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**EGYPT'S FOOD SUBSIDY POLICY:
EVALUATION OF EFFECTS
AND POLICY OPTIONS
FOR THE 1980s**

Prepared by

**Harold Alderman
and
Joachim von Braun**

FINAL REPORT

**International Food Policy Research Institute
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036 USA**

**Under Grant No. AID/DSAN-G-0259, Project No. 931-1275
Submitted to U.S. Agency for International Development, April 1986**

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1. INTRODUCTION

Few developing countries allow food prices to be determined unhindered by market forces. Governments commonly employ a variety of instruments--consumer subsidies, quantity rations, import and export restrictions, parastatal marketing companies, forced procurements, and foreign exchange undervaluation--to influence consumer and producer prices.¹ Egypt combines all these instruments in a complex tapestry of policy interventions that is noteworthy for both its scale and its durability. Furthermore, like many complex weavings, it is difficult to isolate the various strands. Major and minor motifs form new meanings with alterations of the background while retaining their basic shapes. Some of these motifs can be traced to Fatamid and Mamaluke times, others to the contingencies of twentieth-century wartime crises.² Yet the current meaning of these themes needs to be seen in the contemporary setting of a state neither fully committed to materials planning and quantity restrictions nor comfortable with a laissez-faire market.

The current subsidy system, then, does not represent a sharp break from the past. By 1980 the cost of food subsidies had risen to more than 1 billion Egyptian pounds. By that year also, imports of wheat, flour, and edible oils had risen to three-quarters of the total amount of those goods consumed in Egypt. As the magnitude of the subsidy bill and the foreign-exchange requirements rose, food subsidies became an issue, not just for welfare and nutrition policy or for agriculture but for macroeconomic and trade policy as well. To meet the need for information necessary to understand the impacts of the rationing and subsidy system on these various aspects of the economy, the International Food Policy Research Institute, in collaboration with Egyptian institutions, undertook research in Egypt between 1981 and 1983 under a grant from the United States Agency for International Development (USAID), Office of Nutrition (Grant DSAN-G-0259, Project No. 931-1275), with the technical supervision of the Nutrition Economics Group, Office of International Cooperation and Development of the United States Department of Agriculture. Six specific research tasks were undertaken:

1. A descriptive analysis of current and recent government policies related to the procurement, pricing, and rationing of food in Egypt, including implementa-

¹ A. Saleh, "Disincentives to Agricultural Production in Developing Countries: A Policy Survey," Foreign Agriculture 13 (1975 supplement): 1-10, lists the interventions that affect producers in 50 developing countries.

² Boaz Shoshan, "Fatamid Grain Policy and the Post of the Muhtasib," International Journal of Middle East Studies 13 (1981): 181-189, and Shoshan, "Grain Riots and the 'Moral Economy': Cairo 1350-1517," Journal of Interdisciplinary History 10 (1980): 459-478, report examples of price interventions in two regimes, including a familiar-sounding incident in which market inspectors fixed the prices of coarse and *fino* breads.

tion procedures and the identification of potential and apparent weaknesses and leakages in the process.³

2. An analysis of (a) household decisionmaking regarding the purchase of rationed and subsidized foods, (b) the perceived costs to the household of acquiring such foods in relation to the costs of obtaining similar foods in the free market, (c) household characteristics that influence such perceived costs, and (d) the extent to which economic benefits from selected policies are captured by various groups of market agents--formal or informal groups, legitimate or illicit operations--instead of consumers, including the identification of relations among these leakages, the characteristics of the specific policy measure, and the implementation procedures and household decisionmaking behavior.⁴

3. An analysis of the direct effects of selected existing and alternative food-price subsidy policies and food-rationing policies on real incomes, food consumption, and nutrition within each of a number of predetermined population groups, with emphasis on the urban and rural poor.⁵

4. An analysis of the implications of selected procurement and pricing policies for domestic food production, farm-sector incomes, and incomes of the rural poor--landless laborers and low-income farmers.⁶

5. An analysis of the government expenditures associated with selected policies, the sources of public revenues, the distributional burden of the cost of the policies and the implications for investment and intersectoral terms of trade.⁷

6. An analysis of the foreign exchange implications of selected price policies.⁸

After the completion of these research tasks, a model was constructed to predict the impact of various alternative subsidy and rationing policies on various macroeconomic indicators and on indicators of nutrition and income

³ The results of this task are presented in Harold Alderman, Joachim von Braun, and Sakr Ahmed Sakr, Egypt's Food Subsidy and Rationing System: A Description, Research Report 34 (Washington, D.C.: International Food Policy Research Institute, October 1982).

⁴ This task is reported in Harold Alderman and Joachim von Braun, The Effects of the Egyptian Food Ration and Subsidy System on Income Distribution and Consumption, Research Report 45 (Washington, D.C.: International Food Policy Research Institute, July 1984).

⁵ Ibid.

⁶ See Joachim von Braun and Hartwig de Haen, The Effects of Food Price and Subsidy Policies on Egyptian Agriculture, Research Report 42 (Washington, D.C.: International Food Policy Research Institute, November 1983).

⁷ Grant M. Scobie, "Egyptian Public Food Program Study, Report on Task 5: Food Subsidies and the Government Budget in Egypt," Report submitted to USAID, January 1984.

⁸ Grant M. Scobie, Food Subsidies in Egypt: Their Impact on Foreign Exchange and Trade, Research Report 40 (Washington, D.C.: International Food Policy Research Institute, August 1983).

distribution as well. This model was used to explore six scenarios, plus two variations of the original six, using alternative GNP growth assumptions.⁹

The present paper contains a summary of each of these tasks, including the projections of policy options. The report, then, is intended to elucidate the linkages among the various tasks and assist the policy planners in obtaining a perspective that encompasses both the costs and the benefits of the system.

The order of presentation here is a reversal of the normal procedure: the conclusions come first. This will allow the reader to use the details presented in the subsequent chapters as support and commentary rather than as initiation. The details, however, beginning with a brief description of the ration systems, are also presented to substantiate the conclusions reached. Following the outline in Chapter 2 of the mechanisms by which the subsidies and rations are delivered, there is a discussion of the macroeconomic and trade implications of the system. Food policies in Egypt are hardly interventions at the margin; fiscal costs of consumer subsidies accounted for 10-15 percent of total public expenditures during the second half of the 1970s and the early 1980s. Consequently, food policies bear on the country's foreign-exchange position, its ability to invest, and its domestic inflation, as will be outlined in Chapter 4.

Subsidy policies may also affect both food production and income in the agricultural sector. Evidence of the relations between food subsidies and the agricultural sector will be presented in Chapter 5.

The effects of the subsidy policies on nutrition and income distribution are the subject of the following chapter. Chapter 7, in which the projections of policy options are discussed, will provide the tie between these household-level consumption effects and the economic costs of various alternatives to current subsidy policies.

It should be noted that the project to study Egyptian food subsidies has not been an academic exercise undertaken in a vacuum. The Institute of National Planning in Cairo was a collaborating institution throughout, assisting in the design of research relevant to expressed needs of Egyptian policy planners. Moreover, regular contacts with government officials guided the direction of the research. These began as hospitable one-way flows of information and experience toward IFPRI but evolved into a more balanced exchange as the project generated data of use to the Egyptian colleagues. Nevertheless, the debt of gratitude is overwhelmingly ours, particularly to Ahmed Abdel Ghaffar of the Ministry of Supply, Ismail Badawy of the Ministry of Irrigation (earlier with the Ministry of Economy), and Yahia Mohie El Din of the Ministry of Agriculture, as well as to Sakr Ahmed Sakr of Munufia University, Ahmed Goueli of Zagazig University, and the staff of the Institute of National Planning.

We are also grateful to Martin Forman and Nicolaas Luyx of the USAID Office of Nutrition and to Roberta van Haefen of the USDA for their valuable assistance and support throughout the project. We also thank John Gerhart of the Ford Foundation for his intellectual and financial support.

⁹ This project was funded by the Ford Foundation, Cairo. See Harold Alderman and Joachim von Braun, "Egypt: Implications of Alternative Food Subsidy Policies in the 1980s," Final Report to the Ford Foundation (Washington, D.C.: International Food Policy Research Institute, April 1985).

2. SUMMARY OF POLICY CONCLUSIONS

IFPRI took a broad approach to its study of the Egyptian food subsidy system. The need to evaluate the implications of the system for foreign trade and for the economy as a whole, the effects of subsidies on agriculture, and the effects of the system on income distribution and nutrition in order to cover the costs and benefits of the policy comprehensively were evident at the outset of the research.

Although a rigorous cost-benefit analysis was not attempted, the research was focused on the fiscal and economic costs and the distributional and nutritional benefits of the subsidies.

Conclusions Drawn from the Analysis

1. The rise in world food prices in 1973 and 1974 contributed to a sharp rise in the cost of subsidies in Egypt. Food policies that insulated consumers from movements in international prices led to large domestic subsidies and a greater allocation of foreign exchange to food imports. But despite the subsequent decline in world prices, real expenditures on food subsidies per capita were twice as high during the years 1979-81 as they were during the "crisis" period of 1973-75. Still, 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 which characterize it began. It evolved from existing agricultural and consumer price policies that had been implemented a long time before. These policies included export taxes to finance the industrial growth strategy that had been adopted and implicit transfers of income from producers to consumers--implicit food subsidies to finance the low food prices. Given this background, it is not surprising that Egypt moved to an explicit food subsidy scheme, as the self-sufficiency in major commodities, such as wheat, that were implicitly subsidized decreased rapidly. Indeed, a significant change in consumer price policy would have had to be made for Egypt not to have drifted toward an explicit subsidy system in the 1970s.

2. The full cost of the food subsidies has been met in two ways. The accounts of the central government have included part of the cost through allocations to the General Authority for Supply commodities (GASC), whose responsibility is to arrange the purchase and delivery of imported foodstuffs. The government, through the Foreign Exchange Committee, authorizes the Central Bank to provide the foreign exchange to GASC. The cost in Egyptian pounds incurred by GASC in acquiring imports depends on the exchange rate set for food. This rate, in Egyptian pounds (LE) to the U.S. dollar, has often been lower than that for other commodity transactions and has always been substantially lower than the own or free exchange rate. As a consequence, the full social opportunity cost of the foreign exchange used in acquiring imported foods has not been reflected in the reported costs of the subsidy.

3. The rapid rise in the costs of food subsidies to the central government has contributed to the budget deficits. Of course, food subsidies are only one of

many items that contribute to the deficits. These have been met by both foreign and domestic borrowing. The rate of domestic inflation has been higher than it would have been without the deficits. The excess demand for foreign currency has driven up its price on the free market. Some of the excess demand was relieved by a decline in the stock of net foreign assets. The exchange-market pressure has closely reflected the expansion of the monetary base that accompanied the rise in budget deficits. Clearly, any policy that reduced the pressure associated with these deficits and their consequences for the monetary base would lessen the inflation rate, the devaluation of the Egyptian pound, and the decline in net foreign assets. However, since food subsidies are only one item contributing to the deficits, compensatory cuts in other expenditures would reduce the effects on inflation, devaluation, and the balance of payments correspondingly.

4. The political commitment to a system of food subsidies has made it difficult to change the level of food imports from year to year. If the price of imported food rises, or if the supply of foreign exchange falls, little if any of the adjustment takes place in the allocation to imports of food. One of the effects of a food subsidy scheme is to transmit much of the instability in the foreign exchange sector to the import of other goods. It is true that foreign borrowing and the use of reserves can contribute to the process of adjustment and have done so. However, there are limits to their capacity to absorb the instability; unanticipated swings in other imports have been a crucial mechanism of adjustment.

5. These other imports consist largely of industrial raw materials and capital goods. Any decline in the supply of foreign exchange is met first by postponing the import of capital goods, then by reducing imports of raw materials, and finally, and only in a minor way, by reducing the quantity of food imported. Food consumption is maintained at the expense of output and employment in the nonfarm sector and of growth in the capital stock. This transmission of instability to capacity utilization and industrial growth is a hidden cost of a food subsidy scheme that depends heavily on imported foods. Neither the existence of this cost nor its size has received much attention. National and international policies that reduce instability in the cost of importing foods or that offer better mechanisms for adjustment would lessen the impact on industrial output, employment, and investment.

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

7. It has been shown that in the early years of exploding outlays for food subsidies, public investment in agriculture, already disproportionately low, was reduced further. In recent years more funds have been allocated to promotion of production of those crops whose output has lagged the farthest behind demand.

8. It must be emphasized that the burden on the income of Egyptian farm producers was not reduced primarily by streamlining price distortions in agriculture. Policy changes included larger subsidies on inputs, so that implicit taxation of basic food commodities was reduced and livestock production was, to a greater extent, protected. The principal inefficiencies in allocation were inherent in Egyptian agricultural policy before the budget outlays for food

subsidies began to expand in the 1970s. The net social loss in the production and consumption of all the commodities considered in this study accounted for 1.5 percent of national income in 1979-80. But the increase of the explicit subsidy expenses alone cannot be held responsible for these costs. The bulk of the social costs were the result of the price distortions caused by the protection of livestock production, the taxation of cotton, and depressed cereal prices; only the last of these was a result, in part, of explicit and implicit food subsidies. Removal of price distortions might be needed if agriculture is to grow more rapidly, but, as the analysis of supply response has indicated, it might not be enough. The rigid constraints on resources, deficits from bad management of supplies of public water and inputs, and the inefficiency of the agricultural extension service tend to offset the incentives given to growth by price adjustments. Price policy should not be regarded as a panacea for Egypt's rural development and national food problems.

9. The food subsidies provide benefits to those reached by the system, whether directly or indirectly. The various elements of the food distribution system--rationing, subsidized bread, subsidized flour, cooperative shops in the public sector--have different equity effects. Most households--93 percent--had ration cards, and the four rationed commodities--sugar, oil, tea, rice--were obtained regularly by 95 percent of the households. Households purchase additional quantities of these commodities on the open market. For instance, about 80 percent of the households buy sugar from other sources to supplement the rationed quantities. Thus the main result of the ration system is transfers of income. Analysis shows that income transfers through the ration system have a clearly progressive effect on income distribution but favor the urban population and the Nile Delta.

10. The availability of subsidized bread from licensed bakeries and flour at fixed prices--the two most important commodities in the system--differs throughout the country. Bread is usually available in the cities, and flour is available in most rural regions. Since quotas are placed on purchases of bread or flour only occasionally and since the income elasticities of some types of bread and flour are positive, the income transfers incorporated in these commodities increase as income increases. Households in Upper Egypt and in urban areas in general benefit from this part of the system more than other households do. It should be noted, however, that as consumers rural households benefit significantly from depressed grain prices on the open market. These prices are low, in part, because of import subsidies for wheat and maize and export taxes on rice. Together with the gains of rural households--farm producers--from livestock protection, the overall effect of subsidies and food price policy on distribution helps to equalize incomes and is biased against the urban population.

11. While subsidies provide a large part of the real incomes of the poor, this comes mainly through the subsidy on balady flour and bread and the ration system. Similarly, subsidies on yellow maize and animal feed seldom reach small farmers and landless producers of meat and dairy products. The entire system of subsidies and consumer prices--including both government outlets and open markets--favors the poorer groups in the population more than the upper-income groups. But there are components of the system that favor the rich. These include the subsidies on commodities sold by cooperatives, and the subsidies on *fino* flour and *fino* bread (72 percent extraction rate). Therefore, the subsidies transferred through government outlets favor the urban population and are somewhat regressive.

12. Food subsidies contribute to inflation to the extent that they increase the fiscal deficit. Because the prices of those food commodities on which the poor spend a large share of their budget are kept nominally stable through subsidies, a reduction of food subsidies might reduce inflation over all, but it would shift more of the burden of inflation onto the poor.

13. When the demand for food at a given price exceeds the supply at that price, either the price rises or local disequilibrium occurs. With many prices fixed in Egypt, goods are distributed at the margin either by fixed rations or through a willingness to wait. Rations entail little allocative inefficiency. In effect, they serve as income transfers from government revenues to virtually all consumers. However, lines at cooperatives, which indicate shortages of certain commodities, have resource costs that are not captured by any segment of the economy; the opportunity costs of waiting are not revenues for anyone. The resource cost of searching and waiting, then, should be subtracted from the transfer of more than LE 100 million to individuals through the cooperative system. The net benefits were probably much smaller than the income transfer. Similarly, a smaller resource cost should be subtracted from the transfer inherent in bread and flour, because shortages of bakeries and of outlets for flour reduced the average net gain to consumers from the subsidies on those items. Since it can be shown that willingness to wait did not increase the proportion of goods that went to the poor, such resource costs do not serve as a way of allocating commodities.

14. There is some concern in Egypt that subsidized food is wasted. A careful assessment of the use of bread and flour for animal consumption shows that in 1982, about 6 percent of the supply of wheat appears to have been used as livestock feed. The costs to the economy are less than the subsidy because this use of bread and flour has an output effect as well, but the resources that go into processing and distributing those commodities are wasted.

15. Egyptian households acquire more food than households in most developing countries do, although there is moderate malnutrition and child mortality remains high. It appears, then, that policies aimed at increasing purchases of food by households are not the most effective tools for eliminating malnutrition. This is especially true of policies aimed at promoting expensive animal products. On the other hand, income transfers from the subsidy system are an appreciable portion of the real purchasing power of many families. For example, more than half the families in upper Egypt received transfers from government-distributed food that made up more than 10 percent of their expenditures. The proportion in greater Cairo was nearly 40 percent. As elasticities for calories for the poorest rural and urban quartiles were 0.40 and 0.30, respectively, the loss of this transferred income would have reduced daily calorie consumption of these families by 100-200 kilocalories per capita. In addition, if marginal prices of breads, flours, and grain were changed, consumption, distinct from income effects, would be reduced. Depending on the form of the reduction in subsidy expenditures, then, such policy changes could affect nutrition appreciably.

Implications of Alternative Policy Options

16. The Egyptian economy is moving toward a situation of difficult policy choices. The core of these discussions involves the appropriate allocation of resources to present consumption versus investment to create long-term employment and growth. The principal issues related to present consumption are the pricing of energy and basic foods. Food subsidy policies are only one subelement of the policy-choice problem. Neither food subsidies are the sole cause of the Egyptian economic problem nor would their abolition provide the remedy for the fiscal, foreign-exchange, and employment problems the country is facing in the 1980s. Conclusions from a model built on the basis of the in-depth partial analyses reported above provide the basis for policy guidance in the attempt to answer the following question: If a decision on food subsidy policies is to be made, what are the effects of alternative options on macrovariables as well as on the various segments of the population and on the poor in particular? Accounting for fiscal and economic costs of food subsidies makes sense only if those outlays are related to the benefits of food subsidies. A "costly" food subsidy program may be

economically efficient if its policy objectives are reached efficiently. Therefore, the policy options should be simultaneously evaluated for their costs and for the distribution and magnitude of their benefits.

17. If no action were taken during the period 1981-82 to 1986-87--that is, if subsidized food prices stayed at nominal constant levels, as several did throughout the 1970s--the food subsidy budget would increase 44 percent in real terms. By 1986-87, it might cover 12 percent of the total government budget, or a third of the fiscal deficit. Foreign exchange required for basic food imports at a constant exchange rate would rise about 60 percent. These fiscal and foreign-exchange effects would further increase domestic inflation and the devaluation of the Egyptian pound on the open market. A most drastic scenario in which it is assumed that real prices of bread and flour increase by 50 percent and all other subsidized food prices apart from the *tamveen* (ration) increase to international levels--thereby removing the subsidy on them--yields a reduction in subsidies of about half as compared to the no-action scenario. However, the effects on foreign exchange savings are much less impressive at first glance than the fiscal effects; saving of only 11 percent is expected. This is a result of high substitution effects between commodities if their price ratios change. However, the potential revaluating effect of reduced subsidies for the exchange rate might still be substantial as a result of the monetary effects of subsidies and their impact on deficit financing.

18. A scenario designed roughly along the lines of policy changes now being considered reveals that in real terms only minor fiscal savings--10 percent of food subsidies--might be achieved. This scenario also indicates a serious administrative difficulty in the price structure; since the most important food prices are set by the government, the mechanism for altering them is cumbersome, and price changes may only keep pace with inflation rather than outstrip it. The analysis shows that significant fiscal savings may be obtained only by substantial modifications of the price subsidy on bread and flour and the subsidies paid to customers of the cooperative shops--e.g., for meat and poultry and for macaroni, or by targeting. The latter can both reduce the costs of the system and reduce underconsumption. A degree of leakage must still be expected, both for administrative reasons and because the cut-off point for a poverty line must be subjective.

19. Objectives of self-sufficiency in food, especially cereals, are a principal driving force behind demands for corrections in food price policy. Solving the perceived problem of increased dependence on imports by promotion of the domestic food supply has been only partly successful in the past. Yet an attempt to solve the problem by curtailing effective demand by means of consumer price policy measures would not provide a feasible method for meeting self-sufficiency goals. Substantially cutting subsidized grain prices in other scenarios would bring about a maximum reduction of about 11 percent in the consumption of cereals. This would increase self-sufficiency in cereals from about 44 percent to 49 percent by 1986-87.

20. Food policymakers should be prepared for the surprising side effects of changes in subsidy policies that are being considered. A case in point is the probable response of the rice market to changes in the wheat, bread, and flour subsidies. A substantial cut in wheat subsidies would certainly induce a rapid increase in the consumption of rice even if rice were not subsidized. In the relevant scenario, rice would be an important import crop, of which about a half million tons would be imported annually. Of course, the rice trade might be constrained by government policy. Yet it is evident that under such a policy--restriction of rice imports and reduced price subsidies for wheat--rice might finally become a protected subsector in agriculture, since consumer prices of rice on the open market tend to translate into equivalent farmgate prices for producers. Such a further distortion of farm prices would affect resource allocation in agriculture adversely in the long run.

21. Nutritional status seems to be either constant or in general better under the optimistic assumption of high income growth. The effects of income growth are either reinforced by reductions in food prices or they roughly counterbalance the impact of substitution away from more expensive grains. Only under a scenario with pronounced changes in real prices, and then only for the rural poor, is the proportion of malnourished expected to increase. The absolute number of families that consume less than the calories required decreases for both sectors in most scenarios. In the no-price-change scenario, it remains roughly constant in the urban sector. Conversely, when income growth is low, a noticeable decline in the adequacy of calorie intake can be anticipated following significant increases in real prices. Furthermore, even when real wheat prices decline somewhat, population growth nearly offsets the decline in the number of families at risk of underconsumption that is attributable to income and price changes. This possibility should also be addressed when the national income increases at a high rate but the effects on the poor are somewhat less. If the economic possibilities of the coming years are not evenly distributed to the urban and rural poor, then the nutritional impacts of changes in subsidies should resemble those of the low-growth scenario.

22. It is clear that the distribution of total benefits from the subsidy system vary among the scenarios. The relative responsiveness of the rural sector in general and the poor in particular to changes in prices and income accounts for greater changes in that sector when prices or incomes increase. Similarly, with larger shares of the budget allocated to flour and bread, the rural poor see a greater decline in their real income when prices rise. In addition, since the present system has many components, some of which benefit the urban sector more than the rural and others that are relatively well distributed in favor of the rural regions, the selection of which programs to modify alters the distribution of benefits.

23. Compensating wage hikes for the public sector may make subsidy cuts politically more palatable, but they reduce the fiscal savings with little nutritional benefit. Furthermore, they are not noticeably directed toward the poor and they increase disparities in urban-rural income.

Finally, it should be recalled that food subsidies are only one of many instruments used by the government to meet its diverse goals. Changes in other arenas--for example, in energy pricing--will also have significant impacts on the general economy and indirectly on food consumption.

3. SYSTEMS OVERVIEW: GOALS AND MANAGEMENT

The Egyptian system of food subsidies and rationing has a variety of components. The descriptive assessment of the operation of the system, of the institutions that govern it, and of the quantities of food and fiscal operations involved turned out to be a research task in itself.¹⁰ Fulfillment of this task was made possible by intensive interaction and collaboration with government institutions from the beginning of the research project, for much of the systems set-up is not documented in a way that makes it easily accessible. Complex legal and administrative regulations are the basis for the implementation of its components.

The range of food subsidies grew significantly during the 1970s, but the administrative foundations had been established in earlier decades. Rationing of both food and nonfood commodities was introduced during the Second World War. Similarly, an assortment of sales on the open market, controls over cultivation, price ceilings, and price subsidies have been introduced regularly in Egypt. To a large extent, such measures have been regarded as instruments to stabilize domestic prices when local food supplies were short and to insulate the domestic market from wide fluctuations on the world market.

In 1973 Egypt began to open its economy, seeking greater exposure to the world market and greater foreign investment. At the same time the world prices of basic food commodities rose. As its population and reliance on imports increased, Egypt needed to increase its subsidy outlays substantially to continue to insulate its consumers from world market prices. Although the rise in commodity prices proved temporary, pressures on Egyptian foreign exchange led to a staged devaluation from 1977 to 1979 and again in 1981. This increased the domestic cost of imports so that subsidies took on an additional goal of moderating the effects of inflation in a rapidly growing economy that relied to an increasing extent on imports. Egyptian efforts to stabilize the real earnings of public-sector workers who were on relatively fixed incomes evolved to become a cornerstone of its welfare policy. Not only were there fiscal causes of an increase in outlays, but rising incomes, declining relative prices, a growing population, and improved marketing in rural regions all increased the volume of subsidized goods consumed. For example, the volume of wheat flour and sugar distributed by the government increased 100 percent between 1971 and 1980.

Imports and exports of most food commodities are largely determined by administrative policy in Egypt. Government agencies have total authority over imports and exports of all important food commodities. Food trade is not highly sensitive to international prices, as empirical evidence shows.¹¹ The primary determinant of food trends is a government plan that defines food needs, which is set up annually in a complex administrative procedure coordinated by the Ministry

¹⁰ Alderman, von Braun, and Sakr, Egypt's Food Subsidy and Rationing System.

¹¹ Grant M. Scobie, Government Policy and Food Imports: The Case of Wheat in Egypt, Research Report 29 (Washington, D.C.: International Food Policy Research Institute, December 1981).

of Supply and Home Trade. Social and regional administrations are involved in the process, as are various ministries as well.

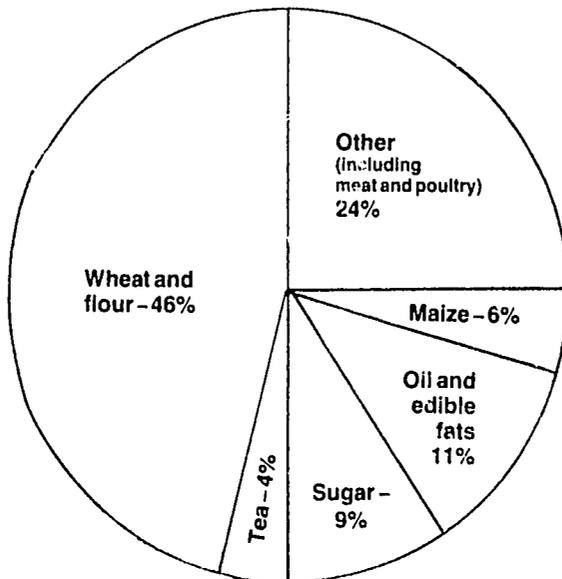
Imports and the part of domestic procurement that is not exported are allocated to regions and districts on a quota system. A consumer holding a ration card is assured monthly rations of sugar, tea, cooking oil, and rice at subsidized prices. In addition, further quotas are provided at a second set of prices, which are higher but are usually, but not always, lower than world prices. For example, 750 grams of sugar per person a month were authorized at the equivalent of US\$0.14 per kilogram and an additional 750 grams were provided at US\$0.43 in 1982. These prices did not change at either the peak or the trough of the price cycle. Beans and lentils are also provided to card holders but not necessarily every month. Although there are some restrictions on eligibility, about 90 percent of the population are registered in the ration system.

In addition to what is provided through these quotas, further amounts of these commodities are distributed at the second tier of prices through cooperatives. Allocation to districts is by quotas, but individuals are neither guaranteed nor limited to regular amounts. Because prices at the government-controlled food outlets are rigid, price mechanisms on rather small open markets have to adjust supply to excess demand. Moreover, waiting lines and other search costs do influence the final distribution of goods among consumer groups and represent net social loss.

Frozen meats and poultry are also sold through cooperatives with monthly quotas. These quotas are not enforced strictly and there is a resale market.

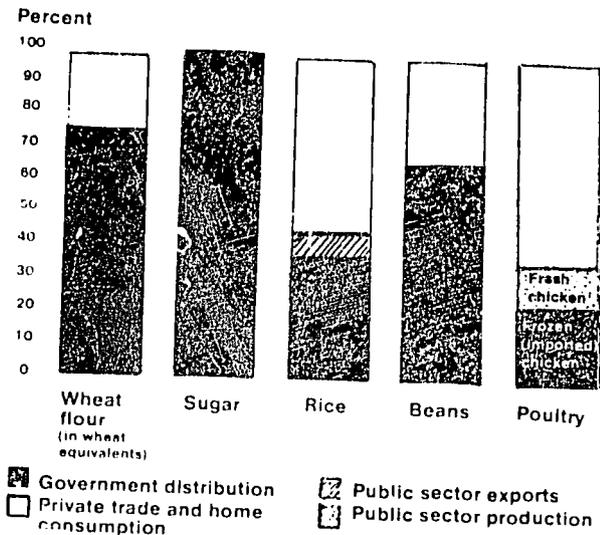
The main commodity in the ration system in fiscal terms is wheat (see Figure 1), which is provided to consumers either as subsidized bread or as flour. Purchasing wheat in the form of bread is more prevalent in urban areas, whereas in rural areas it is more commonly purchased as flour. There are no quotas on bread, but district and village councils are authorized to institute limits on monthly purchases of flour from government stores as they see fit. Maize is also provided to farm households and industry at rationed prices. However, yellow maize can be considered an input subsidy because it is rarely consumed by people in Egypt but is used as livestock feed.

Figure 1--Shares of Total Expenditures for Food Subsidies by Commodity Group, 1980-81



There is a legal open market for agricultural produce, but domestic trade in agricultural commodities is highly restricted. Farmers are obliged to sell all their cotton and sugarcane to the government and a portion of their rice, beans, lentils, and some other crops as well. Prices for local trade in these commodities are generally higher than either government procurement prices or consumer prices at the cooperatives. Market channels for private trade are rudimentary, and prices vary among villages. For many commodities, the greater part of the volume of trade goes through government distribution channels (see Figure 2).

Figure 2--Percentage of Total Consumption of the Principal Commodities by the Government, 1980



One of the goals of the government's distribution system is to cope with the underdeveloped private market channels. This goal reinforces distributional objectives and has contributed to a recent pattern in which much of the food consumed in rural areas is either imported or transported from other regions in Egypt. Regression analysis indicates that distribution of grain by the government supplements local production in a manner that tends to smooth regional consumption of grain per capita. The regional marketing and distribution patterns of the government-controlled food system and its commodity-specific features do not fit the simplifying hypothesis of a general urban-biased system.

Private market channels could hardly bear a burden the size of the present volume of trade in the short run without friction in the regional distribution system of goods now subsidized and rationed. The government has had years of experience in administering the massive quota system. Consequently, the loss of administrative experience must be considered a cost of changing the present system of food distribution from the public sector to the private sector, at least in the short run.

4. MACROECONOMIC IMPLICATIONS AND IMPLICATIONS FOR TRADE

A broad approach must be taken in order to highlight the function of the subsidy system in the economic and political changes that have taken place in Egypt during the 1970s.¹² Since 1973 Egypt has undergone a series of important economic and political changes. At the time of the October War with Israel, the economy had been supporting a major military effort for eight years. Real personal incomes had grown little, if at all, for much of the population. Per capita consumption of wheat, the major staple, had fallen. Since the Suez War of 1956, the economic and political leaning of Egypt had been dominated to a growing extent by its relations with the countries of the Eastern bloc. Trade, much of it bilateral and even barter, had been with Eastern Europe and the Soviet Union. Foreign investment and aid from Western countries had all but dried up. Systems of planning and management that placed heavy emphasis on the materials planning approach and the use of centralized controls had evolved. Little reliance if any was placed on the use of market signals as allocative devices. The economy had faced severe restrictions on foreign exchange, and the import of investment goods had been neglected so that war materials could be acquired.¹³ As a consequence, the immediate postwar outlook was bleak--a large bureaucracy, a depleted capital stock, shortages of parts and raw materials, and foreign debt repayments beyond the capacity of the country to generate foreign exchange. There is evidence that foreign policy and economic concerns were closely linked throughout this period.

In 1956, the nationalization of the Suez Canal and the appeal to the Soviet Union were Egypt's response to the necessity of gaining control of the resources needed to build the Aswan High Dam and expand agricultural output. The action was in large part precipitated by the refusal of the United States and the United Kingdom to back a loan for the extension of the dam. Furthermore, the need for economic support from other Arab countries was not unrelated to political and military decisions. Sadat reported that the country had reached the "zero stage" economically in 1973 and could not have met debt repayments or purchased foreign wheat in 1974. "But as soon as the battle of October 6 was over, Arab brethren came to our aid with \$500m--this sum would never have come had we not taken effective action as regards the battle."¹⁴

Economic and political motives were clearly intertwined in all these maneuvers, and they continued to be. The economic policy that evolved after the October war placed new reliance on restoring trade and investment with Western countries and private economic activity in the domestic sector. These strategies

¹² This chapter draws heavily upon Scobie, "Food Subsidies and the Government Budget," and Scobie, Food Subsidies in Egypt.

¹³ From 1967 to 1973, imports of food were significantly lower and chemicals higher than in other years. See Scobie, Food Subsidies: Their Impact on Foreign Trade and Exchange in Egypt.

¹⁴ Quoted by John Waterbury, "The Opening," American University Field Staff Reports (Northeast Africa) 20 (1975): 1-8.

were formally cast in the form of Law 43 of 1974 and have become known as *Al-infintah*--"the opening." It was both an economic and a political opening.

At first glance it is ironical that the new economic order, with its greater reliance on market signals, foreign trade and investment and private economic activity, has been accompanied by burgeoning consumption by the public sector. It was the announced policy of the public sector to withdraw from some of the areas it had dominated. While public consumption as a proportion of gross domestic product had grown only modestly, expenditure on subsidies now represents a significant share of public consumption expenditure.

There has been a tendency to attribute this increase to the rise in commodity prices during 1973-74. Certainly subsidy expenditures rose during these years, but more important, they did not subsequently decline. The growth in real expenditures on subsidies per capita fails to support the hypothesis that the large rise in subsidy expenditures was simply a transitory phenomenon associated with a temporary rise in world market prices.

The economic opening has in effect been coupled with a corresponding political opening, in which an increasingly vocal and powerful populace has strengthened the commitments of the government to social policies whose origins lay in the 1952 revolution. Their expression had simply been quelled by the long periods of hardship imposed by military endeavors. The strength of those forces has been demonstrated in the reaction to attempts to limit their access to economic and political power--for instance, in the food riots of January 1977.

Food Subsidies and the Government Budget¹⁵

The large share of total revenues in Egypt comes from indirect taxes, which comprise taxes on goods and services, taxes on foreign trade, and consumption excises. Such dependence on indirect taxation reflects ease of collection rather than ability to pay.

Taxation has kept pace with economic growth but has not shifted significantly during the decade, as indicated by a GDP elasticity of 1.03. Personal income taxes have remained a minor portion of the tax burden; their share of government revenues declined from a high of 3.6 percent in 1973 to 1.8 percent in 1978. During this period private incomes of professionals and entrepreneurs grew while the ability of the government to monitor and tax such incomes lagged.

In recent years, however, taxes on business profits have risen faster than GDP. Much of the revenue comes from the petroleum sector and the Suez Canal. Assessment of profits of businesses in the private sector is weak, and profits in the public sector are fairly small, even if easier to tax. Property taxes have remained nearly constant in nominal terms despite inflation and a significant real estate boom.

Taxes on goods and services are one of the principal sources of indirect tax revenues. Their share of GDP declined from about 5.5 percent during the early 1970s to around 4.5 percent during the later 1970s. The excise tax structure has been characterized by a widespread use of specific duties--as opposed to ad valorem duties--a narrowly based tax structure, and considerable latitude given to public enterprises in assessment of sales taxes and timing of payment. In July 1981, the government passed a new consumption tax law in an effort to unify tax

¹⁵ This section is based on Grant M. Scobie, "Food Subsidies and the Government Budget in Egypt," Working Paper on Food Subsidies, no. 2 (Washington, D.C.: International Food Policy Research Institute, 1985).

rates between domestically produced and imported commodities, to unify tax rates on the same commodities, and to base taxes of imported commodities on their value.

Taxes on foreign trade are the primary source of indirect tax revenues, and their share in GDP has tended to increase considerably because of the rapid growth of imports after 1974 and the progressive devaluation of the Egyptian pound.

Since the mid-1970s a marked recovery has taken place. A more open economy, greater investment, resumed flows of aid, and substantial foreign-exchange earnings--from petroleum, the canal, tourism, and remittances--have all contributed to a doubling of the real per capita command over resources since 1970. It is important to note that real investment and private consumption have risen more rapidly than public consumption.

In real terms the expenditures on subsidies per capita have also risen substantially. The impression of burgeoning public expenditures on subsidies is reinforced by noting their increased share in gross domestic product (10 percent), in total public consumption (60 percent), and as a share of gross investment (50 percent) (see Table 1).

Table 1--Share of Subsidies in Gross Domestic Product, Investment, and Public Consumption^a

Year	Real Subsidies per Capita (Egyptian pounds)	Gross Domestic Product (percent)	Gross Domestic Investment (percent)	Public Consumption (percent)
1950	0.8	1	7	6
1955	0.4	0	3	3
1960	0.8	1	6	5
1965	1.9	2	8	8
1970	1.0	1	6	3
1975	16.8	13	47	51
1979	22.0	11	48	58

^a These subsidies are purely the recorded subsidies in the government accounts. There are a host of indirect subsidies to the food sector arising from multiple exchange rates, subsidized prices of agricultural inputs, irrigation water supplied without charge, cheap credit, and price controls on fields. It would probably not take an overzealous social accountant to double the figure reported as trading losses of the General Authority of Supply Commodities.

Source: Grant M. Scobie, "Food Subsidies and the Government Budget in Egypt," Working Paper on Food Subsidies, no. 2 (Washington, D.C.: International Food Policy Research Institute, 1985).

How has it been possible to accommodate these rises in expenditures on subsidies? The answer lies principally in the expanded total command of resources that the Egyptian economy has enjoyed since 1973. Between 1970 and 1981 subsidy expenditure rose rapidly in nominal terms. However, the real available resources grew by LE 140 per capita during this period; the real increase in subsidies was about LE 20 per capita. From 1975 to 1981 the growth in resources was about LE 120 per capita, while real subsidies grew by LE 7 per capita. In other words,

during the period of rapidly expanding subsidy expenditures, only 6 percent of the increase in total available resources was dedicated to increased subsidies.

Investment and Subsidies

It is clear that expenditures on subsidies per capita by the central government have risen substantially in real terms. This came about during a period of notable changes in the economic and political climate. It is pertinent to inquire into the consequences for public and private investment. Was this rise in consumption expenditures met by sacrificing investment? Were present consumption levels simply reducing growth and mortgaging future income streams?

From Table 1, it is evident that subsidies represent a larger share of public consumption and have grown substantially in relation to gross domestic investment. Real public investment per capita doubled between 1965 and 1979. The effect of the 1967-73 conflict is evident in the real decline in public investment noted during those years. Certainly, real public spending per capita on subsidies rose even faster than investment, suggesting some diversion of resources toward current consumption. However, overall public investment has risen faster than public consumption expenditures. After a decline during the war years, public investment was increased at a more rapid rate than was total public consumption. This implies that the growth in subsidies has come not at the expense of investment so much as at the cost of growth in other public services. It is of interest to note that the period since *Al-infitah* has corresponded to a sharp rise in the ratio of private investment to public. This is entirely consistent with the goals of the revised economic policy.

The mix of public expenditure has changed, placing greater emphasis on investment and subsidies and less on defense and other services. Investment and subsidies in 1979 accounted for almost 80 percent of total government expenditures, whereas in 1965 they represented only 37 percent (see Table 2). The mix of public expenditures has been highly responsive to the new economic and political climate.

Table 2--Shares of Defense, Fixed Public Investment, and Health, Education, and Community Services in Total Government Expenditures

Year	Defense	Fixed Public Investment	Health, Education, and Community Services	Subsidies
(percent)				
1965	23	34	12	3
1970	33	31	19	2
1975	24	42	12	25
1979	13	50	11	26

Source: Scobie, "Food Subsidies and the Government Budget in Egypt."

There does not seem to be any strong evidence that increases in subsidies have come at the expense of investment.¹⁶ If public investment is taken to include expenditures on health and education--investment in human capital--then the recent trends toward larger subsidies have not outstripped investment. Of course, if all the increase in subsidy expenditures had been dedicated to investment, then total future growth and incomes would be higher. But the same argument would apply to any other element of government expenditure.

The proportion of total use of resources in the public domain rose from less than 20 percent during the 1950s to about 35 percent at the end of the 1970s. However, the ratio changed during the 1970s, along with the mix of public expenditures for consumption. The public sector has grown and now controls a greater proportion of total resources than at the time of the revolution. As the relative political strength of claimant groups has varied during the last decade, so have both the mix of public activity and the ratio of public activity to private. The state has become more concerned with transfers than is the private sector and less with production and investment.

It is of course true that some of the freedom that made this possible has come from foreign loans and grants. A significant proportion of the rise in Egyptian resources has come from net factor income, largely remittances, and export receipts, from the Suez Canal, petroleum, and tourism. Even if all the subsidy expenditures had been financed from foreign grants and borrowing and net factor income from abroad, they would have required less than half the increase in the last decade. These resources have naturally given the government greater freedom to respond to the political pressures for claims on resources; but it would be a gross overstatement to claim that Egypt has simply consumed the additional resources. Substantial rises in investment have occurred simultaneously. In fact the rise in expenditures on subsidies, while of itself dramatic, has not been out of keeping with the growth of investment and consumption expenditures.

Food Subsidies: Imports, the Exchange Rate, and the Rate of Inflation

From 1973 onward the Egyptian government placed a high priority on holding down the real price of foodstuffs. This could be accomplished only by increasing the amount of imported foods. The decline in the real price of wheat has been a major feature of Egyptian food subsidies. In order to hold down the price without creating excess demand, imports have expanded from about 2 million tons to 7 million tons during the last decade.

There are a number of important characteristics of this import demand. First, it has been a large and growing share of total imports, which has made it necessary to consider the total allocation of import expenditures. Second, import demand is clearly a reflection of domestic policies concerning production and consumption. Third, all foreign trade in wheat is undertaken by a state agency, so government policies infringe directly on the volume of imports. Fourth, a large share of the imports is concessional, and it is important to recognize this explicitly. Finally, the substitution effects in both production and consumption are important and will enter the decision about internal pricing.

¹⁶ This is confirmed also by von Braun and de Haen's reporting of a high positive correlation between the time series of the shares of nonagricultural public investment and food subsidies but a negative correlation for the relatively small public investment in agriculture and food subsidies. See von Braun and de Haen, The Effects of Food Price and Subsidy Policies on Egyptian Agriculture.

For most commodities the quantities involved could not realistically have come from domestic production. During the period 1964-68 imports of food were more than LE 8 per capita. As internal economic pressures mounted during 1970-74 and supplies of foreign exchange became scarcer, food imports fell to LE 6.6 per capita. This fall occurred in spite of a rise in the unit cost of imported foods. However, since 1973 real expenditure on imported foods has risen consistently, and by 1981 it was more than LE 45 per capita (all figures in constant 1975 Egyptian pounds). A marked increase in the imports of cereals and pulses provides a dramatic illustration of this pattern. Imports of cereals and pulses per capita were 42 kilograms in 1960, 62 kilograms in 1965, 20 kilograms in 1970, 75 kilograms in 1975, and 154 kilograms in 1980. The sharp decline in 1970 reflects the heavy social costs imposed by the war and the competition for foreign exchange between food and other materials. Since the mid-1970s, the policy of making basic foods cheap and widely available is clearly reflected in the rise in grain imports per capita.

In view of these changes, it may at first glance be surprising that Scobie finds that a 10 percent cut in real subsidies per capita would reduce the volume of food imports by only 4 percent.¹⁷ This is a result of the fact that subsidies, especially for wheat, have made the real prices of foodstuffs to the consumer much lower than they would otherwise have been. At these levels of real prices the quantity demanded becomes less sensitive to price changes, and the subsidies become primarily an income transfer with little or no effect on food consumption or imports. For products such as wheat the reduction in imports would be even less. If the government wished to reduce the foreign-exchange costs of importing wheat, then limiting access to subsidized products would be more effective than reducing the subsidy per unit by letting the domestic price rise. On the other hand, real imports of commodities such as meat would respond much more directly to a reduction in the subsidy per unit.

Clearly the fiscal cost of the subsidy scheme has been substantial. In 1981 budgeted subsidy expenditures were equal to about two-thirds of the total deficit of the central government. Any attempt to reduce the deficit would necessarily require attention to the subsidy costs. These costs have been met by tax revenues, foreign aid and concessional loans, and external borrowing. However, a significant part of the government deficit has been financed by the creation of government liabilities held as assets by the Central Bank. This expansion of the net domestic credit component of the monetary base has been significant since 1973. Such an increase in high-powered money and the concomitant rise in the domestic money supply has had far-reaching economic implications.

Scobie uses a monetary model of an open economy to estimate the effect of this deficit financing on the rate of inflation, the balance of payments, and the free-market exchange rate.¹⁸ The model is based on the so-called monetary approach to the balance of payments, which has its roots in classical economic theory. The fundamental proposition is that the balance of payments is a monetary phenomenon rather than a real phenomenon. The process of adjustment involves disequilibriums in stocks of assets rather than in flows of goods, as in the post-Keynesian view. The model allows for the presence of multiple official exchange rates and the use of controls, which lead to the development of a parallel market in foreign exchange. Furthermore, the demand for real money balances, a key element of the monetary approach, is estimated explicitly within the model.

It is estimated that a 10 percent rise in government expenditures on food subsidies would, other things being equal, cause a 5 percent rise in the inflation

¹⁷ Scobie, Food Subsidies in Egypt.

¹⁸ *Ibid.*

rate, a 2 percent decline in the balance of payments, and a 3 percent decline in the value of the Egyptian pound.

The commitment of the government to food subsidies has made it difficult to reduce the amount of food imported. If the price of imported food goes up, then more foreign exchange has to be allocated to imports of food. In the past, this has meant a reduction in imports of other goods. In particular, imports of raw materials and capital goods have had to fluctuate to accommodate the need for imported food. This problem has faced many developing countries that must import food regularly. The consequences for industrial output and growth have not been clearly spelled out.

In order to examine this competition between imports for limited supplies of foreign exchange, a system of import-demand functions is estimated in which the supply of foreign exchange is allocated among the various classes of imports.

When imports of raw materials are reduced, the use of capacity in the manufacturing sector falls. In this study we found that a 10 percent rise in the price of imported food would reduce industrial output by 1.2 percent. When imports of capital goods are postponed, the growth of capital stock is impeded. A rise of 10 percent in the price of imported food is also found to cause a decline of 2 percent in gross fixed investment.

In addition to the prime effects, even more significant responses were found to accompany a decline in the supply of foreign exchange. The decline in the volume of imported foodstuffs is very small, whereas capital goods respond significantly. It appears that Egypt has endeavored to maintain the real volume of food imports and other consumer goods when supplies of foreign exchange were short. However, this has been at the expense of intermediate industrial and capital goods.

5. IMPLICATIONS FOR THE AGRICULTURAL SECTOR

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. A primary objective of the related research was to analyze the agricultural policymaking 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 from the bundle of policy goals and related instruments those that are directly or indirectly linked to food subsidies. The basis for doing so can only be provided by a complete quantitative assessment of Egypt'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, such as wheat, maize, sorghum, and meat, have been subject to considerably less interference in allocation and marketing. Prices of agricultural inputs and outputs 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 assessment of the effects of food subsidies on agriculture by von Braun and de Haen takes into account specific linkages and policy mechanisms.¹⁹

Food Subsidies and Public Spending on Agriculture

Since 1973, food subsidies, which were negligible during the 1960s, have accounted for 7 to 15 percent of total public expenditures. How was public spending on agriculture, including agricultural investment and research and development efforts, affected when food subsidies grew?

The agricultural budget, which had been declining steadily between the mid-1960s and 1974, has grown in real terms since then. The rise in public expenditures during the mid-1970s reflects the release from the war burden and a reshuffling of the economy toward a more open system that favors the private sector. GDP in real terms grew 7.3 percent during the period 1972-80, whereas during 1965-72 it had grown only half as fast, or 3.7 percent. The agricultural budget underwent far-reaching structural changes during this period. Input subsidies, mainly for fertilizer and pesticides, became a sizable component of the budget in the 1970s, whereas these commodities were taxed slightly in the 1960s.

¹⁹ von Braun and de Haen, Effects of Food Price and Subsidy Policies on Egyptian Agriculture.

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, when import prices in terms of domestic currency 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 become in effect a fund of last resort. However, if subsidies for agricultural inputs, which parallel consumer subsidies on food, are included, gross fiscal support of agriculture is no longer reduced in relation to rising food subsidies. In the last years of the 1970s and the early 1980s, fiscal support of agriculture began to be rearranged, with a sharper 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 the employment and 20 percent of the national income of Egypt. More is spent on food subsidies than on the agricultural sector.

Consequences of Government Interventions in Agriculture and Their Relationships to Food Subsidies

In analyzing the effects of price and market intervention policies on agricultural income, on the welfare of producers and consumers, and on the government budget, a 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 important agricultural commodities are included in the analysis.

The three principal 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 lower than international prices. As stated earlier, the government procures rice and wheat but not maize. Whereas procurement of rice is compulsory, with a quota per feddan, a similar regulation of wheat was virtually phased out in 1977.²⁰ Imports of wheat and maize are distributed at subsidized prices, but the wheat is channeled to consumers while most of the maize goes 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 tax burden on wheat producers. This burden may be split into three different sources: procurement, depression of the free-market price, 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 net reduction in open-market prices. Most of these gains are covered by government subsidies on imports of wheat or procured domestic wheat, and part is financed indirectly by the wheat producers.

Subsidized fixed consumer prices ranged from 28 to 58 percent of the international wheat price during the period 1965-80 and were slightly higher than government procurement prices during the 1960s. This means that 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.

²⁰ One feddan equals 1.038 acres.

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. The overvaluation of the Egyptian pound (LE) fluctuated considerably during the period of observation. The open-market rate is used as an approximation of the prevailing shadow exchange rate throughout this analysis.²¹ For calculation of losses by producers and gains by consumers, 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 these 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 donations of food aid only if all commercial exporters of wheat to Egypt were also donors of food aid, 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.

In 1980 wheat producers had an income loss of LE 134 million, which equals 26 percent of the budgeted food subsidies for wheat. The income lost by rice producers in 1980 because of rice price policy was about LE 260 million.

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 LE 64 million in 1980-81. This explicit subsidy is an income transfer to livestock producers. Its net effect on the income of the sector depends on the effect of this additional supply of maize and that of the meat price policy on meat production.

Excluding the exceptional years of the world food crisis, 1973-75, the trend in losses of real income by cereal producers has declined significantly since 1965. Domestic cereal prices were much less lower than international prices during the second half of the 1970s than during the 1960s. This means that the implicit taxation of cereal production was reduced for the aggregate of wheat, maize, and rice. The income loss per ton of cereals, in 1975 prices, dropped from an average of LE 56 during 1965-69 to LE 30 in 1977-80 (see Table 3). 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, 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 during the late 1970s, mainly because both rice procurement prices and maize prices increased. Wheat price policy did not have much effect on the change of aggregate cereal prices. Despite the decreased burden on cereal production, implicit income transfers from producers still amounted to LE 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.

Consumers received growing support through depressed cereal prices and subsidized distribution during the late 1970s, after several years of reduced transfers following the international food price crisis (see Table 3). In 1980, 78 percent of all gains by consumer on cereal markets came from wheat, 21 percent from rice, and 1 percent from maize.

The livestock density of Egypt 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 production of fodder and fodder by-products of the principal crops are important. Because almost no range land is available in the country, the opportunity cost of fodder is determined by

²¹ The Egyptian pound was US\$1.43 at the official exchange rate but US\$1.22 at the blackmarket rate in 1980.

Table 3--Producer Losses and Consumer Gains from Price Policies on the Wheat, Rice, and Maize Markets, 1965-80, in 1975 Egyptian Pounds

Year	Producer Losses, Implicit Taxation		Consumer Gains (Explicit and Implicit Subsidies)	
	Total Loss ^a	Loss per Metric Ton	Total Gain	Per Capita Gain ^b
	(million pounds)	(pounds)	(million pounds)	(pounds)
1965	342.0	66	358.0	12.2
1966	287.1	52	265.5	8.8
1967	289.1	50	226.0	7.4
1968	344.6	54	203.1	6.4
1969	373.4	60	309.6	9.6
1970	294.9	45	296.8	9.0
1971	188.5	29	169.3	5.0
1972	184.3	28	190.3	5.5
1973	415.5	63	579.9	16.4
1974	1,033.9	153	1,065.7	29.4
1975	873.3	121	875.0	23.6
1976	475.9	65	583.5	15.4
1977	166.6	25	305.6	7.9
1978	202.3	27	368.9	9.2
1979	281.3	38	516.2	12.6
1980	227.7	31	563.7	13.4

Sources: These figures were computed from data provided by the Egyptian Ministry of Supply, the Central Agency for Public Mobilization and Statistics, and the Principal Bank for Development and Agricultural Investment.

a Input subsidies (on fertilizer) have already been deducted from total losses.

b Total population is the denominator used in calculating this column.

the prices of all other crops. Since the mid-1970s, domestic meat prices have exceeded international prices, indicating that the production of meat is protected. The same is true of milk production.

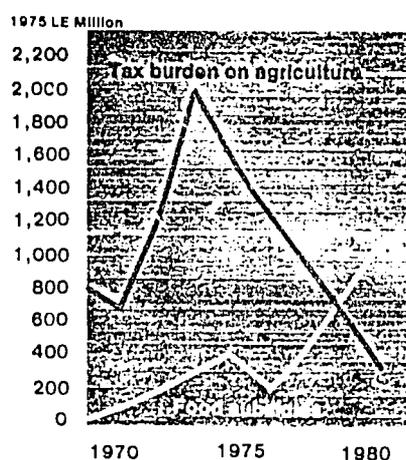
Because most of the meat is consumed by the high-income population, the price policy has important implications for equity as well. In other words, the protection of meat and milk transfers income from the urban rich to the farm sector. Taxation of most other farm products does the opposite. Farmers' gains from protectionist prices increased remarkably during the 1970s. This partially compensates 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. To the extent that 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 from one in which only the principal field crops are taken into account. The aggregation of all losses and gains of the farm sector caused by price distortions

further highlights this fact. This aggregate tax-burden on agriculture, expressed in 1975 prices, fluctuated between LE 500 million and LE 1 billion between 1965 and 1972. After an extraordinary peak in 1973-75, it dropped to about LE 350 million a year in 1976. In other words, agriculture was implicitly taxed much less during the second half of the 1970s than before (see Figure 3). The total burden was reduced primarily by reducing 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.

Figure 3--The Development of Food Subsidies and the Tax Burden on Egyptian Agriculture, 1970-80



Sources: Joachim von Braun and Hartwig de Haen, The Effects of Food Price and Subsidy Policies on Egyptian Agriculture, Research Report 42 (Washington, D.C.: International Food Policy Research Institute, 1983): 72; and Harold Alderman, Joachim von Braun, and Sakr Ahmed Sakr, Egypt's Food Subsidy and Rationing System, Research Report 34 (Washington, D.C.: IFPRI, 1982).

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

A regression model was used to arrive at a more comprehensive assessment of the contribution of each of these sectors to the total burden on agriculture. The model evaluates the hypothetical effects on the agricultural burden of the three principal policy objectives: to isolate domestic prices from international price fluctuations, to generate public revenues, and to reduce explicit food subsidies.²²

²² von Braun and de Haen, Effects of Food Price and Subsidy Policies on Egyptian Agriculture.

The results show that factors representing the domestic price stabilization objective and the availability of government revenues dominate changes in the burden. The rising bill for food subsidies either had no effect on the burden on agriculture or it tended to reduce it. The results of the estimation also reveal how important increased revenues from other sources were in the rapid decrease of the burden. The behavior of the government in the past indicates, however, that if revenues become tight, agricultural policy may be redirected to increase the burden on agriculture in order to save fiscal resources but maintain the price level of important food items distributed through public sector channels.

Food Subsidies and the Farmers

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

A comparative static approach is applied to quantify product-specific income effects of distorted prices broadly. Survey data collected particularly for this purpose are used for the analysis.²³ The patterns of losses and gains and the size of the net loss or gain are determined by the level and structure of price distortions, the farm-production structure, intensity and productivity of inputs, and the resource endowments. Production structures and input intensity are again heavily determined by the rations and levels of input and output prices, including prices of input factors such as labor. The abundant availability of family labor at low opportunity costs to small farms usually leads to higher intensity of production there. All things being equal, this may produce higher yields, and production may be directed toward more labor-intensive activities, such as those in the livestock sector.

These determinants actually establish a distinct pattern of gain or loss in the farm sector, because small farms are more concentrated in the labor-intensive livestock sector, which is protected, whereas larger farms actually lose disproportionately from larger shares of implicitly taxed crops in their production programs. Table 4 shows these patterns for three farm-size groups. It should be mentioned that not all the differences in allocation among farm-size groups are a consequence of the actual incentive structure; some may be in part the result of government-enforced area allotments, such as those for cotton, sugar, and rice.

Small farmers--those who cultivate less than one feddan--are net gainers from the distorted price structure on the production side, which adds to their gains, that is, income transfers--from food subsidies on the consumption side. For this group, losses on cereals, sugarcane, and cotton markets are overcompensated for by the gains from the protection of animal production and input subsidies, mainly those for feed. Although medium-sized farms--those encompassing one to five feddans--are net losers on the production side, these losses are less than their gains on the consumption side, leaving the group as net gainers. This is not true of farms of more than five feddans. In this group the net losses on the income-generating production side greatly exceed the income transfers on the

²³ Alderman and von Braun, Effects of the Egyptian Food Ration and Subsidy System.

Table 4--Income Transfers from Food Subsidies and Distorted Prices in Farm Households

Subsidy	Size of Farm			
	Landless Farm Labor	0-1 Feddan	1-5 Feddan	More Than 5 Feddan
(Egyptian pounds per capita a year)				
Gains and losses in production and input use				
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
Gains and losses in consumption				
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 and losses				
Percent of total expenditure	14.0	12.6	3.3	-18.8

Source: Data from a 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 = 1.038 acres.

consumption side.²⁴ For the income distribution of agricultural production 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.

A large share of the rural population derives income from part-time agricultural production activities. Even landless farm workers engage in some animal-production activities. In a classification by employment, the group of landless farm workers is the poorest of 10 groups distinguished: its mean income per capita is 32 percent less than the rural average and 62 percent less than the urban average. For them the subsidies and price distortions cause a net gain of 14 percent of their current nominal expenditure, while the larger farmers have a net loss equal to 18.8 percent of their total expenditure. This reflects the fact

²⁴ It should be noted that on-farm consumption is excluded from the balancing of gains and losses on the production and consumption sides, because it does not affect the net income transfers.

that a large proportion of the cost of the food basket purchased by the landless is subsidized; the subsidy received by this group is therefore relatively large.

Cereal prices are important to the households of the rural poor, such as landless farm laborers. The extent to which this group benefits from both the directly subsidized cereal commodities available from the distribution of wheat flour and bread by the government and the low prices of cereals on the open market is particularly striking (see Table 4). For the landless, the sum of these explicit and implicit subsidies on cereals represents 13.7 percent of their total expenditures. Given the large budget share of basic expenditure for food 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 the food situation of this group. Unlike the farm households that produce cereals or have the potential to do so, landless laborers would not immediately benefit from compensatory measures focused 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 the acquisition of subsidized cereals is important as a determinant of the levels and composition of the consumption of cereals in different types of farm household. Therefore, analyses of the effects of the availability of subsidized cereals on the production of grain, the marketing of the grain produced by the farmers themselves, and the consumption of cereals are of particular interest. The aggregate supply and disappearance balance of all cereals by farm households shows that:

- o Consumption of cereals per capita hardly increases with size of farm. The composition of this consumption, however, does vary with size of farm.
- o Subsidized cereals distributed directly by the government make up a third of the cereals consumed in rural households.
- o Upper Egyptian rural households receive about twice as much subsidized cereal from the government as do lower Egyptian households.
- o Landless households acquire about the same amount as small farm households, but with increasing size of farm, households make less use of subsidized cereals.
- o Even medium-sized and large farms purchase considerable quantities of cereals. At the same time, they sell their own produce. Market integration of farm households is generally fairly high in Egypt.

The availability of subsidized cereals in farm households decreases their own production of grain, but farm households that produce more grain make less use of subsidized cereals. Multivariate analysis shows that a bakery in the village, other things being equal, induces a reduction of 13 percent in local production of grain, and if subsidized cereals acquired by the households are increased 10 percent, the production of grain drops 0.5 percent. These production effects of the distribution of subsidized cereals turn out to be significant at the farm level after differences in size of farm and government acreage allotment for cash crops--cotton and sugarcane--are accounted for in a model analysis based on data from farm households.²⁵

Responsiveness to differences between the prices of foodgrains (rice) and of grains used as feed (wheat and maize) and the strong responses of the production of grain to prices of inputs for livestock production (straw) emphasize the

²⁵ Alderman and von Braun, Effects of the Egyptian Food Ration and Subsidy System.

impacts of livestock production on grain production. Feed demand for livestock and its price effects on cereal by-products has different impact on the various crops: maize production goes up--as additional analysis shows--while the more livestock there is on the farm, the less the total of grain production. In addition, wheat production is affected in a particular way because of the importance of wheat straw for fodder. A higher price for straw significantly increases the incentive to grow wheat. This increases the total grain output as well.

The availability of subsidized cereals turns out not to affect the grain sales of farm households significantly, but it does increase total consumption per capita. Contrary to expectations, greater use of subsidized cereals does not significantly increase the marketed surplus of grain produced on farms. It might be expected that the households would tend to substitute consumption of subsidized cereals for consumption of their own produce and thus implicitly resell subsidized bread, flour, or maize because sales of grain would be larger, but this is not suggested by empirical analysis. The main adjustment to the availability of subsidized cereals is made in consumption, not in production and sales by farm households.

6. DISTRIBUTION OF BENEFITS AND THEIR EFFECTS ON NUTRITION

Ration System

The formal rationing system is not the largest component of the subsidy bill, but it is the most widespread. Virtually the entire population--about 92 percent of all households--have ration cards, and according to the IFPRI/INP survey, most card holders have been able to obtain their quotas regularly.

For most families the goods available through the ration system are infra-marginal; the majority of families make additional purchases at the cooperative or on the open market. For example, whereas less than 2 percent of either the urban or the rural households surveyed reported that they had declined some of the sugar ration, 76 percent of the urban families and 79 percent of the rural families purchased more than the ration provided. Similarly, 55 percent of the urban dwellers and 51 percent of the rural residents purchased additional amounts of rice while less than 4 percent of either group declined the ration.

Rations, then, can be regarded as augmenting consumption through an income transfer rather than as influencing the amount consumed by lowering the marginal price. The implicit income transfer can be calculated as the difference between a reference opportunity cost, which for this example is taken as the c.i.f. price of the commodity evaluated at the official exchange rate, and the various rationed prices. This difference was multiplied by the respective amounts actually received through rationing. When the income transfer is calculated in this manner, it can be seen that the average rural resident received a transfer of LE 6.7 in 1982 while an urban resident received LE 8.7. The difference between the two sectors comes mainly from differences in quotas for oil and rice. There is a slight tendency for the absolute value of the transfer to decline with income. The analysis also indicated that larger families had smaller income transfers per person, mainly because some commodities are distributed by household rather than according to individual quotas. There is a pronounced decline of benefits as a proportion of total income as income increases; the ration transfer for the lowest rural expenditure quartile was 8 percent of their total expenditures, whereas it was only 1 percent for the highest rural expenditure quartile and less than 1 percent for the urban well-to-do.

Cross-sectional regressions indicate that increases in the availability of rations and quotas lead to statistically significant decreases in other purchases of the goods. However, for most goods, the reduction was less than the increase brought about by the ration and the accompanying income transfer. This indicates that the ration has a small but measurable effect on consumption that is not predicted by income transfer alone.

Bread and Flour

The commodity group that represents the largest outlay for the government is wheat and flour. The average urban resident purchases more than 2.6 loaves of

bread a day, the average rural resident less than half a loaf. This apparent disparity of access to bread, however, is misleading, for nearly all rural residents bake at home, while only a quarter of the urban residents do so. The rural population obtains more than twice as much subsidized flour per capita directly through government channels as does the urban population. The annual value of the transfer in bread and flour from licensed outlets that went directly to consumers came to more than LE 600 million in 1981-82. Of this, nearly half went to the rural sector. An additional amount went to consumers through restaurants and sandwich shops.

In addition to bread and flour obtained through government channels, flour obtained on the open market, which accounted for nearly half of all the flour purchased in the rural area, must be considered. Much of this flour was originally imported and sold at subsidized prices at government shops, then resold by individuals at a slight markup. This is a legitimate means by which consumers in villages without flour shops or without the means to purchase a 100-kilogram sack obtain this commodity. In addition, sales on the open market consist of flour milled from domestically grown wheat, the bulk of which is traded on the open market. Nevertheless, from evidence obtained from the household survey conducted by IFPRI and the Institute of National Planning in 1981-82, it appears that a majority of the sales of flour on the open market were at one stage in the marketing network handled by the government and therefore indirectly subsidized. When this is taken into consideration, there does not appear to be any urban bias in the subsidy on wheat and bread. Urban residents obtain an annual transfer of LE 17 per capita from the products, while rural residents obtain more than LE 12 directly through government channels and an additional LE 5 or 6 on the open market.

Quotas and shortages are both sporadic and local, so the implicit transfer from flour subsidies is determined mainly by the household demand for bread and flour. This in turn is determined largely by income. The absolute value of the transfer can be shown in multivariate regressions to be significantly and positively related to income, but, as with the ration system, the relative share as a proportion of the total expenditures declines with income. However, not every flour product is consumed in greater quantities by upper-income groups. The income elasticity for *balady* flour and bread (82 percent extraction) is negative in urban areas and virtually zero for *balady* bread in the rural areas, indicating that *balady* is an inferior good. This is not true of 72 percent extraction flour or the *fino* and *shamy* breads made from it. Given this pattern of distribution of benefits and the fact that refined breads and flours provide less than a quarter of total urban flour consumption and only 10 percent of rural consumption, there appears to be some potential for reducing the fiscal cost of the subsidy bill by reducing the subsidy on the refined product. Although regression results support this view, there is some evidence that appreciable cross-price effects would moderate the impact of an isolated change in the prices of refined flour.

Cooperatives

Although the proportion of consumers who purchase additional quantities of goods that are also available in the ration shops is roughly the same in rural and urban regions, the share that comes from the cooperative system is determined regionally. Urban residents obtain most of their additional purchases of sugar, oil, and lentils from the cooperatives, whereas the bulk of their purchases of rice, tea, and beans come from the open market.

In the rural areas, cooperatives provide only a small share of any of these goods. Consequently, the transfers obtained by rural residents from cooperatives are equal to only a tenth of those obtained by urban residents. Again, these are divided nearly equally between staples and frozen products. The average urban

resident received a transfer of approximately LE 8 annually through the subsidized cooperative system, about half of which was embodied in purchases of frozen meat, poultry, and fish at these stores. Residents of Cairo and Alexandria are not particularly favored by staples from cooperatives but do obtain a significantly greater quantity of the frozen goods, as do members of cooperatives established at work places, usually government offices or public-sector enterprises.

A principal difference between items available at the cooperatives and those from the ration system is that there are no assured supplies at the cooperatives. Although a family is not limited in the monthly purchase of staple commodities, the cooperatives do have monthly quotas that are frequently less than the quantity that consumers would want to purchase at the fixed price. For this reason lines form at the outlets, not because distribution is slow but because goods are allocated on a first-come, first-served basis. Those who arrive early gain prior rights to the goods. Late arrivals risk being confronted with empty shelves and the necessity to wait until the next shipment or pay a higher price for the item on the open market.

Such distribution by willingness to wait might be expected to benefit the poor, for whom the opportunity costs of waiting in line may be assumed to be lower--that is, they may be assumed to set a lower value on the alternative use of a unit of time.²⁶ The available data, however, do not support the hypothesis that the poor can be reached through their willingness to wait. For example, the ratio of cooperative purchases to open-market purchases is seen to be no higher for the poor than for the general population, as would be expected if the poor were more inclined to use that outlet, accounting for differences in total demand. This is also indicated by multivariate regressions that measure the response to waiting time in a manner analogous to price responses. These regressions yielded results that justified the analogy. The analysis shows that the longer the waiting time, the less likely a person was to shop at the cooperative and the more likely to purchase that good on the open market. The poor, however, were as likely to leave the cooperative market if waiting times increased as were the rest of the population; indeed, in some instances, they were more likely. The explanation for this pattern seems to come from the nature of the distribution; limits are seldom placed on the amounts purchased per visit at cooperatives. The rich, therefore, who purchase a larger bundle obtain a greater benefit from standing in line. This greater benefit offsets any possible difference in the opportunity cost of waiting.

The pattern of purchases and response to waiting times for frozen meat, chicken, and fish are similar to those for staples from the cooperative. In principle, there is a monthly limit on the amount of frozen poultry and meat that a family can obtain, although this amount is not an assured ration. A strong relation observed between income and purchases of frozen chicken, however, indicates that this regulation is frequently not enforced. Unlike chicken, more frozen fish and meat were consumed by the poor than by the higher expenditure quartile, although none of the frozen commodities was widely purchased in the city. Less than a third of the urban population obtain frozen chicken in any given month; the percentage of families purchasing, as opposed to the quantity bought, declines with income. A similar pattern was observed with frozen fish, whereas less than a quarter of the population obtained frozen meat. Less than 3 percent of the rural population obtained either frozen chicken or meat, but 11 percent were able to procure frozen fish.

Two other forms of direct subsidy contributed to the subsidy bill. The principal one, yellow maize, which added more than LE 100 million to the subsidy

²⁶ Yoram Barzel, "A Theory of Rationing by Waiting," Journal of Law and Economics 17 (1974): 73-95; Donald Nichols et al., "Discrimination by Waiting Time in Merit Goods," American Economic Review 61 (1971): 312-323.

bill in 1981-82, is actually an agricultural input, however. Whereas more than 26 percent of this maize goes to rural households through the cooperatives and is listed for human consumption, virtually all of it is used as chicken feed. The rest of the yellow maize goes to large-scale poultry farms, feed processing, and starch manufacture. The distribution of yellow maize is the most regressive item of those listed under the food category. The poorest rural quartile obtained only 14 percent of the maize distributed by the cooperatives, although they purchased 25 percent of the yellow maize sold on the open market. Maize through the latter market channel may cost as much as twice the subsidized price, although all yellow maize in Egypt in 1982 was imported and was subsidized at some point in the distribution network. Yellow maize is also a principal input into prepared cattle feed, much of which is distributed at subsidized prices in the agricultural cooperatives. The poorest quartile obtain only 7 percent of this commodity. Again, this is not because their demand is saturated, as evidenced by the larger share of more expensive open market sales of feed they purchase.

Another subsidized item in which imported wheat flour is used is *pasta*, which accounts for more than LE 60 million annually. The income elasticity for this commodity is larger than for any other subsidized food commodity with the exception of frozen chicken. This indicates that the subsidy is not primarily for the benefit of the poor.

Purchases on the Open Market

While consumers benefit from subsidies on foods directly or indirectly handled by the government, a broader picture is obtained from a look at purchases on the open market. The local prices of some open-market commodities are below the c.i.f. prices of the same goods, so the consumer receives an implicit subsidy when purchasing these goods. Open-market purchases of flour and cereals fall into this category. The open-market prices of other commodities, notably milk and meat products, but occasionally sugar, oil, beans, and lentils as well, exceed the import opportunity costs. Consumers are indirectly taxed by import and trade restrictions on these goods. The regional and seasonal pattern of the rice supply is such that it occasionally falls into the protected category, although more often the local price is lower than the potential export price. Since upper-income groups purchase more of the protected meat and dairy products, they pay the bulk of the premium attributed to the distorted prices of these goods. The principal beneficiaries of such a price system are the producers of meat and dairy products, but the producers of clover, the main item of food for cattle, also benefit. The government seldom directly captures the implicit tax on locally protected goods, except when the import price falls below the cooperative price. As discussed earlier, in Chapter 4, this transfer from predominantly urban middle-class meat eaters is distributed throughout the rural sector and partly offsets the implicit taxation of other agricultural commodities, particularly cotton and rice.

If all these components--gains and losses from government channels, purchases on the open market, and production--are netted, the price system taken as a whole is found to favor the rural community and the urban poor, although various components do not (see Table 5).

It can be seen, for example, that the rural poor gain nearly LE 19 a year from government channels and an additional LE 6 from purchases of cereals on the open market but lose LE 5 on other open-market purchases. In addition, they have a net loss of LE 1 from distorted prices in agriculture. Their average gain per capita from the pricing system, then, comes to LE 19, which is slightly greater than the average gain for the rural sector taken as a whole and exceeds the net gain of LE 13 for the urban sector. This average gain in the cities included a relatively large gain of LE 22 transferred to the poorest quartile and an imputed

Table 5--Income Transfer from Food Subsidies and Distorted Prices, 1981-82

Source of Transfer	U r b a n			R u r a l		
	Lowest Expend- iture Quartile	25-75 Percent	Highest Expend- iture Quartile	Lowest Expend- iture Quartile	25-75 Percent	Highest Expend- iture Quartile
(Egyptian pounds per capita a year)						
Government channels	27.55	29.81	31.22	18.76	18.21	23.66
Open-market cereals	0.71	2.62	1.34	6.58	11.62	19.30
Other open-market goods	-5.91	-14.85	-36.57	-5.26	-8.65	-17.59
Animal production	...	...	...	4.19	7.67	13.43
Other agriculture	...	...	...	-5.29	-9.64	-20.25
Total	22.34	17.58	-4.01	18.98	19.21	18.47
Total as percent of annual expenditures	12.86	4.66	-0.40	16.89	8.68	3.53

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

loss of LE 4 by the richest quartile, whose losses on purchases of animal products on the open market exceeded their sizable gains from subsidies and distortions in other market channels.

Nutritional Concerns

The involvement of the government in food distribution, then, contributes a significant portion of the purchasing power of the poor throughout the country, although there is little evidence that the poor are its principal target. The low prices on important food items undoubtedly contribute to the high food intakes in Egypt--intakes that exceed those of virtually every other developing country.

The lowest expenditure quartiles in both the urban and rural sectors consume, on the average, more than 2,300 calories, and the entire population reported an average consumption of more than 2,600 calories in the preceding day's meals. Slightly higher results are obtained if average calories are estimated from food purchases. Protein intake is similarly high; even when corrected for amino acid composition in all quartiles, the average intake exceeded the requirement per capita for the average family by at least 25 percent.

Flour and bread are the principal sources of both calories and protein for all income groups. In rural areas maize, coarse grains, and rice contribute about a quarter as many calories to the diet as are provided by flour and bread. In urban areas, the contribution of sugar to calories consumed exceeds that of rice. It is significant that the ration system contributes an appreciable share of calories to the overall diet, but because these are mainly from sugar and oil, the ration system is not a major source of protein. Nor is the cooperative. This is true despite the distribution of frozen meat and fish by the cooperatives.

Present high levels of protein intake would continue even if the contribution to the diet provided by all items from the cooperative were left out of the totals, indicating that there is little nutritional justification for the meat subsidy.

This point is underscored when protein intakes are adjusted to derive amino acid composition. Although the proportion of amino acids in animal products resembles that in human beings, the average diet in Egypt is sufficiently diverse that the amino acids lacking in one food item are likely to be present in another consumed at the same meal. The 24-hour food recall included in the household survey allowed for the calculation of such proportions. The results indicated that no particular problem of protein quality is apparent in the Egyptian diet and there is no need for a particular animal-protein policy.

In calculating the percentage of families that do not obtain sufficient food to meet their requirements, both variations in the sample of recorded intakes and the biological variation of human requirements must be accounted for. Accordingly, the protein requirements used in this study were determined by the average requirement for a given age and sex plus two standard deviations. The actual requirements of 97.5 percent of the population will be below this point. Furthermore, observed intakes were revised downward to adjust for digestibility.

Calorie requirements differ from protein requirements in that a person can influence the number of calories he or she requires by changing his or her level of activity. Consequently, a norm for activity must be established in order to discuss requirements. In this study, moderate activity is assumed, with a reduction of 15 percent in calorie needs to accommodate variations in requirements among individuals as well as any costless adjustments of behavior.

Using these cutoffs, 17.4 percent of the urban households and 16.3 percent of the rural households are found to have obtained fewer calories than their adjusted requirements. Protein-deficient households made up only 4.7 percent of the urban sample and 8 percent of the rural sample. It is important to note, however, that virtually no household was found to be protein-deficient that was not also calorie-deficient. This underscores the view that there is no need for a specific protein policy distinct from other elements of an overall food policy.

A portion of the apparent deficiencies in nutrients may reflect errors in measurement and family differences not related to purchasing power or prices. This view is supported by the appreciable percentage of the upper-income groups that seem to be deficient. If this level is attributed to "background noise" and subtracted from the calculated level of deficiencies for all quartiles, the urban calorie-deficient population is reduced to 10.4 percent and the rural to 11.4 percent. As expected, the bulk of the calorie-deficient population is in the poorest quartile, representing 24.0 percent of the urban poor and 32.8 percent of the rural poor.

7. IMPLICATIONS OF ALTERNATIVE FOOD SUBSIDY POLICIES IN THE 1980s²⁷

Some impacts of the Egyptian food subsidy system are quite visible, while others are best elucidated with sophisticated analytical tools. Understanding a wide range of such relations is desirable in order to appreciate fully the trade-offs between the welfare gains attributable to the subsidy system and its economic costs. With such information, planners can effectively consider options that maintain the maximum amount of benefits within the framework of other policy goals. Gathering relevant data and modelling the effects of various food policies on consumer behavior and agricultural production--and analyzing their impacts on foreign trade and other macroeconomic indicators reported in the above chapters as well--was the first step of this process.

In order to be of greater assistance to planners, however, it is useful to devise an analytical framework for evaluating the impacts of policy options and presenting these impacts in an integrated manner.

Such an evaluation will be presented in this chapter, in which possible modifications of the instruments of the food subsidy system will be studied. The emphasis on instruments is an important one: while policies reflect national goals, they are implemented only through instruments. The former can be abstract and individually varied in planning models; the latter generally exist only in complex interaction with other instruments designed for a variety of goals. Thus, while a government may institute a policy of, say, subsidized input prices or consumer prices, or price ceilings and floors for outputs, such prices cannot be set by fiat. Whether such price policies are income transfers for the population as a whole or rents to only a few, or whether they affect the marginal allocation of consumers and producers, depends on the instruments used to support or defend these prices. The analyst, then, must be aware of quantity restrictions and administrative procedures, as well as of market prices.

The approach used here does not presume knowledge of the priorities of the Egyptian government nor does it presume the value of trade-offs between economic efficiency and social distribution goals. Rather, it presents a variety of indicators from a set of scenarios that serve to illustrate social choices. More specifically, the indicators used here serve to evaluate the effects of changes in food subsidy policies for:

- o the food subsidy budget,
- o the foreign-exchange situation,
- o inflation,
- o the exchange rate,
- o food consumption and nutrition, and
- o income distribution.

²⁷ Much of the material in this chapter is drawn from Alderman and von Braun, "Egypt: Implications of Alternative Food Subsidy Policies in the 1980s."

The number of scenarios presented constitutes only a small menu--a representative listing that can be adapted to a richer array of options. Planners can choose from this list according to their collective notion of national objectives, even if such a weighting cannot be stated explicitly.²⁸ The underlying concepts of policy evaluation used will be elaborated in the following section.

Framework of the Evaluation of Alternative Food Subsidy Policies

As discussed earlier, in Chapter 3, food subsidies affect the deficit at the margin, which, in turn, affects the rate of inflation and the value of the Egyptian pound. From this standpoint, subsidies are *fiscal costs* and also contribute to a number of *economic costs* on the macro level. On the other hand, these costs are not incurred in a vacuum. By means of such expenditures, the government is able to reduce the price of a number of goods and, in so doing, to transfer resources back to the populace as well as increase consumption of a number of food items. It is, however, insufficient to compare the value of the fiscal costs with the value of the transfer. In general, there is no reason to tax a population either directly or indirectly in order to return such revenues by means of a subsidy unless the government envisions some externalities not captured by consumers when purchasing foods according to their individual preferences or unless the government seeks to redistribute resources. Accordingly, the distribution of the benefits, along with the total level of benefits, is an important factor in the evaluation of transfer programs. Also, if the government seeks to increase consumption of certain goods beyond the expected level in the absence of a specific intervention, then the level of that consumption as well as the value is relevant.

In the specific framework presented here, the principal indicator of cost is the fiscal outlay for the food subsidy system. The deficit is, of course, also of interest and will be presented, but the relations among changes in the deficit following changes in the subsidy system depends upon other spending policies as well as on revenues and can only be assumed in this exercise. Another financial indicator that is affected by subsidy policies is the total amount of foreign exchange allocated to food imports. This measure is of direct concern to planners because it determines the ability to import investment goods and industrial inputs as well as other consumer goods.

Using the parameters estimated by Scobie, the net change in inflation and the value of the Egyptian pound can be calculated roughly from estimates of the change in subsidy expenditures.²⁹ The latter are presented as the value of the pound in relation to its value in the base year and not as an absolute estimation of the (shauw) rate of exchange within the complex system of multitiered official and unofficial exchange rates. The former is also expressed as an *increment* to or *decrease* in the existing inflation rate.

The effects of policy changes on nutrition are indicated by the number of families that consume less than 85 percent of the calorie requirements adjusted for family size, age, and sex composition. Because of individual variation in level of activity and basal metabolism as well as temporal variation in intakes, there is always uncertainty in the relation of consumption indicators to the true

²⁸ Michael Roemer discusses such an approach of alternative strategies in "Planning by Revealed Preferences: An Improvement upon Traditional Methods," World Development 4 (1976): 775-83.

²⁹ Scobie, Food Subsidies in Egypt.

levels of underconsumption.³⁰ However, the change in this indicator in relation to the baseline level should serve as a measure of the nutritional impact of the various scenarios.

All the scenarios include an assumption of trend-level growth in household expenditures, with the growth rate constant across income groups. Under various scenarios, however, the transfers from the government to the consumers through price policy will change. A planner who is interested in the redistribution aspect of the subsidy system can use this information to assess relative transfers to different sectors of the population.

The study is an exercise in comparative statistics and is subject to the limitations of such an approach. For a number of reasons, it is, by design, a short-run evaluation. First, the framework takes as given a number of factors--for example, income growth rates and growth in agricultural productivity--that are based on historic rates. The further one projects from the base period, the less accurate such trends are likely to be. In a similar vein, the parameters used are estimated as marginal responses. While they maintain some validity for estimating the orders of magnitude of a change following significant changes in prices and incomes, there is clearly little to be gained in carrying the projections far beyond the base year. The purpose of the study is to report relative positions of indicators under different policy options, not to forecast exact figures for imports or consumption far into the future.

The short-run scenarios also do not reflect any consideration of the possible effect of modifications of subsidy policies on investment and, hence, on the rate of growth. Given the lead time implicit in planning and implementation, such investment is not of serious consequence for the period under investigation. Similarly, if income growth or subsidy policies affect population growth, the departure from trend projections is assumed to be unimportant in the short run. The framework is described in Figure 4.

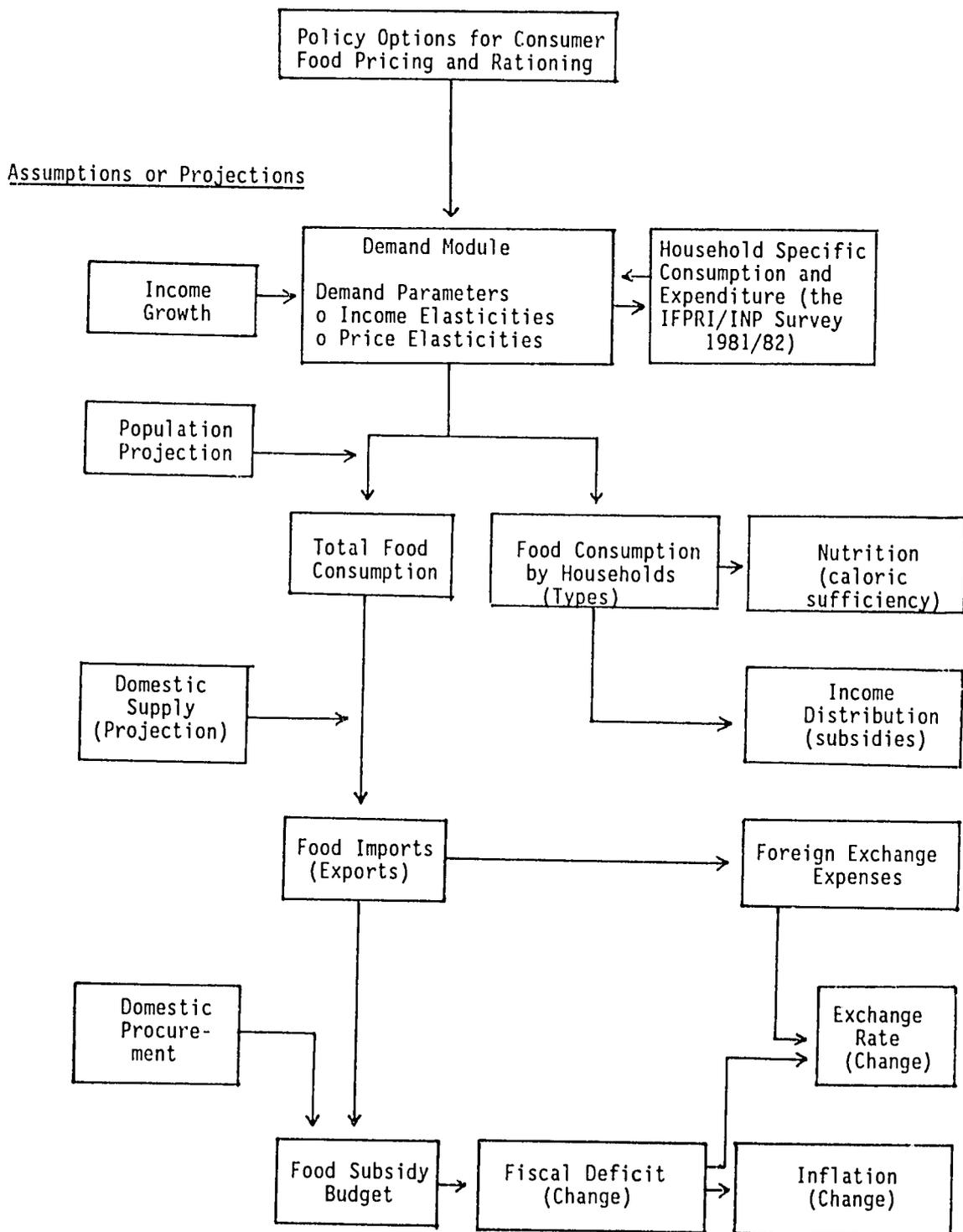
Specifying Policy Options

Policy options are specified by defining alternative scenarios for government-controlled food prices at the consumer level. These include the prices of the following commodities:

- o sugar
- o cooking oil
- o rice
- o beans
- o lentils
- o frozen meat
- o processed chicken
- o processed fish
- o *fakher* flour (72 percent extraction rate)
- o *balady* flour (82 percent extraction rate)
- o noodles and macaroni
- o *fino* and *shami* bread (from flour of 72 percent extraction rate)
- o *balady* bread (from flour of 82 percent extraction rate)
- o *fuul*
- o *tamia*

³⁰ See the review by George Beaton, "Energy in Human Nutrition: Perspectives and Problems," Nutrition Review 41 (1983): 325-340.

Figure 4--Framework of Analysis of Alternative Options for Food Subsidy Policies



The price changes for the specific formulation of policy options are applied to the respective outlets through which commodities are acquired by consumers--ration shops, cooperatives, bakeries, and flour shops. The formulation of policy options for pricing is combined with an assumption about the growth of income and the general rate of inflation in the period during which options were analyzed. These are the main inputs for the demand module, which is the core of the framework.

The Demand Module

The demand module is essentially composed of the set of parameters that represent the response of consumers in food consumption to changes in income and prices. The relevant elasticities are specific to the low-income families (the lowest expenditure quartile) and the rest of the population, each broken down into its rural and urban segments. The demand parameters are estimated on the basis of the household consumption and expenditure data collected in the IFPRI-INP survey during 1981-82.³¹

Since the survey is of a cross-sectional nature, no price elasticities could be estimated for bread because of the countrywide invariance of bread prices by type of bread. Therefore, price elasticities of bread were taken from a different source and adjusted for consistency with the price elasticities for flour, estimated on the basis of the IFPRI-INP survey.³²

As indicated in Figure 4, the demand module not only draws its analytical contents from the survey but also uses the consumption, expenditure, and demographic information for each of the options analyzed. It has obvious advantages for consistency in that the estimated parameters are applied to the source of disaggregated data from which they were originally derived.

Consumption, Nutrition, and Income Effects

The primary outcome of the demand module is the volumes and structures of food consumption by households given the assumptions of prices and incomes used in the underlying scenarios. From this, an indication of the nutritional adequacy of the calories consumed in the diet is derived and compared with accepted minimum levels.

In addition, the estimation of food consumption by type of household--that is, by income level--and in particular, the acquisition of subsidized food by the household, take into account the income distribution effects of alternative subsidy and pricing policies.

In view of food consumption patterns and the different access to subsidized food of various population groups--that is, by income level, employment, and rural or urban residence--and of the fact that consumers' responses to changes in subsidized food prices differ accordingly, any changes in food price subsidies may

³¹ Details of the estimation procedure and the data base are provided in Alderman and von Braun, The Effects of the Egyptian Food Policy and Subsidy System.

³² The basis of this is a complete demand system estimated with household expenditure and price data from the Central Agency for Public Mobilization and Statistics for 1958, 1965, 1975, in Joachim von Braun, Ernaehrungssicherungs-politik in Entwicklungs-laendern: Oekonomische Analyse am Beispiel Aegyptens (Kieler Wissenschaftsverlag Vauk, 1984).

produce different changes in the cost of living for different segments of the population.

Import Requirements, Fiscal Effects, Foreign Exchange, and Inflationary Effects

The second outgrowth of the demand module leads to a set of macroeconomic indicators. First, national food consumption is estimated from household-level consumption in combination with population projections. Second, import requirements and the related foreign-exchange account are derived from total consumption contrasted with domestic supply. It should be noted that a simplistic approach to supply from domestic production, which may be only justifiable on the basis of the short-term nature of the scenario analyses, is taken here.³³ Treating trade as residual may be justified, since government-controlled trade in food is largely determined by consumption objectives, as implicitly formulated by the price subsidy and rationing policy.

In a third component of the framework (see Figure 4), the fiscal food subsidy budget is derived given the domestic and international procurement and trade, its product-specific prices, and its consumer prices, including handling costs. Finally, the potential implications for the fiscal deficit of a change in the food subsidy budget are accounted for. Implications for the rate of inflation and the exchange rate are derived from that. Implicit elasticities estimated by Scobie are applied for these purposes.³⁴

Specific Assumptions and Projections

The framework is based on a number of assumptions and projections, which will be spelled out in order to assess the potentials and limitations of the approach.

Demand Parameters Used and Their Application

Two important features of the actual application of the income and price elasticities will be stressed:

1. In quantifying the consumption effects of changes in income, the changes in income transfers caused by changes in the subsidy rates--that is, for frozen animal products and wheat products--are considered for their effect on real purchasing power, or income.

2. Price elasticities are applied to the marginal purchases by individual households of each of the rationed or quantity-controlled commodities as actually observed in the survey. For example, a change in cooperative prices affects only the marginal purchases of families who purchase there. Similarly, when a family purchases quantities greater than the rationed amount, a change in rationed prices affects only their real income, not the marginal price. Therefore, in the demand module, it is determined whether a household purchases, say, sugar only at the ration shop, at the cooperative, or on the open market, and then the price

³³ The supply response issue is discussed in further detail in von Braun and de Haen, Effects of Food Price and Subsidy Policies on Egyptian Agriculture.

³⁴ Scobie, Food Subsidies in Egypt.

elasticity is applied, taking into account the difference between the marginal price and the price assumed for the policy option under consideration.

Assumptions about Population Growth and Urbanization

It is assumed that population growth declines from 2.9 percent a year in 1982 to 2.5 percent thereafter. The degree of urbanization is assumed to follow the trend of 1966-76 during the period of scenario analyses till 1986-87. It is also assumed that the number of Egyptians abroad remains constant at the 1981 level. This population is excluded from the estimates of domestic demand. The assumptions about population are the same for all scenarios that will be analyzed later.

Assumptions about Domestic Food Production and Procurement

As stressed earlier, the supply side of the framework is simplistic, largely serving accounting purposes. Its exogenous treatment, however, is not too unrealistic given the focus of the analysis on consumer price policy. Evaluation of the relations between consumer price subsidy policy and agricultural policy--that is, price policy for producers--reveals fairly weak linkages between the two, which may also translate into only marginal supply effects, at least in the short run.³⁵ Basically, growth in food production by individual items during the period of analysis, 1981-82 through 1986-87, is assumed to follow the path of the preceding period, 1975-76 through 1980-81. Details are given in Table 6. Under the assumption of a static cropping pattern, growth in yields determines the growth in crop output. This is the assumption underlying the stated growth in the production of cereals as given in Table 6.

Procurement is also exogenous in the framework. Ratios of domestic procurement to domestic production of wheat and rice are held constant at September 1981 levels. The procurement operation matters in the flow of the framework only to the extent that it affects the fiscal food subsidy budget.

The Food Subsidy Budget and Assumptions about the Overall Fiscal Deficit

The total food subsidy budget equals the aggregate of explicit subsidies accrued per capita by rural and urban households--as represented by the sample survey--multiplied by the respective population figures, rural and urban. The overall food subsidy budget is also expressed in relative terms as a share of total government expenditures. Projections of total expenditures have been made for this purpose. In addition, it is a task of the framework to assess potential effects of food subsidies on the overall fiscal deficit from which implications for the change in the inflation rate will be derived.

The related projections of the overall budget situation during the period of analysis are based on the following assumptions:

³⁵ See von Braun and de Haen, Effects of Food Price and Subsidy Policies on Egyptian Agriculture.

Table 6--Assumptions about Domestic Food Production

Commodity	Output in 1981	Assumed Growth in Output or Yields 1981-1986 ^a
	(thousand tons)	(percent a year)
Wheat	1.938	0.0 ^b
Rice (milled)	1.409	1.6
Maize	3.307	1.8
Sorghum	653	0.0
Beans	207	0.0
Lentils	5	0.0
Sugar	658	3.0 ^c
Vegetable Oil	146	5.0
Meat (Red)	342	2.0
Poultry	140	4.6
Milk	1.902	1.1

^a If not otherwise mentioned, these growth rates equal those of the period 1975-76 through 1980-81.

^b Growth rates with the minus sign were actually negative during the period 1975-76 through 1980-81. They were set to zero on the assumption that improvements would be made in production management.

^c Growth in sugar production was set at this rate on the assumption that increased beet production for the new plant in the Nile Delta would make the difference.

Source: Data from Ministry of Agriculture, Cairo, and U.S. Attache Report, Egypt, Annual Agricultural Situation Report, 1983, pp. 51-53.

o Government expenditures net of food subsidies grow corresponding to GNP, with the respective elasticity observed during the period 1969-71 through 1979-81. This elasticity was estimated to be 1.319.³⁶

o Similarly, government revenues rise with GNP growth. The respective elasticity was estimated to be 1.234 during the preceding decade.

o The total fiscal deficit is simply the difference between government revenues and expenditures (net of food subsidies) as projected above, given a scenario-specific assumption of growth in income and the scenario-specific food subsidy budget. For the base year 1981-82, the following figures were used:³⁷

³⁶ This means that if GNP grows at 1 percent, government expenditure grows at 1.319 percent a year.

³⁷ The data are from data on fiscal operations as stated in Sadiq Ahmed, Public Finance in Egypt: Its Structure and Trends, Staff Working Paper no. 639 (Washington, D.C.: World Bank, 1984): 12.

Million Egyptian pounds

GNP	21,000.0
Government revenues	8,230.6
Government expenditure net of food subsidies	11,413.9
Food subsidies	1,473.1
Deficit	4,656.4

Accounting for Effects on the Exchange Rate

Manipulation of the exchange rate is a well-established instrument of price policy in Egypt.³⁸ Although the official exchange rate for basic food imports is fixed for extended periods, these imports have profound effects on the foreign-exchange requirements, as well as on the related effects of food subsidies on the money supply and the exchange rate on the open, or black, market. The open-market exchange rate is an important cost parameter for import-dependent businesses in Egypt, and it may also be roughly understood as an indicator toward which the official exchange rate tends to be adjusted in the long run. A reduced-form elasticity arrived at by Scobie's more elaborate modeling yields an elasticity of 0.33 for the black-market exchange rate with respect to food subsidies.³⁹ This elasticity is applied to the scenario analysis within the framework. The related results of the scenario analysis should be interpreted with caution, however, since the application of the elasticity to those scenarios that imply significant changes in the overall subsidy policy might go beyond the robustness of the parameter estimates upon which it is based.

Effects of Food Subsidies on Inflation: Assumptions and Computations

Scobie evaluated the macroeconomic effects of food subsidies comprehensively how they may translate into increased fiscal deficit and thus into increased overall inflation (see Chapter 3).⁴⁰ His findings are used in the framework. Under the assumption that food subsidies add to the fiscal deficit, Scobie arrives at a reduced-form elasticity of the inflation rate with respect to food subsidies of 0.53.⁴¹ This means that an increase of 10 percent in food subsidies would increase the inflation rate by about 5 percent--say, from 20 to 21 percent. The elasticity mentioned above is applied to derive the inflationary effects of the changes in the food subsidy budget as they occur under the assumptions of the alternative policy options evaluated.

Description of the Scenarios

The current experiment illustrates the framework with a baseline scenario and six additional scenarios, although the model is flexible and can evaluate a number

38 Scobie, Food Subsidies in Egypt.

39 Ibid., pp. 25-27.

40 Ibid.

41 It should be noted that this elasticity is, of course, strictly valid only for the relationships of macrovariables as they prevailed during the period of analysis and for the composition of the subsidy budget as of 1981.

of other variations if the need arises. Some of the basic features are presented in Table 7.

The baseline scenario (option 1) is an attempt to represent the actual situation in Egypt in 1981-82. The basis for the study comes from the consumption data in the 1981-82 household survey undertaken by IFPRI and the INP.⁴² The survey data have been expanded to the national level using rural and urban population figures. In general, survey consumption differed little from estimates of national consumption calculated from production and import (export) data.

Scenario 2 projects consumption and fiscal costs into 1986-87 under the assumption of constant *nominal* prices for subsidized food, which means that prices of subsidized food remain constant while other prices rise with the prevailing inflation. This assumption is an evaluation of the subsidy position during the second period in the absence of government actions to modify prices that prevailed at the time of the baseline survey. In effect, it operates under the axiom that not to decide is to have made a decision--in this instance, allowing subsidized prices to decline in real terms. Underlying this scenario, and the subsequent ones as well, is an assumption of growth in real income per capita of 4.5 percent a year and a growth in population of 2.5 percent--3.47 urban, 1.72 rural, net of migration; these are historic rates (see preceding section). The effects of reduced income growth will also be evaluated subsequently.

In this option, inflation of goods without price controls is assumed to be 15 percent a year. Consequently, prices of foods that are fixed in nominal terms, such as the prices of bread, decline in relation to the prices of other foods and of goods other than food. In addition, although the prices of rationed goods are seldom the marginal prices that determine allocations from the consumer's budget, the value of the transfer embodied in the quota increases when the nominal price remains constant during a period of inflation.

The third scenario is an investigation of the case of constant *real* prices of foods. Underlying this no-price-change scenario is an assumption that the government will take measures to change the prices of wheat flour, breads, and rationed goods, and the prices charged at cooperatives at a rate that is in keeping with the inflation rate of the prices of other goods.

The fourth scenario represents a number of important price changes. It is an investigation of a situation in which prices of the second-tier rationed goods are raised to import parity levels, as are the prices of cooperative goods, including frozen commodities. The price of the basic, or first-tier, ration is assumed to remain constant in *real* terms. The prices of wheat flour and bread are assumed to rise 50 percent from the baseline, also in real terms. This is somewhat less than is necessary if they are to reach import parity but can be indicative of the direction the economy will move following significant price movements. Open-market prices of staples also move to import parity, which involves *decreases* in some prices--for example, the price of sugar in Upper Egypt and the price of rice in a few delta regions. The prices of meat and dairy products are assumed to remain constant in real terms.

In the model a variation of scenario 4 in which wages for public-sector employees are raised in partial compensation for the reduced subsidies is also explored. In this option, referred to as scenario 4a, urban workers who belong to consumer cooperatives in the workplace--in public-sector enterprises as well as in the largest private factories--receive an additional LE 12.5 a month (1982 value). This is approximately LE 30 per family member, which was the average of the implicit value of subsidies in the urban area in the base year.

⁴² See Alderman and von Braun, Effects of the Egyptian Food Ration and Subsidy System.

Table 7—Main Features of Scenarios

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 4a	Scenario 5	Scenario 6
Changes in Relation to Baseline	Constant Nominal Prices for Subsidized Food Commodities	Subsidized Constant Real Prices for Subsidized Food Commodities	Food Prices to International Level: Bread and Flour (50%)	As Scenario 4 plus Wage Increase in Public Sector	Targeting of Subsidies	Change in Structure of Subsidies
			(percent)			
Population growth rate	2.5 annual	2.5 annual	2.5 annual	2.5 annual	2.5 annual	2.5 annual
Real income growth rate (per capita)	4.5 annual	4.5 annual	4.5 annual	4.5 annual plus wage increase of 12.5 LE/mo. in public sector	4.5 annual	4.5 annual
Real change of fino flour and bread prices	-50	0	+50	+50	+50	-14 urban -22 rural
Real change of balady flour and bread prices	-50	0	+50	+50	+50 general population 0 urban poor neighborhoods	-18 urban 0 rural
Change of first tier (basic) ration prices	-50	0	0	0	To border price general population No change poorest 25 percent	-50
Change of second tier ration prices	-50	0	To border price	To border price	To border price general population No change poorest 25 percent	-50
Change of cooperative prices	-50	0	To border price	To border price	To border price general population	-50 ^a
Change in open market prices	0	0	To border price (including pasta)	To border price (including pasta)	To border price (including pasta)	0

^a Prices of frozen meat and frozen chicken decline 42 percent in real terms.

In the fifth scenario, one of many possible targeting schemes is considered. The price environment for the general population is similar to that in scenario 4, except that the basic ration is discontinued for all but the poorest 25 percent of the population. These families, both urban and rural, receive the additional ration as well. Furthermore, it is assumed that they receive a coarse flour ration of two kilo per capita a month in the urban areas and six kilos in the rural area. Because the subsidy on flour bought on the open market is reduced in this scenario, this ration serves much as an income transfer equivalent to the value of the flour.

Bread, however, is not rationed in this scenario. It is assumed to be available without quota. However, only in the poorest 20 percent of the urban neighborhoods is bread available at the baseline price. The targeting of subsidized bread, then, is geographical, and average income in the census tract determines the target. While there is a great deal of administrative difficulty in applying a household level target as modeled for the ration system, neighborhood-level data are probably available from CAPMAS surveys. Educational data may also be available from the previous census. The average level of education reached by heads of households explained about 50 percent of the variation in average income of urban census tracts and would be most effective if augmented with other data, perhaps pertaining to the use of electricity or telephones.

The sixth scenario includes the changes in subsidy policies implemented between June 1982 and December 1984. Most notable are the changes in flour prices and bread prices, including changes in loaf sizes and extraction rates, announced in 1984. The price changes shown in Table 7 indicate the weighted effect of these various changes after the inflation rate for the general economy has been taken into account. Note that although these price changes were appreciable, the nominal change in the price of flour more or less parallels the assumed inflation rate and the change in the price of bread is slightly less than that rate. Consequently, the real price of flour and bread combined declines somewhat, although less than in the second scenario. The price of frozen goods also increased above what is in that scenario.

Implications of Alternative Food Subsidy Policies

Effects on the Subsidy Budget

The alternative scenarios specified for the consumer food price policy in the 1980s produce subsidy budgets between about LE 0.9 billion (scenario 5) and LE 1.9 billion (scenario 2) by 1986-87, measured in constant 1981 Egyptian pounds. Only in scenario 4, 4a, and 5 would the subsidy budget be reduced below the 1981-82 level. The change in the subsidy budget reported is in real terms (see Table 8). For comparison, some estimates of the nominal food subsidy budget are also included in Table 8.

The composition and structure of the subsidy budget differ among the various scenarios. It is evident that significant fiscal savings can be achieved only if substantial changes in the real prices of flour and bread, as well as changes in the prices of the subsidized frozen meat commodities sold from the cooperatives, were introduced. For example, although scenario 6--which is similar to some currently discussed policy changes--includes sizable price adjustments of a great number of commodities, it produces only a fiscal saving of 10 percent. The wage compensation for public-sector employees considered in scenario 4a would cost the government about LE 250 million in 1981 prices, or about LE 470 million in current prices.

Table 8—Scenario Analyses for Food Subsidy Policies: Fiscal and Macro Effects

	Baseline (1981-82)	Constant <u>Nominal</u> Prices for Subsidi- zied Food Commodities	Constant <u>Real</u> Prices for Subsidized Food Commodities 1986-87	Subsidized Food Prices to International Level: Bread and Flour (50%)	As Scenario 4, plus Wage In- crease in Public Sector	Targeting of Subsidies	Change in Structure of Sub- sidies (for details see Table 3)
Food subsidy budget				(1986-87)			
Real (constant) LE	1,299 ^d	1,871	1,573	969	1,226 ^f	936	1,675
Nominal LE	1,299 ^d	4,372 ^e	3,405 ^e	1,7855	2,258 ^e	1,724	3,720 ^e
Food subsidy budget in percent of projected:							
Total budget	10.1	12.2	10.6	6.8	7.5	5.8	11.2
Fiscal deficit	27.9	32.5	28.9	20.0	21.8	17.6	30.2
Foreign exchange for basic food imports ^a (Million US dollars)	2,525	4,009	3,756	3,552	3,573	3,572	3,820
Change in overall inflation rate because of food subsidies ^b	-	+3.5	+1.7	-2.0	-0.4	-2.2	+2.3
Exchange Rate on the open market (Index) ^c	1.00	1.15	1.07	.92	.98	.90	1.10

^a This includes basic food items (as mentioned in the previous section) handled by the government. The U.S. dollar is valued at the official exchange rate (US\$1 = LE 0.84).

^b Assumed base level of inflation is 15 percent; the number 3.5 for scenario 2 thus means that inflation would increase from 15 percent to 18.5 percent.

^c The index shows the value of the U.S. dollar in terms of Egyptian pounds, for example, if LE 1 = US\$1 in 1981-82 on the open market, it was LE 1.15 for US\$1, according to scenario 2 in 1986-87.

^d The officially reported food subsidy budget for 1981-82 is LE 1,473.1 million (Ministry of Finance). The deviation from the computed figure here may be the result of some underestimation of operating costs of the system.

^e The nominal food subsidy budget (at current prices) is computed with an assumed basic inflation rate of 15 percent a year, plus the scenario-specific change in the rate of inflation. This gives, for example, for scenario 2, an inflator of 18.5 percent a year.

With the projected fiscal operation of the government in scenarios 2 and 6, the expenditures for food subsidies would require a larger share of the total budget by 1986-87 than they required in 1981-82. The share might rise from about 10 percent to 12 percent (see Table 8). With scenario 3--constant real prices--the subsidy budget would roughly maintain its 10 percent share while scenarios 4, 4a, and, most significant, scenario 5 would reduce the position of food subsidies in the government budget.

Effects on the Deficit and Inflation

In all the scenarios food subsidies would correspond to a large share of the total deficit. In scenarios 2, 3, and 6, the ratio would be around 30 percent. It should be stressed that food subsidies as a total fiscal figure are not the sole cause of the deficit. However, at the margin, they may induce a large proportion of the fluctuations in the deficit.⁴³ Under the assumption that changes in food subsidy expenses translate into changes in the deficit, the implicit monetary effects of the subsidy policy on inflation are derived for the scenarios in which the results of Scobie's model are used. Under the assumption of an inflation floor level of 15 percent a year, the conditions of scenario 2 might induce an increase of 3.5 percent in the rate of inflation (see Table 8). Under scenarios 4, 4a, and 5, the initial level of inflation would be reduced.

Effects on Foreign Exchange

The alternative subsidy policies have quite distinct effects on the requirements of foreign exchange for imports of food and the exchange rate. In all the scenarios, even the quite drastic scenario 4--the foreign exchange required for imports of food in 1986-87 would be substantially higher than that required in 1981-82. Under realistic assumptions of growth in supply from domestic food production, it seems that Egypt will continue to become more import-dependent on the international food markets--at least in the absolute terms of the food-import bill--even if food price subsidies were cut drastically.

The exchange rate is affected by this increased demand for foreign exchange. It is affected even more by the implicit effects of the fiscal deficit from food subsidies, which impact on the balance of payments, the stock of net foreign assets, and the money supply.⁴⁴ Under the conditions of the no-action scenario (scenario 2), the open-market exchange rate might increase from 1.00 to 1.15 between 1981-82 and 1986-87. Scenario 3, on the other hand, might cause half of such a devaluation effect for the Egyptian pound (see Table 8, last line). With scenarios 4 and 5, the value of the Egyptian pound in relation to the constant U.S. dollar might increase by 8 and 10 percent, respectively. The difference between scenarios 2, on the one hand, and scenarios 4 and 5, on the other, in the index of the open-market exchange rate is quite substantial. As a result of a continuously delayed adjustment of the official exchange rate to the actual value of the currency on the open market, typical distortions in the economy may be an overvaluation of nontradables and undervaluation of domestically produced tradables. This may lead to inefficient taxation of the tradables sectors and distortions in prices between sectors.

The numerical results presented may not, of course, be interpreted as predictions of the exchange rate on the open market. Rather, they should hint at

⁴³ See Scobie, Food Subsidies in Egypt.

⁴⁴ *Ibid.*, pp. 18-22.

the magnitude and the directions that the partial effects of subsidy policies might imply for the exchange rate.

Effects on National Food Consumption and Imports

Food consumption in Egypt will continue to expand rapidly during the 1980s given the assured rates of income growth and population. During the period 1981-82 to 1986-87, total consumption of important food commodities would show the following changes on food price subsidies under the no-action scenario 2:

Sugar	+20 percent
Cooking Oil	+16 percent
Beans, Lentils	+2 percent
Rice	+7 percent
Wheat	+36 percent
Meat, Chicken	+28 percent

The most dramatic expansions in consumption would occur for wheat and animal products (see Table 9). The effects of the policy changes specified for the other scenarios (Nos. 3, 4, 5, and 6) on national consumption are quite interesting when compared with the no-action scenario 2.

The estimated own-price and cross-price elasticities determine the results under the respective assumptions concerning food price policy. In the following, the differences between the scenarios as computed for 1986-87 are expressed in percents taking scenario 2 as a base:

	<u>Differences in total consumption between scenarios relative to scenario 2 (percent)</u>			
	(3)	(4)	(5)	(6)
Sugar	-1.6	-2.6	-2.2	-0.2
Cooking oil	-0.9	-3.0	-2.6	-
Beans and lentils	+9.0	+28.4	+30.3	-0.4
Rice	+11.4	+34.7	+34.3	-0.3
Wheat	-11.8	-25.4	-25.7	-9.0
Meat, Chicken	-3.2	-5.2	-5.0	-0.7

While consumption of sugar and cooking oil is only a little responsive to the alternative policy changes, this is certainly not true of cereals and pulses. With policy options (4) and (5) versus (2), consumption of wheat would be curtailed by about a quarter. However, strong substitution effects would push up consumption of rice and pulses in this instance. Thus, the overall consumption effects for total grains would be much less than it appears at first glance on the wheat market alone; in comparison to scenario 2, total consumption of grain would be reduced 5.2 percent in the case of scenario 3 and 10.9 percent and 5.5 percent in the cases of scenarios 4 and 6, respectively.⁴⁵

The substitution effects between grains have strong ramifications for food trade patterns (see Table 9). The case of rice is particularly striking. While under some optimistic production projections the rice industry may still produce a small exportable surplus in 1986-87 under the conditions of "no-action" scenario 2, this could not be the case under the conditions of options 3 and 4. These scenarios include substantial cuts in the wheat subsidy to consumers. Under

⁴⁵ This includes wheat, rice, maize, pulses (beans and lentils) in grain equivalents.

Table 9—Scenario Analyses of Food Subsidy Policies: Effects on Food Consumption at the National Level and Trade Scenarios

	Baseline (1981-82)	Actual (1981) (1)	Constant Nominal Prices for Subsi- dized Food Commodities (2)	Constant Real Prices for Subsidized Food Commodities 1986/87 (3)	Subsidized Food Prices to International Level: Bread and Flour (50%) (4)	Targeting of Food Subsidies (5)	Change in Structure of Subsidies ^a (6)
				(1986-87)			
<u>National Consumption</u>							
Sugar	1,078	(1,413)	1,290	1,269	1,257	1,261	1,288
Oil	460	(459)	534	529	518	520	534
Rice	1,391	(1,473)	1,485	1,654	2,001	1,995	1,480
Beans	349	(300)	330	378	429	430	329
Lentils	132	(87)	159	155	199	201	158
Wheat (total) ^b	8,123	(7,816)	11,078	9,770	8,268	8,344	10,077
Wheat flour (72%) ^c	1,462	n.a.	2,067	1,876	1,602	1,596	2,079
Maize	4,582	(2,615) ^d	4,753	4,803	4,633	4,635	4,744
Chicken	711	(217)	890	856	843	844	883
Fish	313	n.a.	391	386	383	383	389
Meat	518	(466)	683	667	648	650	679
<u>Imports</u>							
Sugar	313	(583) ^e	526	504	492	497	523
Oil	275	(313)	349	343	332	335	348
Rice	-131	(-25)	-37	132	479	474	-42
Beans	142	(92)	123	171	222	224	122
Lentils	127	(82)	154	150	194	196	153
Wheat (total) ^b	6,185	(5,878)	9,140	7,832	6,330	6,406	8,139
Wheat flour (72%) ^c	1,462	(1,388)	2,067	1,876	1,602	1,596	2,079
Maize	977	(1,383)	1,149	1,198	1,029	1,030	1,139
Chicken	41	(84)	220	186	173	174	213
Meat	138	(123)	304	288	268	271	299

^a For details, see Table 3.

^b Wheat (total) is all consumption of wheat and wheat products in wheat grain equivalents.

^c Wheat flour (72%) is consumption of wheat flour—for example, 72 percent extraction rate, including shami and afrangi bread) and pasta in wheat grain equivalents.

scenario 4--the world price option combined with 50 percent price increases for bread and flour--about a half-million tons of rice would be imported in 1986-87. Imports of bean and lentil would also increase significantly (see Table 9). The foreign-exchange costs of such a change in the import pattern must be carefully assessed in view of the fact that Egypt is a principal recipient of wheat food aid. Its preferential position as an accustomed recipient of external import price subsidies for wheat may not be fully transferable to imports of rice. If actual imports are less than that demanded in the scenarios, the price of rice on the open market would rise higher than the world price. The actual domestic open-market price is dependent on the level of excess demand; such levels reflect import quotas, which are not studied in the projections.

Effects on Industrial Output and Investment

Scobie's analyses of Egyptian import demand for food and other commodities have pointed out the potential destabilization effects for the industrial sector of fluctuating foreign-exchange demand for the subsidized food imports (see Chapter 3). This is because of the country's unresponsiveness to fluctuating food-import bills: the import expenditure elasticities for food are much lower than those for industrial imports. Thus, any decline in the availability of foreign exchange will disproportionately affect industrial imports and, through that, industrial output and investment.⁴⁶ Scobie's model yields an elasticity of industrial output with respect to foreign-exchange supply of 0.38 and an elasticity of industrial investment with respect to foreign exchange supply of 0.56. With these elasticities, on the one hand, and the relative differences of foreign exchange required under the scenarios, on the other hand, a rough estimate of the industrial output and investment effects of the alternative food price subsidy policies were derived. In comparison to the "no-action" scenario (No. 2), industrial output and investment would be greater under all the other options.

The most extreme difference, of course, is that between scenario 4 (world prices) and scenario 2. An estimated 1.8 percent of additional industrial output might be attributed to equivalent foreign exchange savings achieved under policy option 4 over option 2. The other options--3 (real constant subsidized food prices), 5 (targeting in combination with increased prices), and 6 (change in the structure of subsidized food prices)--might result in increments of 1.0, 1.5, and 0.7 percent, respectively, in industrial output. These numerical results cannot, of course, be more than very rough estimates based on the specific assumptions as stated by Scobie.⁴⁷ The economic growth, investment, and employment effects of food subsidies certainly require further research.

Income Distribution Effects

Since scenario 1 is the baseline, the indicators in Table 10 report the situation at the time of the survey. Since these details were discussed earlier, in Chapter 5, little discussion seems necessary here. It is important to note, however, that the definition of urban and rural poor used in this section differ slightly from those in Chapter 5, although the definition remains the same in all scenarios. In this analysis, the urban poor are defined as those families that spent less than LE 250 (1982 value) per capita in 1987. In the rural area, LE 150

⁴⁶ Scobie, Food Subsidies in Egypt, pp. 44-46.

⁴⁷ Scobie, Food Subsidies in Egypt.

Table 10—Some Indicators of Distribution in Alternative Scenarios

Item	Baseline	Constant <u>Nominal</u> Prices for Subsi- dized Food Commodities	Constant <u>Real</u> Prices for Subsidized Food Commodities 1986-87	Subsidized Food Prices to International Level: Bread and Flour (50%)	As Scenario 4 plus Wage In- crease in Public Sector	Targeting of Subsidies	Change in Structure of Subsidies ^a
	(1981-82)		(1986-87)				
Annual per capita transfer from government to consumers (Egyptian pounds)	27.18	35.05	28.65	15.88	21.30 ^b	15.20	30.95
Transfer to urban poor	27.54	33.05	28.93	15.34	22.12 ^b	27.41	30.65
Transfer to rural poor	19.57	25.16	22.43	13.05	13.05	28.95	20.44
Transfer as percentage of expenditure of urban poor	19.0	18.24	16.0	8.5	11.8	15.1	16.9
Transfer as percentage of expenditure of rural poor	22.0	22.8	20.2	11.8	11.8	26.1	18.4
Daily calorie intake of urban poor	2,270	2,466	2,356	2,244	2,268	2,313	2,430
Daily calorie intake of rural poor	2,028	2,587	2,256	1,956	1,956	2,095	2,288
Index of calorie-deficient population (urban poor)	100	68	88	100	96	91	75
Index of calorie-deficient population (rural poor)	100	62	79	104	104	88	73

^a For details, see Chapter 3.

^b A pay raise is counted as a transfer.

was the cut-off point. This represents 15.2 percent and 14.0 percent of the populations, respectively.⁴⁸

There are significant differences among the different scenarios, both in the amount of average purchasing power transferred to families and in the distribution between groups.⁴⁹

Even in scenario 3, which represents a position in which relative prices do not change, there is an increase in per capita subsidies in addition to the increase in total outlays for subsidies because of population growth. This is because income growth leads to increased purchases of flour, bread, and *pasta*. Unlike purchases from the ration shop or the cooperative--quotas for which are constant in the model--the increased purchase of these flour products leads to increases in subsidies per capita. Transfers decline as percentages of income, however, as wages and profits grow under the assumptions in the model.

The per capita growth in transfers in scenario 3 is 1 percent a year, while it is 5.2 percent under scenario 2. As discussed earlier, scenario 2 represents a position of inertia in subsidy policies and is an extreme position concerning both costs and benefits. In this scenario, nominal prices are constant in the cooperatives and ration shops; hence the gap between them and the opportunity cost increases as open market prices rise. Note that this gap generally increases at a faster rate than overall prices rise.⁵⁰ Another source of increased subsidy is the declining relative price of wheat, which leads to substitution toward that commodity and an increase in the real income of the population, some of which lead to more purchases of non-subsidized food as well.

Scenario 6 contains some elements of scenario 2--fixed nominal prices in the ration shops, and some elements of scenario 3--changes in the marginal price of bread and flour which keep real prices more or less constant. Accordingly, the average transfer to the consumer lies between those of scenarios 2 and 3. In this scenario, the growth rate of transfers is 2.6 percent. This is less than the income growth and therefore means that transfers would become a smaller share of total expenditure than in the base year.

Since important components of the subsidy program are eliminated in scenario 4, it is not surprising that total transfers decline appreciably. Given income growth, the share of transfer to total expenditure is approximately half its earlier position.

When the compensating wage increases in scenario 4a are considered as transfers, the decline in total transfers is less steep. Nevertheless, because it affects only about a third of the urban population and none of the rural, average transfers in scenario 4 are much lower than the baseline.

⁴⁸ These cut-off points were based on a technical criterion, not welfare. Parameters were originally estimated for the poorest 25 percent of the two populations. However, with income growth, a portion of the group move into a category for which other parameters had been estimated. Since our purpose is to investigate relative positions of different policies rather than to determine a category of absolute poverty, it is most useful to define poverty consistent with the previously estimated parameters.

⁴⁹ These transfers are calculated as the direct gains to consumers and differ from government expenditures, which include margins to millers, bakers, and grocers and which also net out implicit revenues from procurement quotas.

⁵⁰ The smaller the percentage of subsidy to total cost in the base year, the greater the proportional increase in subsidy in this scenario.

In scenario 5 the total transfers to consumers are less than in the other experiments. This reflects the decrease in the costs of the basic ration, which is eliminated for three-fourths of the population.

The distribution of the transfers among urban and rural groups and among income classes changes somewhat in the course of the scenarios. While the per capita transfer to the rural sector was equal to 74 percent of that to the urban sector in the base year, it rises to 81 percent in the second and third scenarios and to 92 percent in scenario 4. In scenarios 2 and 3, this is attributable to the greater responsiveness of prices and incomes in rural areas. In scenario 4, the changes in the cooperative and second-tier ration system eliminate subsidies which were originally skewed to the urban community. In scenario 5, the rural transfer actually exceeds the urban transfer because of the value of the wheat flour ration. However, as will subsequently be indicated, this is partially offset by higher prices in the rural areas. While scenario 6 shows average transfers midway between the second and third scenario, the share of transfers to the rural sector is similar to that in the first scenario. This is the result of the greater increase in rural flour prices, which is not offset by other changes, as it is in the fourth scenario.

Since the wage policy assumed in scenario 4a is a benefit only to the urban population, it is not surprising that 4a presents a decline in the relative position of rural transfers. They are only 56 percent of urban transfers in this scenario.

In each instance in which the average transfer increases, the absolute gap between that average and the value of the transfer to the poor increases. Similarly, the gap decreases in scenarios 4 and 5 when the total value decreases. Relative shares, however, follow a less consistent pattern. The relative share of transfers to the rural poor rises in the second, third, and fourth scenarios mainly for the same reasons that the gap is closed for the rural sector as a whole. For example, the slight increase in the per capita transfer to the rural poor in relation to the national average in scenario 3 is attributable principally to the higher income elasticities for food commodities estimated for this group. In scenario 6, the position of the rural poor deteriorates in relation to that of the rest of the rural sector. Similarly, for every pound received per capita by the general population in the sixth scenario, the rural poor receive only 66 piasters. In 1981 the corresponding figure was 72 piasters. As the transfers to the rural poor in scenario 4a are the same as in scenario 4, their position in relation to that of the general population has deteriorated. In scenario 5, of course, they are the principal beneficiaries, receiving nearly twice the amount of the transfer received by the general population. Note that in this targeting scenario, there is still an appreciable transfer to the rest of the population. The population defined as nonpoor in Table 10 includes households in the target population. Furthermore, some subsidy on flour and bread remains. The average transfer to the nonpoor is LE 12 in scenario 5.

While the urban poor received a greater transfer than average in scenarios 1 and 3--but not more than the urban middle class--in the other scenarios the transfers to these families are less than the mean transfer to the total population. The decline in relative position is most apparent in the second scenario, in which the growth of transfers to the general population and to the rural poor exceeded the growth in income. In this scenario, the growth in subsidies to the urban poor, while appreciable, was less than the mean growth, accounting for the decline in the share of transfer as a percent of total expenditures.

The urban poor, like the rural poor, are the principal targets of the subsidy program. They do not, however, gain in relation to the total population, and this situation declines in relation to that of the urban middle class when wage compensation is considered. This indicates that despite a decline since 1973 in wages in the public sector in relation to those in the private sector, the public

sector is not disproportionately represented in the poorest 15 percent of the urban population.

Effects on Nutrition

Although in all scenarios income growth net of changes in subsidy-related income transfers is positive, there are large differences in the total and average calorie intakes by the poor and the general population. The effect of income growth alone is indicated by the intakes in scenario 3. The rural poor increase their intakes by more than 200 calories and the urban poor have an average increase of 80 calories per person a day. The increase is greater in the rural area because of higher income elasticities for most commodities in that sector. In addition, most commodity elasticities decline with income, and incomes are lower in the rural areas.

Although transfers to the rural poor in the sixth scenario are less than they are in scenario 3, the lower relative price of *fino* flour encourages substitution, which offsets the reduced effect of income on calorie intake. Consequently, there is a slightly greater increase of calories for this group than in scenario 3. For the urban poor, the income and substitution effects reinforce each other and there is a sizable calorie intake in relation to both the base position and the no-real-price-change position. Recall that even with the reported increases in the nominal prices of flour, real prices of bread and flour decline in this scenario and at a greater rate in urban areas.

The experiment in scenario 2 shows an even greater decline in the relative prices of wheat products and larger increases in the value of the transfer embodied in the ration. Consequently, the increase in calorie intake in this scenario is quite high, although it reflects the current consumption effects of increased transfers from the government, which come at the expense of future generations. In this scenario, average intakes of the rural poor exceed those of their urban counterparts and reflect their greater price responsiveness. The index of underconsumption for the poor declines in both sectors. While more than 40 percent of the group defined as poor were classified as calorie-deficient in the base year, this declines to approximately 25 percent in 1987.

Another way of illustrating this point is to note that with the population growth and the definition of the category of the poor used in this scenario, the 6 million poor Egyptians in 1981-82 have increased the sizes of their families so that they number more than 7 million in 1987. Nevertheless, while 2.5 million of these poor were from families in which the average daily intake of calories was less than 85 percent of requirements in the base year, less than 1.8 million were categorized as such under scenario 2.

A different nutritional picture is presented in the fourth and fifth scenarios. In these cases, the increase in relative prices of foods leads to substitution of other goods. This effect is sufficiently large in scenario 4 to offset the increase in calories caused by changes in income, and average calorie intakes decline for both the urban and the rural poor, despite sizable income growth. This decline is greater in the rural sector, where calorie intakes were already lower than those of the urban poor. While the index of underconsumption indicates only a small increase in the number of families within the category of urban and rural poor, the families now classified as not meeting 85 percent of calorie requirements include 2.9 million people. Furthermore, some families not defined as poor in the base case, using the income cut-off point, are also predicted to suffer decreases in calorie consumption and hence may also be at increased risk of undernutrition. This situation is not appreciably altered in the wage increase variant of scenario 4, although there is a slight decline in urban underconsumption.

In scenario 5, the setting of targets leads to urban transfers equivalent to those in the base year, and rural transfers to the poor are greater than in the base year. Nevertheless, there is not an appreciable increase in calorie consumption in relation to the baseline or a decline in relation to scenario 3. This reflects the increase in the marginal prices of subsidized foods, except *balady* bread in poor urban neighborhoods. Rural incomes, in particular, are redirected to other foods and to other products than foods. Note, however, that the index of undernutrition does decline in this scenario in relation to the baseline scenario. Moreover, it is much lower than that of scenario 4 or 4a, although the total cost of subsidies is less.

Effect of Changes in the Impact of Subsidy Policies When Income Growth Slows Down

In the preceding sections various policy options were explored under the assumption that real growth in income per capita was 4.5 percent a year. While this represents the trend level in the years preceding the baseline year, it may be optimistic for a period with declining oil prices and slow growth in Suez Canal traffic and in tourism. Accordingly, scenarios 4 and 6 were also run with an assumption that the real growth in income per capita slowed to 2 percent a year.

This variation in the income assumption affects the aggregate figures only slightly. Because growth in income has only a small impact on the subsidy bill, for example, the average transfer per capita declines from 30.95 in the high-income growth version of scenario 6 to 30.67 in the low-income variation. Similarly, the government outlay for subsidies is only 1.1 percent lower in the low-growth variation. With lower national income, however, the share of subsidies to total budget is 11.7 percent, whereas it is shown as 11.2 percent in Table 8.

Moderate income elasticities, on the average, also account for only small differences in total consumption or imports under the low-growth scenarios. For most macro indicators, then, there is little implication for changes in income growth rates. A minor exception to this statement may be found with rice exports, which more than double, from 41,000 tons with high-income growth in scenario 6 to 94,000 tons in the low-income alternative. Even this higher figure, however, is only a small portion of total production.

The main implication of low growth concerns nutrition. The index of underconsumption in the low-growth version of scenario 6 is 80 for the urban population and 87 for the rural population.⁵¹ Note that with a population growth rate of 2.5 percent, a reduction of 13 percent in the percentage of families to whom inadequate calories are available, which is indicated for the rural poor, implies that the total *number* of individuals at risk of malnutrition remains virtually unchanged in the two periods.

Looking at the indexes of malnutrition in the low-growth alternative of scenario 4, there is a particularly striking difference from the high-income scenario. In the high-growth version, the favorable effects of high-income growth managed to counterbalance the reduction in calorie intake that would follow an increase in food prices, so the percentage of families that consumed less than 85 percent of the calories they required remained roughly constant. In the low-growth scenario, however, the index of underconsumption has risen appreciably to

⁵¹ Given slower growth rates, more families live below the poverty cut-off point in this alternative--20 percent of the urban population and 19 percent of the rural population, respectively. However, the index is based on the currently defined poverty group as stated above. The index, then, measures effects of subsidy options rather than modifications in the classification of the poor.

116 on the rural sector and 111 in the urban sector. Given the growth in population, this implies an increase of more than 28 percent over the number of families at risk in 1981-82. This is the clearest example of a possible trade-off between economic health and the health of the poor. If planners feel that aggregate income growth--or only income growth of the poor--will be closer to the low rate, then the need to explore the other policy options presented or combinations of them, including targeting of food subsidies toward the poor, is most apparent.

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