response of grain production to input prices for livestock production (straw) emphasize the effect of livestock protection on grain production. Feed demand for livestock and its price effects on cereal by-products has a different effect on the various crops: maize production goes up while overall grain production is reduced when there is more livestock on the farm. In addition, wheat production is affected in a particular way due to the importance of wheat straw for fodder. An increased straw price significantly increases the incentive to grow wheat. This increases total grain output as well.

Availability of subsidized cereals turns out not to significantly affect grain sales of farm households but does increase total per capita consumption. Contrary to expectations, increased consumption of subsidized cereals does not significantly increase the marketed surplus of grain produced on farms. One might expect that households make use of subsidized cereals in substitution for consumption of their own produce and thus implicitly resell subsidized bread, flour, or maize because sales of grain would be higher. But this is not suggested by empirical analysis. The main adjustment to the availability of subsidized cereals occurs in consumption, not in production and sales by farm households. An additional kilogram of subsidized cereals per capita raises consumption by 763 grams per capita.

Conclusions and Policy Implications

Egypt's current food subsidy system did not spring from one decision made in the early 1970s, even though it was then that the huge fiscal outlays that characterize it began. It evolved from agricultural and consumer price policies implemented a long time before. These policies included export taxes to finance an industrial growth strategy and implicit transfers of income from producers to consumers—implicit food subsidies to finance cheap food prices. Given this background, it is not surprising that Egypt moved to an explicit food subsidy scheme as the self-sufficiency of major commodities that were implicitly subsidized (such as wheat) decreased rapidly.

The course that Egypt's food policies have taken provides an important lesson for countries keeping producer prices low to support consumers. Supply and demand projections show that many of these countries are going to become net importers of food in the years ahead. If they have rather plentiful nonagricultural resources—as Egypt had, mainly because of its rapidly developed oil reserves, the Suez Canal, and foreign assistance—it seems fair to predict that many of these countries are going to drift from implicit to explicit food subsidy schemes, as Egypt did. But when this happens, tight budgets will make severe internal distribution conflicts unavoidable. These countries will have to know more about how to revise their food pricing systems and still ensure nutritional well-being.

Another issue is raised by the conclusion that, in spite of rising budget outlays for food subsidies, the income burden on farm production has been steadily reduced. This reduction was the result of several factors, including changes in procurement policies, adjustments of price levels and price ratios, and variations in interventions in agricultural trade. It was particularly a result of rising prices in domestic open food markets. During the course of the 1970s, agriculture financed low consumer prices less and the general taxpayer financed them more. Agriculture's contribution to the system decreased in absolute terms. This means that consumer subsidies are not always a burden to agricultural production. In Egypt, the system's expansion by and large has not been a burden for the agricultural sector. However, it was possible to shift from implicit to explicit subsidies only because government revenues increased. Foreign assistance played its part in that.

The implicit tax burden on agriculture is not equally distributed within the sector. The net effects of gains and losses on the production side from taxation of some crops, such as cotton and cereals, and protection of others, such as milk and meat, favor the small farmers. Combined with income transfers on the consumption side from food subsidies accrued, small farming households clearly are net gainers from the price and sub-

sidy policy, whereas big farming households are net losers. The distortions of agricultural output and input prices make the food subsidy system even more progressive for income distribution within the farm population. Farm-level analyses reveal that provision of subsidized cereals to farm households induces somewhat reduced grain production but mainly adds to consumption.