C/76-1

MIT INTERNATIONAL NUTRITION PLANNING PROGRAM

Discussion
Papers No. 6

Subsidized Food Consumption Systems in Low-Income Countries: The Pakistan Experience

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April 1976

TABLE OF CONTENTS

PREFACE

Our interest in subsidized consumption systems and in the Pakistan case in particular, stems in part from the INP Program's involvement during the past few years in nutrition planning in Pakistan. It was the Government of Pakistan which coined the term consumption planning, and Namet Ilahi and his colleagues in the Planning Commission have been examining the operational implications of such planning.

On a more general level, as nutrition planners and advocates we have been interested in examining the nutritional implications of programs implemented for other purposes. In most low income countries it is difficult to obtain large appropriations for nutrition and other welfare programs which are by definition geared to the poor. Therefore, we believe it is important for nutrition advocates to monitor the effects on nutrition of programs and policies in a broad range of development sectors, and to use their influence to modify those programs in nutritionally beneficial ways.

While it is unlikely that many countries would undertake subsidized consumption systems purely for the purpose of aiding the poor, there has been increasing interest of late in the question of utilizing such systems for nutrition and income redistributional purposes where they are already operating. There is also discussion among food aid donors of the possibility of tying at least a portion of concessional sales to distribution through a subsidized consumption system to assure benefits to the poor. This positive interest in subsidized consumption

is at odds with the traditionally bad name given to food rationing and food subsidies. According to the conventional wisdom, these mechanisms have exorbitantly high administrative opportunity costs, represent a major budgetary drain, result in a misallocation of resources, and should be employed only as short-term measures during periods of severe food scarcity. Accordingly, international banks and development organizations often encourage low income governments to eliminate or significantly reduce these systems. Ironically, these same organizations often carry out explicit programs designed to affect nutrition and income distribution which would probably be considered highly successful it they produced results comparable to those reported in this paper.

There is remarkably little literature on subsidized consumption systems from any perspective. The explanation for this absence of study may be largely a matter of bailiwick. The agronomist has been concerned traditionally with agricultural production, the agricultural economist with production economics and with the distribution system up to the market place, and the nutritionist, generally, with distribution between the front door and the stomach. The one group which has been involved in this part of the distribution system are those concerned with private sector marketing, and their interest in public distribution systems has been minimal. As a result, the consumption end of the distribution system in low income countries has been largely ignored.

Although both of the authors have worked in Pakistan and are reasonably familiar with the country, the analysis for this paper was

carried out in Cambridge using Pakistani data collected for other purposes. Despite these limitations we have been able to begin addressing a number of the questions one would wish to ask of such systems: whether they work; who benefits; and how much they cost.

This study then, and others which we hope will follow, begin to examine the economic and political feasibility of subsidized consumption systems, their potential effectiveness in achieving nutritional and income distributional ends, the preconditions under which they might be effective, and the forms which would be most appropriate for particular sets of preconditions.

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Cambridge, Massachusetts
April 1976

INTRODUCTION

In almost all countries of the world, the production and distribution of food is regulated in some manner by the government. Government policies may restrict or promote imports or exports of food; they may grant implicit or explicit subsidies to the agricultural sector, or to industry at the expense of agriculture; or they may influence the wholesale or retail market for various commodities. All of these policies affect, directly or indirectly, the retail price of food sold within the country. In the wealthy nations of Europe and North America, agricultural policy is generally protectionist and operates to maintain food prices at a higher level than they would be in the absence of government intervention. Since incomes in these countries are high, and the proportion of income spent on food relatively low, the majority of their populations are able to maintain an adequate level of food consumption is spite of these prices.

In developing countries, incomes are low and malnutrition is widespread. Thus higher food prices are likely to have far more serious negative consequences for the consumer. At the same time, these countries experience a low level of agricultural productivity in terms of both labor and land, which results in food shortages at home and inadequate quantities of food for export. Policy makers in low-income countries are thus faced with conflicting objectives in influencing food prices: higher prices might encourage increased production but they will also

reduce food consumption among the portion of the population most vulnerable to malnutrition. One means of resolving this conflict has been to institute government subsidies on the consumer prices of selected foods. These subsidies take various forms, but they all provide a mechanism by which the government fills the gap between desirable producer prices and prices which allow an adequate diet to the low-income consumers.

This paper will describe in detail one such program: The ration shop system in Pakistan. We will attempt to estimate the extent of its benefits to consumers and its costs to the nation, and to show how particular aspects of the program contribute to its overall effectiveness. Critics of the concept of consumer food subsidies cite as problems the high cost of these programs and the extent to which benefits reach individuals not in the target group. The Pakistan ration shop system would seem to demonstrate that these problems may not be insurmountable. It also appears that the Pakistan approach to subsidized consumption has advantages which render it viable, while programs which may appear more advantageous in theoretical terms have worked less well in practice.

In this paper, we will first discuss some of the theoretical issues involved in the manipulation of food prices. We will then describe the origins and the present structure of the Pakistani ration shop system. Details of the ration program's operation can be found in the appendix to this report. Discussion following the

program description will focus on four major questions: 1) who benefits from the system? 2) what does it cost, and who bears the costs? 3) what would be the effect on costs and benefits of changes in the system? 4) how dependent is the system on international food aid? Finally, we will attempt to draw some conclusions regarding the Pakistani program and its implications for similar programs in other countries.

I. AGRICULTURAL PRICES AND THE ROLE OF FOOD SUBSIDIES

Historical Approaches to Agricultural Price Policy

Agricultural prices historically have been manipulated in low-income countries to serve the purposes of economic development rather than to increase levels of individual consumption per se. Early theories of development held that agricultural prices should be kept low relative to prices in the industrial sector, in order to promote investment in industry. This idea originated with Ricardo's belief that food was the key wage good, and therefore low food prices would keep wages low, enabling industry to take advantage of cheap labor. The relatively higher profitability of industrial products would provide the incentive for expansion of this sector and the profits would provide capital for reinvestment [1] Since wages are devoted almost exclusively to consumption, higher wages which result in reduced profits would lower the rate of investment and therefore slow the rate of economic growth. This policy of low agricultural prices was initially followed by a number of developing countries[2] in part because they were operating under the popular misconception that industrialization, if not synonymous with economic development, was the surest path to achieving it. This misconception was fostered by the various "stage" theories of growth, which identify "developed" with "industrialized" economies. In addition, the psychological association of reliance on agriculture with economic backwardness and exploitation discredited and discouraged serious concern with this sector in many national governments.[3]

The consequences of this policy were unfortunate. Farmers shifted from food crops to more profitable cash crops where this was possible, reducing the availability of food on the market. The agricultural sector in many countries stagnated, due to institutional constraints as well as to the absence of price incentives for agricultural investment.

By the end of the 1950's, experience had demonstrated that agriculture as well as industry was a vital component of economic growth[4]. Economists began to recognize that, in order to make the transfer of labor to the industrial sector possible, agricultural production would have to be maintained at least at the same level with fewer workers, which meant that the average productivity of labor in this sector would have to be improved.[5] In fact, an even higher level of production would be needed to avoid inflation as increasing productivity in the industrial sector led to higher wages and a higher level of demand for food.[6] Furthermore , it was realized that the agricultural sector in developing countries frequently employs the majority of the labor force, provides more than half the gross domestic product, and in many cases accounts for a substantial proportion of export earnings as well.[7,8] It was recognized that the agricultural sector is essential in providing a domestic market for manufactured goods, and must be the major source of savings for capital formation, and of foreign exchange for the purchase of industrial capital goods as well as imported consumer products. These functions

of the agricultural sector cannot be fulfilled unless agricultural production and income are increasing. In order to increase productivity, investment in agricultural inputs must be made at the same time that capital is being provided to the industrial sector, and an increase in domestic demand requires higher incomes in this sector, so that consumption as well as investment may increase. Based on such reasoning, many countries have shifted to a policy of maintaining high prices for agricultural products, in an attempt to encourage increased production.[9,10]

Effects of Prices on Producers

There has been considerable controversy in the literature as to whether farmers in subsistence economies respond to price incentives by increasing output and the quantity marketed, or whether they produce only for their own consumption and fixed economic needs, so that higher prices for their produce would result in a smaller quantity being put on the market.[11]

The balance of recent evidence indicates that except for those operating just at or below subsistence levels, farmers in developing countries do demonstrate price responsiveness both in terms of output and of quantity marketed.[12] The price elasticity of the marketed quantity is higher for cash crops than for subsistence crops,[13,14] tends to be higher for larger landholders,[15] and is of course subject to the constraint of weather,[16] but it is positive under most conditions. The idea that small farmers have no incentive to raise their level of living

by producing and marketing more has been found to be generally false.[17]

Mellor[18] has raised the question of whether price incentives are capable of raising aggregate agricultural production, or whether farmers simply shift the fixed quantity of their resources between crops based on changes in relative price. He argues that, in the face of static agricultural technology, only relative outputs are altered in response to price changes. This may be so, but it is characteristic of the agriculture of developing countries that there is considerable scope for the application of improved techniques of cultivation. The evidence is that farmers in developing countries usually behave in an economically "rational" way, by maximizing their output based on their present level of knowledge and technology.[19,20] Therefore, the expansion of agricultural outputs should result if two conditions are fulfilled: first, new techniques and education in their use must be available, and second, there must be an economic incentive to adopt these techniques and increase production. Several authors[21,22] have stressed that the objective of positive agricultural price policies is not only to encourage increased production by present methods, but to promote the adoption of new inputs and methods as well, and so prices must be maintained at levels high enough to cover the costs of these new techniques. The inference to be drawn is that expansion of aggregate agricultural production through price incentives may be possible under certain conditions, if the technology is available.

Several countries, including Pakistan, have attributed their success in raising levels of food production to their success in raising levels of food production to their policies of price support and stabilization.[23]

It has been argued that, in fact, positive price policies cannot be said to prevail in a country unless agricultural prices are free to rise to the level of the international market. Restrictions on exports are said to depress prices below their free market level, discouraging production and resulting in a misallocation of resources.[24] Since the international market represents the composite of many nations' interference with their own imports and exports, it is not obvious that its price levels are any less distorted from some hypothetical free market price than are prices in an individual country. Of course, it is true that, if the international price for a commodity is higher than the domestic price, farmers who sell their output at home are incurring an opportunity cost, and the nation which does not export is losing potential foreign exchange. Nonetheless, some governments may consider it worthwhile to prohibit exports in order to keep food supplies in the country which would otherwise be lost. Given the disparity in incomes between developed and developing nations, rich countries will probably always be able to bid more for foodstuffs than the population of poor countries can pay for their own consumption. Governments may also impose export taxes or maintain a monopoly on export trade in order to obtain scarce foreign exchange for investment in national development projects, rather than allow it to go into

private hands where it might be spent on high consumption levels or invested outside the country. The fact that so many countries restrict export trade in some way indicates that there is a strong felt need for such interventions. Clearly also, there is no inherent relationship between these trade restrictions and the concept of subsidized food consumption although the latter has been frequently criticized on the basis of its association with the former.

Effects of Prices on Consumers

The primary objective of maintaining high agricultural prices is to stimulate production. One of the principal reasons for increasing production is to ensure adequate food supplies to the population, but it may be that these very prices adversely affect food consumption, especially among low income groups most vulnerable to malnutrition.

Food is usually cited as a textbook example of a commodity with a relatively low price elasticity of demand. No matter how low prices fall, there is an upper limit on the quantity of food a household will consume, the argument goes, and no matter how high they rise, there is a minimum which every household must consume for survival. This relationship certainly holds for the developed nations, where incomes are high and the majority of consumers obtain supplies of food which are at least adequate to permit normal growth and maintenance of health. In developing countries with low per capita

incomes, the price elasticity of demand for food is,in fact,high among the lower income groups.[25,26,27] As prices rise, poor consumers reduce their purchases of food. This is to be expected, since typically in developing countries, the low-income population devotes well over half of its income to food, and more than half the population may qualify as low-income. The average level of food consumption per capita in these countries is often close to the minimum needed for the maintenance of health, and there is considerable evidence that food consumption among the underprivileged is generally below that minimum. Under these circumstances, it may be expected that a rise in real food prices would have serious consequences for food consumption, and therefore for the health of the low-income population. This would be the case for poor farmers as well as for poor urban consumers. High prices benefit food producers in proportion to the size of their marketed surplus, and low income farmers market a smaller proportion of their output than those who are better off.[28] Most poor farmers in developing countries are net food purchasers even though they market some of what they produce, and so would lose more than they gain from high agricultural prices.[29] It would seem, therefore, that while high food prices may fulfill several objectives of economic development, they may also prove detrimental to the immediate well-being of much of the population. Since,ultimately,the achievement of economic development in a country must be defined in terms of the improved level of living of its people, it seems perverse to adopt strategies of

development which reduce the already low living standard of the poor in order, indirectly, to improve it.

Consumer Price Subsidies

The problem facing governments is to allow an adequate level of consumption among the vulnerable poor while still maintaining price incentives to farmers. The fact that farm production is responsive to price incentives indicates that a level of food production insufficient to meet the needs of the population is due not so much to inadequate capacity to produce as to a level of effective demand too low to stimulate needed production. That is, the majority of consumers cannot afford to purchase food at prices high enough to cover the costs of increased production and improved technology. The most direct approach to solving the food problem would be to provide increased income to those groups with a high income elasticity of demand for food, that is, the poor.* In Pakistan, as in most countries, there are strong political and social pressures against such a solution. One alternative which has been used in a number of countries is a program of consumer price subsidies. Such programs have been implemented for a variety of reasons: 1) to ensure equitable distribution of food during periods of shortage; 2) to minimize social disruption in cities, often a function of rising food prices; 3) to stimulate investment in the industrial sector; 4) to provide assistance to the needy.

* This assumes that food supply would increase promptly in response to an increase in demand. In fact, the more likely result would be inflation in the short run. These conditions would appear to constitute an ideal setting for a timely infusion of international food aid.

Although the last of these has not been a major motivation in establishing these systems, it appears that consumption subsidies under some conditions may have important nutritional and income distributional effects.

These programs are frequently criticized because of the presumption that they involve high budgetary requirements, substantial adminstrative opportunity costs, a high proportion of leakage to non-needy groups, and a depressing effect on agricultural prices and production. While these characteristics have been associated with consumption subsidies in some countries, it is not clear that any of them are inherent in the concept of subsidizing consumer prices. We believe that a program of consumer price subsidies can operate effectively and avoid the problems mentioned above if four conditions are met. First, the program must be one in which the government has the flexibility to control it own level of cost. If the program is committed to a fixed selling price, as for example, Sri Lanka was with its free rice ration, and if the procurement price is rising both domestically and on the world market, then the total cost of the program must continue to rise without limit, rendering it prohibitive*. If the selling price of the subsidized commodities is permitted to vary, then the government can keep the cost of the

* The question of what constitutes a prohibitive level of cost is a matter of policy for each nation. Governments routinely commit themselves to quite costly non-investment programs in areas such as defense, and there is no obvious reason why nutrition programs should not merit similar levels of spending. However, most governments limit their expenditure on these programs, and nutrition planners and advocates must learn to maximize the effectiveness of the level of spending which the government finds acceptable.

subsidy within such limits as it finds necessary. If inflation is affecting the whole country, it should be possible to raise the retail price of the subsidized foods without affecting the real benefits to consumers.

A second condition for a successful program of subsidized food distribution is that there must be means of limiting the quantity demanded. As long as a commodity is sold at a price below that on the unregulated market, demand for that product will exceed the supply. If no control is placed on the amount distributed, the government will be forced to procure ever-increasing quantities at ever -higher prices, once again causing prohibitive levels of cost. Such a situation occurred with the Egyptian subsidy on wheat and bread, which could not be maintained due to excessive costs. It would appear that subsidized distribution must be integrated into a rationing system in order to be viable. The ration should be set high enough to make a substantial nutritional contribution, but not so high as to encourage wasteful consumption.

A third criterion for a program which subsidizes food consumption is the degree to which the subsidized commodities reach the target group, that is, the poor population. A cost-effective program will be one in which the market for the subsidized foods is differentiated in such a way that only, or mostly the poor obtain them. In theory this can be done administratively, by restricting eligibility for

the foods to those who qualify through a means test. Such a method of targeting is difficult to put into practice in low-income countries where wage and income records are not commonly kept (making the administration of a means test a bureaucratic nightmare) and where regulations are easily circumvented by those with some influence. However, much the same effect can be achieved by selecting for subsidy foods which are automatically chosen by the low-income population and rejected by the relatively wealthy consumer.[30] If the foods which are subsidized are considered inferior, even though they are wholesome and nutritionally valuable, then the desired targeting should take place by consumer self-selection, without the use of a cumbersome and costly bureaucratic structure. Futhermore, it is our hypothesis that general price subsidies are potentially acceptable in large part because their benefits are available to all income groups, rather than being confined to the poor. In Pakistan, pre-ground, whole wheat flour, made in part from imported wheat, is the product which is subsidized. All of these characteristics render it less desirable than wheat and flour available on the open market, and so the subsidized flour is consumed disproportionately by the target group.

The final condition for a consumer subsidy program is that procurement and distribution of the subsidized commodity take place without depressing the overall level of prices received by farmers. It may be argued that, if some fraction of the supply of a food is

sold at below-market price, and particularly if additional supplies are brought in from abroad and sold at this low price, the price of the open-market supply will be driven down, since the residual quantity demanded will be reduced. This would not be the case, however, if the subsidized food were differentiated as described above. If the subsidized product is inferior, due to its processing, packaging, or even simply due to the fact that it is subsidized, then the demand-- emanating from a different group in the population-- for the superior, free market varieties should remain relatively unaltered. Furthermore, the superior varieties are consumed by the economically more advantaged population, whose demand is relatively quite inelastic with respect to price. Therefore, farmers and retailers should be able to raise the price for these varieties in order to compensate themselves for the smaller total size of the market for their product. There is no inherent reason why domestic procurement for a subsidized food consumption program must necessarily take place at prices too low to compensate farmers for their costs and labor. Such price-restraining mechanisms as restrictions on grain trade between surplus and deficit areas of a country, used in some countries which have food subsidies, are not an integral part of the concept of a food subsidy. Even if some fraction of total output is procured at low prices, however, it should be possible for farmers to make up for their losses by charging higher prices for the remainder. In this way, the relatively wealthier population

contributes to the subsidy for the consumption of the poor,[31] and the conflict between maintainance of high producer prices and implementation of low consumer prices is to some extent resolved.

II. THE RATION SYSTEM IN PAKISTAN: DESCRIPTION

The Government of Pakistan operates a network of shops throughout the country which are outlets for two commodities: whole-meal atta (100% extraction flour), and refined white sugar. It is the distribution of atta with which we will be concerned in this discussion. In the case of sugar, the program acts simply as a rationing mechanism to ensure equitable distribution of a scarce commodity: there is no direct subsidy on the price of sugar. The Government is a monopoly trader, and controls prices from producer to consumer. The consumer price of sugar is set at a level which will cover the Government's costs. The high black market price is due to the small supply available outside Government-controlled channels, and does not reflect the price paid to producers. Furthermore, sugar, far from being an inferior good, is a luxury commodity with a high income elasticity of demand among all income groups. Atta distribution on the other hand, fulfills most of the conditions we have posed for an effective and viable food price subsidy program. While the size of the ration is fixed, the retail price is not, so that the Government can exercise control over the total cost of the program. The ration atta itself is an inferior good, both because it is preground and therefore subject to adulteration, and because it is made partly from imported wheat which is not preferred by Pakistani consumers. Since the quality of the atta is poor, the program achieves some degree of targeting

toward the needy without administrative imposition of a means test. Another effect of the poor quality is that the market for wheat and wheat flour is clearly differentiated, permitting producers and retailers to charge a premium for the non-rationed products.

The ration system did not originate as a nutrition intervention or as a mechanism for income redistribution. The benefits of the program are available to everyone; even if the wealthy choose not to purchase the atta, they know the option is open to them. The fact that ration shops are also the outlet for sugar is probably an additional source of strength. The program therefore is not perceived as an obvious income transfer.* Meanwhile, a large proportion of Pakistan's urban population has become dependent on ration atta, so that politically, it would be exceedingly difficult to dismantle the program.

History of the Ration System

The history of the ration shop system reflects the development of Pakistan's agricultural price policy. The first ration system was in fact established before Pakistan became an independent nation: it was created by the British in 1942 as a short term response to an acute shortage of goods due to wartime disruption of trade and diversion of domestic resources. At that time, wheat was distributed through specially licensed retail outlets at the rate of six chattaks

* This is as likely to be a political advantage in Pakistan as in the U.S., where the Family Assitance Plan was defeated in the Congress the same year that the Food Stamp Program was expanded to give benefits greater than those which the straight income maintenance program would have provided.

(12½ ounces) per person per day, and sugar, tea, matches, kerosene, yarn and cloth were also available through ration shops.

After Partition in 1947, the rationing system was continued in order to control the hoarding and profiteering on goods still scarce as a result of the war.[32] However, between 1947 and 1950, there was no shortage of foodgrains. Wheat prices fell, and the government abandoned rationing, although the statute permitting it remained in effect. At the same time, a minimum support price was established to benefit farmers. In 1950, floods reduced the supply of wheat, and the Government once again imposed rationing and subsidized consumer prices through the ration shops. During the fifties, the price and supply situation fluctuated, as did the Government's procurement activities. Throughout this period, the Government of Pakistan maintained monopoly control of foodgrain marketing. All grain which was marketed had to be sold to licensed commission agents at a fixed price which was set by the Central Government before the sowing season. The government then purchased what it required for supply to the ration shops and for its other needs, paying the set price plus about 18% for incidental expenses and agents' commissions. The Government absorbed the cost of this margin, and sold the wheat to flour mills at the procurement price. In some years, all the wheat on the market was purchased by the Government. Movement of grain within the country was strictly controlled: no wheat could cross Provicial boundaries except on

Government account. Export of wheat was prohibited. All of these restrictions depressed the price which farmers received for their grains, and thus reduced the incentive to increase production. Domestic production did not keep pace with population growth during the decade, and imports were required in order to prevent a reduction in average per capita availability of grain. The U.S. started sending wheat to Pakistan under P.L. 480 in 1956. This wheat was used to help maintain low consumer prices by means of distribution through the ration shop system and through the open market.

In 1959-60, the Government shifted to a positive price policy. It also instituted free trade in grain in order to encourage production. The support price of wheat was raised from Rs.12.50 to Rs. 13.50 per maund (82 pounds)*, and compulsory sales as well as restrictions on movement of grains within the country were abolished. A price stabilization policy was adopted, whereby the Government would purchase all the grain voluntarily offered by producers at the minimum support price. Government stocks of grain would be released on the market if the price rose above the maximum set by the Government, which was Rs. 16.00 per maund in 1960-61. The purpose of this policy was to provide incentives to farmers for increased production and to aid industry by reducing fluctuations in the price of the key wage good.[33] At the same time, statutory rationing was abolished. Nonetheless, the

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* The Pakistani rupee is worth (in 1975) about ten U.S. cents.

ration system continued to operate, distributing atta and sugar.

During the early sixties, when supplies of wheat were significantly increased, the differential between the free market price and the fixed price was eliminated. Ration shops continued to distribute atta, but with no limitation on the quantities to be purchased. They simply functioned as outlets for the grain which the Government continued to procure because of its guaranteed purchase policy. This was the situation until the middle sixties, when two years of bad weather as well as war with India disrupted domestic production. At the same time, U.S. food aid was reduced. The support price of wheat was raised to Rs. 17.00 per maund to encourage production, and rationing of atta was reinstituted to deal with the scarcity. The retail price of atta in the ration shops was manipulated in part as a means of stabilizing free market prices.

Rationing of atta has continued up to the present. The Government which came to power in December 1971 had an explicit policy of serving the consumption needs of the population by means of price stabilization and increased production. Procurement prices were raised from Rs. 17.00 to Rs. 22.50 per maund in 1972-73, and monopoly procurement was reinstituted in some areas (e.g., Punjab). An attempt was made to keep the wheat issue price to the mills at its earlier level (between Rs. 17.00 and Rs. 18.00 per maund), but in 1973-74, the issue price was raised to Rs. 21.50 per maund, while at the end of the year the procurement price rose to Rs. 25.50 per maund in an attempt to raise

domestic production and reduce dependence on imports. This meant that the Government subsidy on atta amounted to Rs. 4.00 per maund, plus the cost of procurement. The price was held constant in 1974-75, but raised in 1975-76 to Rs. 37.00 per maund for procurement, and to Rs. 35.00 per maund for issue to the mills. Accordingly, the Government's expenditure on the subsidy was reduced from Rs. 4.00 to Rs. 2.00 per maund, a move which was necessitated in part by the increasing financial burden of importing wheat at world prices.[34] Distribution of sugar has been a function of the ration shops since the Korean War. Since 1972, the ration system has had a monopoly on trade in sugar. In 1972-73, the system also was used to distribute vegetable oil, which was in short supply. Oil is now sold in ordinary stores. In 1975, atta sold at a retail price of Rs. 37.00 per maund (Rs.1.00 per kg.), compared with an open market price of about Rs. 48.00 per maund (Rs. 1.30 per kg.). Sugar costs Rs. 4.60 per kg. (about 2 pounds) in the ration shops, while black market prices are reported to be Rs. 8.00 to 10.00 per kg.

The Bhutto government also initiated a concern for what it termed "consumption planning." This term implies that planning to ensure a minimum level of consumption of basic necessities by all population groups is as important as traditional production planning. The already existing ration shop system was seen as a primary instrument for the implementation of its consumption-oriented policies.

Operation of the Ration System*

a) Administration

The ration shop system is operated primarily at the level of the Provincial governments. The Central Government is responsible only for allocating imported wheat to the provinces and other Government departments, and for establishing general policy relating to the shops. Policy issues which are centrally determined include the procurement price of wheat from the farmers each year, the issue price of wheat to the mills, and of flour from the mills to the ration shops and to the consumers, the quantity of wheat to be procured in each province, and the size of the ration allotment of atta and sugar. Since October, 1974, the Central Government has also laid down regulations to control the milling of atta for public distribution, requiring mills to operate exclusively for the program, and to produce only 100% whole meal atta. Prior to that time, milling regulations were determined at the provincial level, and varied from one province to another.

Details of the program's administrative structure are presented in the Appendix.

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* The information on which these sections and the appendix are based came in part from personal observations by one of us (BLR) of ration shops in Karachi, Lahore, and in the neighborhood of Rawalpindi, and from visits to a procurement center and a flour mill in Punjab. These visits involved informal conversations with ration shop customers and owners, and with food program officials in one district of Punjab These people appeared to speak freely, and did not seem hesitant to discuss the program or their own experiences and attitudes. One caveat should be applied, however: the data are derived almost entirely from large cities and easily accessible rural areas; more remote areas may present a different picture. We are presently planning a more extensive study, using more formal methods of data collection.

b) Pricing

The procurement price of wheat is a matter of agricultural policy, and is intended to be set high enough to encourage increases in production by covering the costs of agricultural inputs, including those required for modernization. As would be expected, establishment of the price is subject to considerable political pressure, with farmers moving to raise the price, and the urban population seeking to lower it. In one year, the price was lowered from Rs. 17.00 to Rs. 15.00 per maund for three months, after which farmers' protests forced the price back to its original level. Since 1969, the rate of inflation has been so high that procurement prices, announced as support prices, have consistently been below open market prices at the time of harvest.

Table I shows the procurement, issue and retail prices for ration atta from 1968-69 to 1975-76. It shows that the rate of Government subsidy (that is, the difference between the procurement and the issue price) was only the cost of the procurement process until 1972-73. In that year, the size of the subsidy increased to Rs. 5.50 per maund and was then reduced to Rs. 4.00 in 1973-4, and to Rs. 2.00 in 1976-76.

Table I: Procurement, Issue, and retail prices for Ration Atta (end of fiscal year; in rupees per maund)

Year	Procurement	Issue	Retail
1968-9[a]	17	17	18.4
1969-70[a]	17	17	18.4
1970-1[a]	17	17	18.4
1971-2[b]	17	17	18.4
1972-3[c]	22.5	17	18.4
1973-4[c]	25.5	21.5	22.9
1974-5[c]	25.5	21.5	22.9
1975-6[d]	37	35	38

a. AID figures, Pakistan desk, Washington, D.C.
b. Pakistan Economic Survey 1971-2
c. AID Islamabad figures
d. Personal observation, September 1975

The mechanism by which the issue price is set could not be precisely determined, but appears to be an ad hoc process based on the amount of subsidy which the government considers feasible. The reduction in subsidy in 1975-6 was the result of greatly increased costs in the previous year. Imports of wheat were increased in that year due to a poor crop in 1973-74, and imports were contracted at a time when market wheat prices were high ($204 per ton). The total wheat import bill for 1974-75 was Rs. 3,000 million, and according to the Annual Plan for 1975-76, the issue price had to be raised in April, 1975 to offset this cost.[35]

This recent history indicates that ration shop consumers are not completely protected from fluctuations in price due to yearly changes in the supply situation, although the impact of market price changes is mitigated by the subsidy, and seasonal variations are largely eliminated.

c) Allotment

In urban areas, the allotment of atta is 1 3/4 kg. (3 pounds 15 ounces) per person per week for adults. The allotment for children under 14 years is half the ration, and no allotment is made for children under two. According to one food official, the size of the ration is determined by nutritional need, but it is not clear how such a determination could be made, since the ration commodities do not provide a complete diet. The ration of sugar is 1½ kg. per person per month in urban areas, and one quarter kg. in rural areas, with no reduction for children.

In unusual circumstances, the ration may be reduced. For example, in Tarbela Township, a resettlement town for people displaced by the dam, the population has been growing so rapidly that supplies can not be brought in fast enough, and shops have been distributing half-rations of both sugar and atta. In the town of Haripur, in N.W.F.P., the sugar ration was reported to be one kg. instead of 1½. No explanation for this reduction was given.

The Household Income and Expenditure Survey of 1971-72[36] found that in urban areas, average per capita consumption of wheat flour in

a month ranged from 9.7 to 13.5 kg. per person, compared with 7.5 kg. available through the ration shops. This finding is consistent with the common practice of supplementing the ration with wheat purchased on the open market. However, a survey of grain consumption habits in Karachi and Lahore conducted in 1974[37] found that in the group with household income below Rs. 250 per month (a group which constitutes about 45% of the urban population), 66% of those interviewed in Karachi, and 79% of those in Lahore purchased ration atta exclusively. Tables II and III show the types of atta consumed by households in different income groups in the two cities. This survey found that a substantial proportion of the population in these cities is dependent on ration shops for its atta. The increase in the real price of flour on the open market since 1971 probably accounts for the difference in findings between the Income and Expenditure Survey and the later study.

d) Supply of Wheat to Ration System

Wheat is supplied to the ration shop system both through government purchase of domestically produced grain and through imports. Table IV shows the quantity of wheat for government operations which was obtained from domestic procurement and from imports for 1973-4 and 1974-5, and the projected amounts for 1975-76.

Table II: Source of Atta Consumed by Households in Lahore[a*]

Monthly Household Income	No.	Ration Depot	Open Market	Mix	Self-Ground	Own Lands
< 250	275	79%	16%	1%	4%	2%
251-500	362	53%	38%	1%	12%	2%
501-700	161	36%	48%	1%	14%	3%
701-1500	166	16%	49%	1%	25%	10%
> 1500	36	6%	61%	-	22%	11%

a. Source: Nasir-ud-Deen Associates, Roti Report

Table III: Source of Atta Consumed by Households in Karachi [a]

Monthly Household Income	No.	Ration Depot	Open Market	Mix	Self-Ground	Own Lands
< 250	426	66%	8%	16%	11%	-
251-500	512	49%	19%	14%	19%	-
501-700	220	30%	22%	14%	35%	-
701-1500	215	26%	31%	12%	32%	-
>1500	102	34%	42%	4%	20%	-

a. Source: Nasir-ud-Deen Associates, Roti Report

* Note: The percentages do not add to 100% because some respondents purchase both open market and ration depot atta without mixing the two. These are consumers who use the ration atta until it is exhausted and then supplement it with open-market atta, and, as would be expected, they fall mainly into the lower income groups.

Table IV: Source of Supply for Government Wheat Operations[a] (thousand tons)			
Year:	1973-4	1974-5	1975-6[b]
Opening Stocks	86	96	237
Domestic Procurement	1320	1233	1100
Imports (adjusted for crop year)	1040	1168	1432
Offtake	2175	2260	2415

a. Source: Annual Plan 1975-76
b. Projected

Government operations in wheat are not exclusively geared to the ration system. Ration distribution constituted about 55% of Government operations in wheat in 1974-75. The rest included free distribution to consumers in Azad Kashmir and the Northern and Centrally Administered Areas, supply to the military, and to institutions such as schools and prisons. The ration system includes the ration depots, which sell atta to private consumers at controlled prices, and also covers retail establishments such as bakeries, tandoors (small bread-baking establishments), and restaurants which have applied to the District Food Controller for permission to purchase ration atta.

1) Imports

In 1973-74, about 32% of wheat imports were on a commercial basis, while the rest were credit sales and aid. The breakdown of

imports by source for that year is shown in Table V. The quantity of food aid from the United States has been subject to considerable fluctuations, and has been falling off since 1972-3.

Imported wheat is not distributed evenly throughout the country, because of the unequal cost of transportation to different areas. Atta supplied to Karachi (the port) is more frequently made from 100% imported wheat than that supplied in other areas, and Karachi virtually never receives atta made entirely from domestic wheat, as does Punjab, for example.

Table V: Wheat Imports to Pakistan by Source, 1973-4

Source	Quantity (tons)
PL 480 Title I	100,000
World Food Program Food Aid	269,000
U.S. C.C.C. Credit	171,000
Canada cash/credit	246,000
Cash Purchase from U.S.	362,000
Cash Purchase from Turkey	20,000
Total	1,168,000

a. Source: Pakistan Economic Survey, 1974

Imported wheat is considered inferior by Pakistani consumers, because its color is darker and it has somewhat different taste and baking properties from domestic wheat.*

* This is one factor which makes ration atta poor in quality from the consumer's point of view, and contributes to the targeting of the program.

2) Domestic Procurement

Due to poor crop yields in the past three years, domestically produced wheat has been a declining proportion of Government operations and the absolute quantity procured has followed a similar trend, while the amount procured has constituted an increasing proportion of total domestic output. Table VI shows the quantity of wheat domestically procured since 1971-72, and the percentage it represents of domestic production, and of total Government procurement in that year.[38]

Table VI: Procurment of Domestic Wheat for Government Operations

Year	Quantity Procured (tons)	% Production	% Gov't Operations
1971-2[a]	828,000	13	63
1972-3[a]	205,000	3	12
1973-4[b]	1,320,000	16	56
1974-5[b]	1,233,000	18	51
1975-6[b,c]	1,100,000	19	43

a. Pakistan Economic Surveys
b. Annual Plan 1975-6
c. Projected

It is the policy of the Food Departments in both Sind and Punjab that grain may not move out of the province, or from surplus to deficit districts within the province, except on government account.

This policy enables the Food Department to purchase domestic wheat at relatively low prices in surplus areas and distribute it through the ration shops in deficit areas at lower cost than would be possible in a free market, thereby reducing its costs. One unfortunate result of this policy is that it lowers farm prices and thus reduces the incentive for greater production in those areas which have the highest agricultural production potential. The extent to which movement restrictions are circumvented by smuggling or black market operations was not investigated.

III. THE RATION SYSTEM IN PAKISTAN: ANALYSIS

Nutritional and Economic Impact of the Ration System on Consumers

The ration system at present distributes only two commodities: sugar and atta. The atta ration of 0.25 kg. (8 ¼ ounces) per person per day, if it is all purchased and consumed, provides 770 calories and 27 grams of protein.[39*] This is enough to fulfill 25% of the recommended intake of calories and 72% of the recommended protein intake recommended for an adult man, or 38% of the calorie and 93% of the protein intake recommended for an adult woman.[40 **] In this dicussion,

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*It should be remembered that, even though atta can supply a high percentage of the protein requirements for an individual, wheat by itself is an inadequate source of protein because of its incomplete amino acid structure, and the diet would have to include some protein complement such as a pulse, or some animal protein, in order to satisfy dietary protein requirements. Accordingly, these protein figures can be misleading.

**The subject of minimum requirements and recommended allowances of nutrients is a source of continuing discussion and controversy among nutritionists, and it must be recognized that at present there is no one universally accepted set of values for nutrient intake requirements. The values we have used in our calculations are the WHO estimates of recommended calorie and protein intake for a reference man and woman of moderate physical activity. This is the activity level most likely to apply to urban residents. These values are almost certainly high, since they are calculated to provide a margin of safety for the population. FAO has derived regional estimates of per capita calorie requirements based on the age and sex distribution and physical size of the population in different regions of the world The daily calorie requirement per capita for Asia is estimated at 2210 . calories. If we had used this figure as the basis for our computations, we would have found that the calorie supplement provided by the ration atta constituted 14.25% of requirements for the Rs. 50-99 income class and 11.81% of requirements for the income class of Rs. 200-249. Given the degree of individual variation which exists, any specific figure which represents nutrient requirements or the contribution of a particular food must be viewed as an approximation.

we will not consider at any length the nutritional impact of sugar distribution, since the rationing of sugar does not involve a subsidy and is not intended to raise nutritional levels, but rather serves to ensure wide distribution and availability of the commodity, and to prevent hoarding and profiteering. Furthermore, sugar consumption, according to the 1971-72 Household Income and Expenditure Survey, was well below the ration quota of 1½ kg. per person per month in the cities for all income groups up to Rs. 750 per month, that is, for 93% of the population. In rural areas, the sugar quota is one quarter kg. per person per month, an amount which can make only negligible caloric contribution to the diet, and which in any case is more than consumers in the lower income half of the rural population could purchase in 1971-72. Sugar prices have risen by 150% since the survey was taken, while average income has risen by only 82%, so it is likely that consumption among lower income groups has declined, if anything, especially since refined sugar is a luxury commodity with a high income elasticity of demand in the lower income population, and there are readily available cheaper substitutes (gur and shakkar) on the market.

By the same reasoning, the consumption of ration atta has probably increased in the past five years. Prices of both ration and open market atta have increased sharply since 1971-72. Ration atta has gone from Rs. 18.40 per maund to Rs. 37.51, an increase of 104%, and open market atta has risen from about Rs. 20.00 to Rs. 48.00

and higher,[42] an increase of at least 128%. In response to declining real income, consumers tend not only to reduce the quantity of most items consumed, but also to turn to cheaper, lower-quality varieties. This highly elastic demand for quality is most strongly evident in the middle income group (Rs. 250-299, the interval which contains the median household income for the population), but is also evident among the poor (Rs. 50-99).[43] Since ration atta is lower in price and generally believed to be poor in quality, reliance on ration atta in the middle and low-income population has probably increased during the past five years.

The nutritional impact of the ration program is determined by the amount of additional nutrient intake made possible by the price subsidy, beyond what would be purchased at the free market price. Of course, the free market price of wheat and wheat products will be higher in the presence of a divided market, due to Government procurement for the ration shops, than it would be if there were no ration program. The true value of the subsidy would be measured by the difference between the subsidized price and the hypothetical market price in the absence of Government intervention. For the purposes of this paper, and recognizing the inaccuracy involved, we are using the existing open market price of whole-meal atta as the basis for calculating ration program benefits, since calculation of a hypothetical price would require complex econometric analysis and almost certainly would yield no greater accuracy, given the uncertainties involved.

If one makes the assumption that, for some consumers, the amount of money available for atta consumption is fixed, so that any increase in the price of atta requires a proportional decrease in consumption, then the nutritional contribution of the ration program is exactly equal to the proportion by which its price of atta is lower than that on the open market.* In September, 1975, the price differential for atta was about one third, so by the above assumption, individuals who purchased their entire ration would receive a daily supplement equal to one third of the nutritional contribution of the atta, or 254 calories and nine grams of protein (8.6% of calorie and 24% of protein requirements for an adult male), which they would not have received had they paid the open market price.

Two factors are critical in determining the extent of nutritional benefit received by consumers of a subsizided commodity. One is the price elasticity of demand for the food; the other is the cross elasticity of demand for other items, i.e., the way in which consumers spend the income increment represented by the subsidy if they do not use it all in purchasing the subsidized commodity. If the price elasticity of demand is high, then a relatively small decrease in price due to a subsidy will result in a disproportionately

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* We would expect this assumption to be largely applicable to the lower income classes for whom purchasing power is the major constraint on consumption. In the lowest income groups, the nutritional contribution of the ration may be greater than we have calculated since consumers might divert more of their income to the commodity as it becomes a "better buy." In higher income groups, where the price elasticity of demand for food is close to zero, the actual nutritional contribution of the subsidy on atta is probably nil.

large increase in the consumption of that commodity. If the cross elasticity of demand for other goods is high, then as the price of a commodity such as atta is lowered, consumers will not increase the quantity they purchase, but will use the money freed up by the lower price to purchase other goods instead. In this case, as in the earlier one, a price subsidy would have the effect of an income supplement, but its nutritional impact would depend on the extent to which consumers use the supplement to purchase more food. Such behavior is, in large part, a function of income, the poor having a higher price elasticity of demand for food. When the price of a food staple such as ration quality atta falls, the lowest income groups are likely to increase their consumption of the commodity unless there are readily available, preferred substitutes which are price-competitive.

Reliable estimates for the price elasticity of demand for atta among different income groups in Pakistan do not exist. However, expenditure elasticities for wheat and wheat flour have been calculated by McCarthy[44] for three income classes. These are shown in Table VII below.

Table VII: Expenditure Elasticity of Demand for Wheat in Pakistan

Income Group*	Rs. 50-99	Rs. 250-299	Rs. 1000-1499
Elasticity	2.8	.37	-.65

* The low income group is in the bottom 2% of urban population, the middle income group represents about the median urban income, and the high group is in the top 2%.

Expenditure elasticities approximate income elasticities of demand. These tend to approximate price elasticities in cases where the commodity in question represents a substantial proportion of the household budget. Wheat purchases account for 32% of the household expenditure of the low-income group shown in the table, 24.2% of that of the middle income group, and 13% for those of high income.[45] Therefore it may be assumed that, at least for the lower two groups, these expenditure elasticities reflect at least the order of magnitude of the price elasticities of demand. These values were calculated for the whole class of wheat and wheat flour, which includes a range of commodities of varying quality. Since the demand for quality also varies with price and income, it is likely that the demand elasticities for ration atta alone are higher than for wheat flour as a class, particularly for the middle and low income groups.

The effectiveness of a nutrition intervention may be measured first, by the magnitude of its benefits, and second, by the extent to which those benefits reach all or most members of the target group, and do not reach those outside it. A nutrition intervention ideally should reach a high proportion of the target group, while excluding, to the extent possible, all others, in order to economize on resources.[46] Of course, the definition of the target group is critical in evaluating the effectiveness of a subsidy. If one defines the entire lower half of the population as needy, then the program will have a higher cost-effectiveness than if only the bottom ten percent are included

in the target. An up-to-date survey of nutritional intake in Pakistan would identify income groups whose diets are deficient and thus empirically define the target group. In the absence of such information, we have arbitrarily considered as needy all those whose incomes fall below Rs. 250, or about 45% of the population. In the case of a price subsidy, McCarthy[47] has posed a set of criteria for selecting the food to be subsidized in order to maximize the effectiveness of the subsidy in reaching the low-income population. These criteria include: 1) a high fraction of total consumption of the food by the poor; 2) a high price and income elasticity of demand for the food among the poor and 3) low or negative elasticities among the more well-to-do. Atta fits these criteria fairly well, and ration shop atta, due to its inferior quality, fits them even better. As a result, ration shop distribution of atta should be effectively targeted to the poor, and available evidence indicates that this is the case.

The Roti Report[48] survey asked consumers in Karachi and Lahore where they purchased their atta. As shown in the first column of Table VII, the percentage of respondents who reported purchasing atta from ration shops declined with increasing income. The same table shows the percentage of all ration shop users who are drawn from each income class of the population, and the proportion which this is of their percentage representation in the population as a whole. Thus in Lahore, of the income class from Rs. 0-250 per month

(a class which represents 45% of the urban population), 79% reported purchasing ration shop atta. This class comprised 59% of all ration shop users, and its representation among ration shop users is 1.31 times its representation in the population as a whole. The top 1.8% of the population, with household incomes above Rs. 1500, represented only 0.2% of ration shop users. In Lahore, 97% of ration shop users were drawn from the lower 85% of the population, an indication that the targeting of the program toward the needy is reasonably effective. The same targeting is seen in the Karachi data, although the effect is not so sharply drawn. The overall participation rate in Lahore is 60.4% and in Karachi it is 53.4%. This is consistent with the fact that ration shop atta is considered poorer quality in Karachi than in Lahore, because of the higher proportion of imported wheat it contains.

Unfortunately, information has not been collected on the use of ration shop atta among groups representing smaller sized income intervals in the population. On the basis of existing information, we can infer that as household income decreases, the rate of participation in ration shop atta distribution rises. However, there is no empirical basis for estimating participation rates among the bottom 3% of the population (income below Rs. 100) or the bottom 13% (income below Rs. 150). It is possible to create a curve for participation in the ration atta program as a function of household income, using the Roti survey figures as estimates of participation at the midpoint of each

Table VIII: Ration Shop Use by Income Class in Karachi and Lahore

	Lahore				Karachi		
Monthly Household Income (Rs.)	Percent of Urban Population	% Using Ration Atta	% Users in Income Group	Proportion of Representation in Population	% Using Ration Atta	% Users in Income Group	Proportion of Representation in Population
0 -250	44.9%	79%	59.0%	1.31	66%	55.4%	1.23
250-500	39.2%	53%	34.0%	.86	49%	36.0%	.92
500-700	8.6%	36%	5.0%	.58	30%	4.9%	.57
700-1500	5.5%	16%	1.5%	.27%	26%	2.6%	.47
>1500	1.8%	6%	0.2%	.09%	34%	1.1%	.61

income class.* This curve projects a participation rate of 100% among the lowest income groups (Rs. 0-50 per month). It is not known whether mobility, the lack of a fixed address, fear of the bureaucracy, or sheer discrimination might deter the very poorest members of society from purchasing ration shop atta, and thus reduce the level of participation. This is one of several aspects of the program which still require empirical investigation. In the following discussion, we have made the assumption that the maximum participation rate is 90%, and we have interpolated participation rates for smaller income intervals accordingly.

In order to estimate the nutritional benefit from ration atta distribution received by persons in each income class, we took the average household consumption of wheat and wheat flour from the 1971-72 Household Income and Expenditure Survey.** In view of the increase in the real prices of food and other commodities since that time, this quantity probably overstates the present level of consumption. We multiplied this quantity by the participation rate of the income groups, making the (rather heroic) assumption that the proportion of the income group which uses ration atta might reflect the proportion of ration atta in the wheat consumption of that group. Making the further assumption that all of a household's atta is evenly distributed

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* Midpoints were calculated by breaking the class into smaller intervals and weighting each by its percentage representation in the urban population. Data for Lahore were used.

** This was average per capita consumption multiplied by the number of household members. No adjustment for children was made in the survey, and so we made none in reversing the calculation.

among the members,* we then divided by the average number of household members to obtain an estimate of the amount of ration atta consumed by an individual in a month. The amount which may be considered a supplement was calculated at one third of the total, that is, the proportional difference in price between open market and ration atta. The results of these calculations are presented in Table IX. In this table, no adjustment was made for the number of wage earners per household, as was done for the subsequent table, since here we are concerned with the effect of the program on the individual, not on the family unit. It will be noticed that for the target low income groups (those under Rs. 250), average per capita consumption of ration atta calculated in this manner exceeds the allotment of 7.5 kg., even without considering the reduction for minors and infants. This is one indication that wheat and flour consumption must in fact, have declined between 1971-2,

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* This is the assumption made in the Income and Expenditure Survey, and for these purposes it is an assumption we are forced to make, since we have no information about the number of children per household in different income classes. We do know that a larger proportion of family members are children in upper income families--- a condition which, incidentally, should tend to reduce the available per capita benefit of ration atta in these higher income groups. We also know that children consume smaller quantities of food than adults. Depending on their age and rate of growth, children's absolute requirements for calories and protein are lower than those of adults although they are higher per kilogram of body weight. While it is usually assumed that the consumption levels of children are more deficient than those of adults in the same family, a detailed study of intra-family food distribution patterns would be needed to determine the likely distribution of atta under varying income and price conditions.

Table IX: Nutritional Benefit from Ration Atta by Income Class

Monthly Household Income (Rs.)	Number of Members in House-Hold	% Parti-cipation	Monthly Consump-tion (kg.)	Daily Sup-plementary Calories	% of Recommended calorie intake Male	Female	Daily Sup-plementary Protein (grams)	% of Recommended Protein Intake Male	Female
50-99	2.6	85	9.20 (7.50)	315 (254)	10.5 (8.6)	14.3 (11.5)	11.0 (9.0)	30.0 (24.0)	37.9 (31.0)
100-149	3.7	82	9.64 (7.50)	330 (254)	11.0 (8.6)	15.0 (11.5)	11.5 (9.0)	31.0 (24.0)	39.7 (31.0)
150-199	4.4	79	8.57 (7.50)	293 (254)	9.8 (8.6)	13.3 (11.5)	10.2 (9.0)	27.6 (24.0)	35.2 (31.0)
200-249	5.1	70	7.64 (7.50)	261 (254)	8.7 (8.6)	11.9 (11.5)	9.1 (9.0)	24.6 (24.0)	31.4 (31.0)
250-299	5.9	62	7.01	240	8.0	10.9	8.4	22.7	29.0
300-399	6.6	52	5.44	186	6.2	8.5	6.5	17.6	22.4
400-499	7.5	47	5.01	171	5.7	7.8	6.0	16.2	20.7
500-749	8.5	36	3.58	122	4.1	5.5	4.3	11.6	14.8
750-999	8.7	24	2.48	85	2.8	3.9	3.0	8.1	10.3
1000-1499	8.5	12	1.29	44	1.5	2.0	1.5	4.1	5.2
1499-1999	8.1	6	.58	20	.7	0.9	.7	1.9	2.4
>2000	8.6	4	.39	13	.4	0.6	.5	1.4	1.7

when the household consumption estimates were made, and 1974-5, when the ration shop participation data were collected. If we assume that 7.5 kg. per month is an absolute limit on ration atta purchases, then for groups whose estimated monthly per capita consumption exceeds the quota of ration atta, the amount of the quota (7.5 kg.) should be substituted. In this case, the nutritional supplement would be one third of the protein and calories in this amount of atta, or 9 grams of protein and 254 calories, amounting to 24% of the protein and 8.6% of the calorie requirement for an adult male. These figures have been inserted in Table IX in parentheses for comparison. In view of the widespread use of bogus ration cards, and given the practice by some ration shop owners of selling to needy consumers the atta unclaimed by other card-holders, it is possible that some households are in fact able to purchase quantities larger than the quota. Nonetheless, it is likely that this table somewhat over-estimates ration atta consumption in the lower income groups whose consumption .

is most likely to have been reduced by the rise in real food prices. On the other hand, the estimated nutritional contribution of the atta is based on the WHO determination of the requirements of an adult male. More than half the population consuming ration atta consists of women and children whose absolute needs (except in the case of pregnant and lactating women) are lower, so that the atta would make a proportionally greater contribution to their protein and calorie requirements.

One way to check the accuracy of the estimates is to compare the amount of atta which would be distributed based on these assumptions with the quantity actually distributed. Assuming that 30% of the population lives in urban areas covered by the ration program, the amount of atta distributed in a year based on the estimates used in the table would be 1,549,236 tons. Imposing a per capita limit of 7.5 kg. per month on ration atta consumption reduces this estimate to 1,440,300 tons. Aproximately 40% of the population of Pakistan is under the age of 14, and therefore would receive half the quota of atta. Assuming an equal distribution of minors among ration system users, and subtracting half the allotment of 40% of these users, we obtain an estimated total yearly distribution of ration atta of 1,152,240 tons. The actual quantity distributed in 1974-75 was 1,239,240 tons. Thus the estimates used in the tables probably overstate by about one sixth the total quantity of ration atta distributed. Much of this overestimate would be accounted for by the reduction for minors, which would affect all income classes, but which might not affect the estimates for nutritional contribution, since the nutritional requirements for minors are lower as well. The figures at least give an estimate of the order of magnitude of the nutritional contribution of the ration atta and the degree to which that benefit is targeted to the needy.

Using the same assumptions about participation rates and quantities of ration atta consumed, Table X presents estimates of the income contribution at different income levels represented by the subsidy on

the price of ration atta. The amount of the subsidy has been calculated in absolute terms and as a proportion of family income. As household income increases, the number of members and the number of wage earners in the household tend to rise. This means that income per capita and income per nuclear family (assuming each nuclear family is represented by a single wage earner) tend to rise less steeply than income of the household as a whole. In order to take account of this fact, the amount of subsidy has been calculated for the nuclear family, as well as for the household. Estimates for the nuclear family have been obtained by dividing both the household income (calculated at the midpoint of the interval) and the amount of the subsidy (estimated at one third the value of the ration atta purchased by the household) by the number of wage earners in the household. If the assumption is made that families can purchase only the 7.5 kg. per person allotment, then the monetary benefit for households below Rs. 250 in income would be as shown in parentheses in Table X. The amount of the subsidy as a proportion of income declines with increasing income over the whole range of income classes. While the absolute amount of the subsidy to the household increases as household income rises to Rs. 299, this is due to increasing household size. When correction is made for the number of wage earners, the amount of the subsidy to the nuclear family consistently declines with rising income, with the exception of the lowest income class. Estimates for the income group Rs. 0-49, have been omitted from these tables, because they are unreliable due to

Table X: Monthly Income Supplement from Ration Atta by Income Class

Monthly Household Income (Rs.)	% of Urban Population	No. Wage Earners	Nuc. Fam. Members	Nuc. Fam. Income	Subsidy to Household	Subsidy to Nuc. Fam.	Subsidy as % of Income
50-99	2.7%	1.1	2.36	68	6.58 (5.35)	5.98 (4.87)	8.77 (7.13)
100-149	10.15	1.2	3.09	104	9.80 (7.61)	8.17 (6.34)	7.86 (6.09)
150-199	15.5	1.3	3.38	134	10.37 (9.05)	7.98 (6.96)	5.96 (5.17)
200-249	16.5	1.4	3.64	161	10.72 (10.50)	7.66 (7.50)	4.79 (4.67)
250-299	12.6	1.6	3.69	172	11.38	7.11	4.13
300-399	17.7	1.6	4.13	219	9.88	6.18	2.82
400-499	8.9	1.9	3.95	237	10.32	5.43	2.92
500-749	8.9	2.0	4.25	312	8.36	4.18	1.34
750-999	2.9	2.0	4.35	412	5.94	2.97	.72
1000-1499	1.3	2.1	4.05	595	3.01	1.43	.24
1500-2000	.9	2.0	4.05	875	1.30	.65	.07
> 2000	.9	1.7	5.06	1471	.92	.54	.04

the small number of respondents in this group in the Household Income and Expenditure Suvey on which our consumption estimates are based. In the income class of Rs. 50-99, the amount of the subsidy is low both because of the small size of the family, and because their level of ration atta consumption is low due to their low income. A price subsidy is a form of income supplement which is available to individuals only to the extent that they can spend money to take advantage of it. In the case of ration atta,the upper limit to the supplement is theoretically the quota, but the lower limit is determined by the willingness or ability to purchase the subsidized commodity, and this may be limited in the case of the very poor. That is why it is important to keep the price of such commodities low and to select commodities which are normally consumed by the poor.

The calculations in Table X give a rough estimate of the income benefits provided by the subsidy on ration atta, and indicate that these benefits are skewed toward the lower end of the income scale. In order to calculate accurately the net benefit of the program, one would need additional information which is presently unavailable. First, since government intervention (procurement and rationing) has some inflationary effect on open market prices, an estimate would be needed of the difference between the open market price of atta and the hypothetical price in the absence of the program. One could then use household consumption data to determine where the burden of the higher price fell. Clearly it would fall most heavily on higher income groups who rely

least on the ration shops and purchase larger quantitites of wheat on the open market. A second factor in determining the net benefit of the ration program is the tax structure, since the costs of the program are covered by general revenues. Including this factor in the estimate would further skew the benefits toward the poor since income taxes are paid only by the top four percent of the urban population and the tax rates are progressive. In addition, the burden of other national sources of revenue would also have to be taken into account: tariffs, export taxes, charges for Government services, and other levies. The determination of who pays and how much they pay for the program would be made by calculating the cost of the program to each income group and subtracting the benefits obtained through use of the system. Such benefits could accrue either directly by consumption of the ration atta, or indirectly, for example, if the existence of the ration system has a depressing effect on wages paid to employees. In the latter case, of course, such an effect would also have to be taken into account in calculating the net benefit to the employee.

While the lower income groups clearly receive a larger porportional income benefit from ration atta distribution than do the relatively better off, there remains a large percentage of the total benefit which is reaching the non-needy. Thirty-eight per cent of the income benefits from the program (shown in Table X) reach the 42.5% of the population the household incomes above Rs. 300. The contribution which these

benefits make is negligible in terms of the income of the group, but it represents a large proportion of the total benefit derived from the program, and as such, may be considered a misallocation of resources. The question which must be asked, however, is whether any alternative program could reach the same number of low-income consumers and make an equivalent nutritional contribution while excluding the participation of the non-needy. Given the considerable administrative difficulty of targeting programs through means testing,* and the relative ease of circumventing such regulations, the answer is probably no. It is more effective , and certainly more politically advantageous, to reduce the incentive to participate among the well-to-do rather than to seek to exclude them by bureaucratic methods.

Cost of the Ration System

The monetary value of the income increment received by the consumer of ration atta is determined by the amount purchased and by the difference between the open-market and the controlled price. The cost to the Government of operating the system to distribute ration atta is determined by many factors other than the size of the ration and its price, and therefore there is no direct and consistent relationship between the cost of the program and the monetary and nutritional benefits which it provides. The Government controls some aspects of its costs which affect the benefits of the program, but there are others, such as the world market price of wheat, over which Pakistan has no control. In this section we will discuss the various elements which

* Even in the U.S. with large scale welfare and social security systems in operation and a relatively small percentage of eligible users, it costs $1.00 to provide a recipient with 50 cents worth of food.

contribute to the cost of the program, and we will explore the relationship between the program's cost and its benefits to participants. In a later section, we will attempt to evaluate the changes in program costs which would be likely to result from different program policies and from alterations in the supply situation for wheat.

The Government of Pakistan depended on imported wheat for about 52% of its operations in 1974-75. The proportion of imported wheat in government operations has risen in the past three years; it constituted 48% of the total distributed in 1973-74, and is projected to make up 50% of the 1975-76 total. It will be remembered that ration atta distribution is only a part of these operations. Wheat is also provided to the military and to Government-operated schools, hospitals and prisons, and it is distributed free in the Northern and Centrally Administered Areas and in Azad Kashmir. In 1974-75, ration distribution accounted for 55% of Government wheat operations. For the purposes of the present discussion, we will assume that all wheat which enters the system is randomly distributed through the various programs, that is, that 55% of imported wheat must go to ration shops, and 52% of the wheat distributed through ration shops in 1974-75 must have been imported.* The Government's expenditure on imported wheat for the ration system is determined by the difference between the import price which it must pay, and the issue price which it charges to the roller flour mills. Of course, the expenditure is in scarce foreign exchange

* It is likely that, in actuality, a higher proportion of domestically procured wheat is reserved for non-ration-shop-system operations, since it is considered better quality, and other operations may command a higher priority in receiving it.

while the return is in domestic currency. The issue price is set by the Government (and in turn determines the retail price of ration atta), but the world market price, and hence the cost to the Government of imported wheat is subject to wide fluctuations. For example, in 1973-74, the Government paid an average of $134 per ton for 1,168,000 tons of wheat on the world market. In 1974-75, it paid $204 per ton for 1,566,000 tons. Implicit in these facts is the apparent determination of the Central Government, stated explicitly in both the Annual Plan 1975-76 and the Pakistan Economic Surveys to maintain the quantity of wheat available to the population, in spite of high world prices or domestic production shortfalls. In view of this policy, it is impossible to predict for any year what the cost will be of wheat imports for the ration system, in order to budget for them. However, the high cost of wheat in 1974-75 prompted the Government to raise the issue price in August 1975, in order to reduce the total cost of the wheat subsidy. The increase in issue price resulted in a retail price increase of 66%, bringing ration atta more closely in line with the general level of consumer prices, which had been undergoing substantial inflation since 1970-71. Such a move by the Government indicates that higher priority is given to maintaining the quantity available through the ration shops than to maintaining an artifically low price level. Since average per capita income increased by 95% in the same period of time that ration atta rose in price by 104%, the impact of the price increase was not as great as its magnitude might suggest. The distribution

of the income increase is not known, however, and the impact of the price change on ration atta consumption among the needy has not been investigated.

The cost to the Government of domestically produced wheat is equal to the difference between the procurement price paid to farmers and the issue price to the mills. Table I, pg. 25, shows the procurement price, the issue price and the ration shop retail price for atta since 1968-9. From 1968-9 to 1971-2, the procurement price and the issue price were the same, so that the Government subsidy on domestic wheat amounted only to the cost of the procurement process: agents' commissions and allowances for incidental expenses, plus administrative costs. In 1972-3, the government attempted to maintain the issue price while raising the procurement price by Rs. 5.50 per maund. The following year, the size of the subsidy was reduced to Rs. 4.00, and for 1975-76 the subsidy was reduced to Rs. 2.00 per maund, as both procurement and issue price were raised. Based on the 55% figure for ration distribution as a fraction of Government wheat operations, the subsidy cost of domestic wheat in 1974-75, at the rate of Rs. 4.00 per maund, came to $7,341,652. The cost of imported wheat to the program, calculated at 55% of total wheat imports, less the amount for which it was sold at the issue price, was $125,606,170. The total cost of wheat for the ration program in that year was $132,947,820, an amount equal to ten percent of the nation's operating budget for that year.[49]

Another important item of cost to the Government is the jute bags in which the ration atta is transported. These bags are provided new by the Government for each year 's supply of wheat, and they remain with the ration shop owner to resell as part of his income. The amount of ration atta distributed in 1974-5 would require more than 13 million bags. Before the separation of Bangladesh, bags were provided by the then East Pakistan. Now they are imported from Sri Lanka. At the present price of Rs. 7.00 each, the cost of bags alone amounts to more than $9 million, or seven percent of the cost of the wheat. The cost of salaries for personnel to administer the program is another budget item, for which no estimate is available. A conservative estimate for the total cost of the program in 1974-75 would be $143 million, or about 10.8% of the Government's operating budget. With the reduced size of the subsidy on domestic wheat, and the reduced price of wheat on the world market, the program should cost substantially less in 1975-6, even though the total size of the program (as reflected by total government offtake) is increasing (see Table IV).

Dependence on Food Aid

In 1972-73, the Government of Pakistan imported 1,263,000 tons of wheat, an amount which constituted 76% of total procurement. Table V shows the breakdown of imports by source for this and the subsequent year. Of the 1972-3 imports, all but 50,000 tons, or only 3.3%, were

obtained as food aid on credit at concessional terms. Seventy-six percent of the imports came from the United States in the form of aid, and much of the remainder came from multilateral agencies at least part of whose supplies were donated by the U.S. In 1973-4, total wheat imports declined to 1,168,000 tons, and the proportion of concessional imports declined from 97% to 68%. The percent of imports supplied as aid by the U.S. declined to 23% and an additional 30% was supplied by the U.S. on a commercial basis. The U.S. has in the past three years reduced the quantity of food aid it has donated and has hardened the terms of its loans for the purchase of food. The possibility that food aid from the U.S. might be drastically reduced or eliminated raises serious questions for a program whose dependence on imports has been steadily increasing. In 1973-74, 44% of Government operations in wheat (aside from the drawing down of stocks) were from imports, and 68% of imports were on concessional terms. This means that 30% of Government wheat distribution was from foreign assistance sources. If the proportions are the same for the ration system, then 30% of its distribution represents food aid. In 1974-75, this would have amounted to 371,775 tons of wheat.

If food aid were eliminated, the Government would have several options. It could elect simply to reduce the size of the program by reducing the ration. Judging by the Government's response to the high wheat prices of 1974-75, this seems relatively unlikely. If such a policy were adopted, the ration would in fact, have be cut by more

than 30%, since certain other Government responsibilities, such as military and institutional feeding, might have to be maintained at their current level. A second option would be to make up the difference by means of purchases from domestic suppliers. This would mean raising 1974-75 procurement by 371,000 tons, or about a third for the ration system alone, raising the proportion of output procured to 23.4%. Of course, the specific proportions would depend on the supply situation, which varies from year to year. The cost of domestic procurement would be less than the cost on paper of the imports, and it would have the advantage of being payable in local currency. However, the procurement price would probably have to be raised in order to call forth these larger supplies, unless compulsory procurement were implemented. Even if procurement were compulsory, higher prices might be necessary in order to avoid a production disincentive. Furthermore, reduced supplies of domestic wheat on the open market would result in higher prices to the non-ration shop customer. This is not necessarily undesirable. If consumption by the needy is primarily through ration shops, then, in effect, the relatively better-off consumers, purchasing on the open market, would be further subsidizing, by the higher prices they pay, the ration shop purchases of the low income population. At the same time, however, the higher open market price might drive some consumers to the ration shop for their supplies, thereby enlarging the demand through the ration system.

A third option would be for the Government to make up for lost foreign aid by means of commercial purchases on the world market. At February 1976 world prices (about $150 per ton), the quantity of wheat lost to the ration system by the elimination of food aid would cost $55.8 million, or about 3% of total imports by value in 1974-75. Once again, the Government would have to spend more in order to maintain its other distribution programs as well. If world market prices reached the levels of 1974, when wheat sold at $210 per ton, the cost would increase to $78.1 million. As was the case in the earlier reduction of food aid, it is likely that the Government would respond to further aid cutbacks in the forseeable future by increasing its international commercial purchases more than domestic purchases, and probably would not cut back its programs. Pakistan suffers from a shortage of foreign exchange; it has been a net importer for many years. It is, however, a nation which enjoys reasonably good international credit because of the economic progress it has achieved In addition, as traditional sources of loans have diminished, Pakistan has been able to turn to the newly-rich oil-exporting countries of the Middle East for assistance as a member of the Islamic League. In 1974-5, 51.4% of all foreign aid, a total of $896.1 million, came from Islamic nations. In the same year, 50.5% of foreign aid went for commodity imports and balance of payments support.[50] At least in the short run then Pakistan is in a fortunate position in terms of having access to funds to carry out its food assistance programs.

Ration System Program Alternatives: Costs and Benefits

If the Government decided to increase the benefits provided by the ration program, it could do so either by raising the size of the ration, or by lowering its price, or both. If the size of the ration were raised, with no change in price, presumably those who are already purchasing less than the quota would continue to purchase the same quantity as before. Since we have no empirical information about individual household consumption of ration atta, we shall assume that the proportion of consumers in each income class who now purchase the ration would increase their purchases if they could do so. Since this proportion is smaller for higher income classes, a relatively smaller proportion of the marginal benefit of the increase in quota size would go to the non-target group. Those who are now purchasing the allowable limit of ration atta and who supplement it from the open market could increase their total consumption of atta without raising their expenditure, by diverting their purchases to the ration shop. The nutritional benefit to this group would be proportional to the increase in intake resulting from the switch to ration atta, an amount equal to the proportional difference in price between ration and open market atta, multiplied by the amount of the quota increase. However, those households which presently purchase only ration atta, and which in some cases cannot even purchase their entire allotment because of limited resources, would not benefit at all from an increase in the ration, although they are the neediest consumers, because they

could not afford to purchase the entire ration. There are no data available which would enable us to estimate the number of households which fall into this group, but given that the bottom 3% of the population appears, based on our earlier calculations, to derive less than the maximum benefit from the ration atta, we will assume that this group could not purchase an increased quantity without a price reduction.

Based on these assumptions, we have derived an estimate of the increase in consumption which would result from raising the atta allotment by one kilogram per person per month. Assuming again that 30% of Pakistan's population is urban, we calculated the number of individuals in each income class, and the number who purchases ration atta based on the participation data used earlier, and then calculated the number of minors (40%) who receive half rations. Based on these calculations, an increase in the quota to 8.5 kg. per person per month would result in an increase in total distribution of 108,774 tons per year, 8.8% higher than the amount consumed in 1974-5. If this quantity of wheat were obtained from imports, the cost at present (1976) world prices would be $16.3 million. If the issue price remained at Rs. 35 per maund, the total cost to the Government would be $6.0 million. However, the expenditure of $16.3 million would be in foreign exchange, while the return would be in local currency. If the wheat were procured domestically, and

if the amount of Government subsidy remained at Rs. 2.00 per maund, the cost would be Rs. 5,829,243, equivalent to $588,812. In either case, an additional 1.2 million jute bags would be needed at a cost of about Rs. 8 million, or just over $0.8 million. Thus the cost of raising the ration by one kilogram per person per month would be about $7 million(or 5% of the present cost of the atta rationing program)if wheat were imported and $1.4 million,(or about 1% of the program's cost)if domestic wheat were used.

We have defined the target group here, for nutritional purposes, as those households with income below Rs. 250. The number of persons in the target group benefitting from an increase in the atta allotment would be all those participants with household incomes between Rs. 100 and Rs. 250, or 6.8 million persons. The nutritional benefit received would be (by our earlier assumptions) one third of the value of the additional kilogram, or 34 additional calories and 1.2 additional grams of protein per day. The monetary benefit would be one third of the cost of a kilogram of atta on the open market, or Rs. 0.4 per month. If the size of ration were lowered by one kilogram, we may assume that all but the poorest 3% of the population who purchase ration atta would reduce their consumption by that amount. This would mean a reduction in consumption equivalent to the increase discussed above of 108,774 tons per year, and the cost reduction would be equivalent to the increase in costs discussed above.

If the price of the ration were lowered, with no change in the allotment, then the small percentage of people who are presently unable to purchase their entire allotment would certainly receive a nutritional supplement, since this group has a high price elasticity of demand for atta, and would take advantage of the lower price to increase the quantity purchased up to the maximum allowed. It is expected that this group is small since even the second lowest income group (Rs. 50-99) reported spending Rs. 16.00 per month on wheat flour in 1971-72, an amount sufficient to cover the atta ration for a family averaging 2.6 members, with an average of 40% of its members being minors. More realistically, a family of three with one child would be entitled to purchase 18.75 kg of atta per month, at a cost of Rs. 17.81. It should be remembered that, with inflation, the household reporting these purchases in 1971-72 should have increased its money income by 82%, so that presumably the total expenditure on wheat and wheat flour has also increased. Lowering the price of the ration would provide a real income supplement to all ration shop users in proportion to the amount of atta they purchase. As indicated earlier the nutritional benefit of the income supplment would be greatest in the lowest income classes. However, a certain amount of "leakage," that is, expenditure on non-food items or on increases in quality rather than quantity would be expected with an income supplement which would not occur if the supplement were in the form of food. Furthermore, a lower price would enable only those who were presently purchasing

less than their allotment to increase their purchases of ration atta. All others would have to turn to the open market and pay higher prices for the atta they consumed.

In order to lower the retail price of ration atta by Rs. 0.10 per kg., the Government would have to lower the issue price to the mills by the same amount, that is, by Rs. 4.00 per maund. The cost of all wheat to the Government, imported and domestic, would go up by this amount, raising the total cost of wheat distributed by $13.4 million, or an additional ten percent of the cost of wheat for the program in 1974-5 (one percent of the Government's annual operating budget). In addition, perhaps three percent of the population might increase their purchase of atta up to the limit. If the entire urban population with incomes under Rs. 100 now participating in the ration program purchased an additional one kilogram of atta per month, with minors purchasing half a kilogram, the increase in total distribution would be 4675 tons per year, less than 0.4% of the amount distributed in 1974-5, adding a negligible amount to the total cost of the program. Raising the retail price of the atta by raising the issue price would, presumably, lower Government costs to a comparable extent. The relative advantages and disadvantages of the two options would depend on the characteristics of the consumer population. If the percentage of consumers who cannot afford the whole ration is high, it might be advisable to lower the price, although the leakages would be high. Increasing the size of the ration would provide minimal benefit increases to the wealthy

but it probably would not benefit the poorest consumers either. Empirical evidence would be needed to determine which alteration would be preferable.

There are several other possibilities for increasing the nutritional contribution of the ration system. One such option is to expand the variety of foods available through the system at controlled prices, being careful to select foods which meet the criteria outlined earlier in this report. A food which is probably even more appropriate than atta for subsidized distribution is gram, or chick-pea, which is consumed in Pakistan in declining amounts with rising income. McCarthy[51] holds that gram is more suitable to a price subsidy than wheat, since a disporportional amount is consumed by the low-income (under Rs. 250) group, and the price elasticity of demand (expenditure) by this group is higher than for wheat (1.95, compared with 1.6 for wheat). The potential nutritional contribution of gram is significant, since gram is a pulse, which contains protein complementary to that of wheat and other grains. This means that if gram is consumed with wheat, the value of the protein in both foods is enhanced.*

Another food which might be distributed through the ration system, either free or at a subsidized price, is a weaning food: a high protein and high calorie beverage or gruel designed to meet the nutritional needs of young children during the critical weaning period, usually falling between the ages of 6 and 24 months. Similar foods donated by international aid agencies have been distributed in Pakistan

* Foods which meet other criteria for subsidization but are not nutritionally valuable often can be fortified, with the benefits of fortification going exclusively or primarily to ration shop users. The Government of Pakistan is presently considering the fortification of flour mill atta with vitamins and minerals.

through the maternal-child health system, and have had varying levels of acceptance. The Government of Pakistan is presently seeking to develop its own weaning food, manufactured domestically from locally grown commodities. The advantage of using ration shops for weaning food distribution is that, at least in urban areas, the ration system reaches a far higher proportion of the population than do the health centers. Even in rural areas, the majority of the population purchases sugar at ration shops, while only a small proportion visits the health centers, and then only irregularly. Therefore it may be expected that a weaning food handled by the ration system would be much more widely available than is the case at present. The raw materials, processing and packaging (if any) of such a weaning food should be designed to meet the criteria, discussed earlier, for any food which is a candidate for subsidized distribution.

One final possibility for expanding the nutritional impact of the ration program would be to extend atta distribution to the entire country. Apart from availability, logistical and cost considerations, distribution in rural areas is thought unnecessary by some on the assumption that farmers who produce their own wheat keep what they need for household consumption before marketing the rest. Many observers believe, however, that some small farmers do not produce enough to fulfill the household's consumption needs

but still must have a marketable surplus to obtain cash to pay off debts and pay for other needs. It is said that some farmers must commit themselves to sales at below-market prices early in the season in order to obtain credit for seeds and other inputs. These farmers must buy grain at the higher prices which obtain later in the year, because they could not retain sufficient grain from their own production. Furthermore, landless agricultural laborers who receive inadequate food as wages in kind are dependent on the open market for any additional food they may be able to afford. On these grounds a case could be made for extending subsidized atta distribution into rural areas.

It appears unlikely, however, that the ration system would be expanded in this manner. The cost would be exceedingly high, since 70% of the population lives in the countryside. The system would have to operate differently, since it would be unnecessarily costly to ship wheat to the cities for milling and then back again. Flour mill atta is relatively unknown outside urban areas. At the same time, wheat is not as much of an inferior good among the rural population; its consumption does not decline with increasing income as much as in the cities. Therefore, targeting would probably be less effective. Most importantly, many of the reasons for the establishment of the ration shops relate primarily or entirely to the urban population: implicit subsidy to industry through price control of the key wage good, and

stabilization of the politically active masses. It is reasonable to assume that the ration system for atta will continue to be confined, with only a few exceptions, to urban areas.

SUMMARY AND CONCLUSIONS

Government intervention in agricultural prices traditionally has been designed to affect farm production and farmer income, with little attention being paid to the effects of these prices on food consumption. High prices, which are considered desirable because of their incentive effect on agricultural production, often have at least a short-run negative impact on food consumption, particularly in the developing nations where incomes are low and the price elasticity of demand for food is high. A system of government subsidies on the consumer prices of foods can reduce the conflict between the objectives of increased production and of adequate food consumption, by making up the difference between administered producer and consumer prices. A number of low-income countries have implemented such systems, usually for some combination of the following reasons: 1) to distribute food equitably in a shortage; 2) to minimize social disruption in the cities, often a function of rising food prices; 3) to stimulate investment in the industrial sector by keeping down the price of the key wage good; 4) to ensure that the needy can purchase an adequate diet. The primary motivation for establishing food consumption subsidies has not been nutritional improvement or income redistribution, yet under some circumstances these functions can be well served by such programs.

Consumer price subsidies have been critized for their association with the maintenance of low producer prices through government restrictions

or bans on exports or through compulsory procurement at low, administered prices. We have argued in this paper that the policies which lead to low prices are not necessarily integral to a program of consumer subsidies, but frequently exist for reasons which are independent of these programs. Other commonly heard criticisms of consumer price subsidies are that they are quite costly, both financially and in terms of administrative talent, and that the benefit of the subsidies goes largely to the non-needy population. We have proposed four conditions under which we believe that subsidized consumption programs can partially circumvent these difficulties. They are as follows: 1) The program must be able to alter the absolute price level of the subsidized commodity, so that it can respond to general inflation and keep its costs at an acceptable level: 2) The amount of the subsidized commodity which can be purchased must be limited, to prevent demand, stimulated by the artificially low price, from far exceeding supply: 3) The benefits of the program should be targeted as much as possible to the needy; in the paper we argue that this targeting is best achieved by selecting for subsidy, commodities of low quality and prestige value (but not low nutritional value) which the non-needy will, in general, choose not to buy. We believe that administration of a means test in a low income country is usually a cumbersome, costly and easily circumvented method of targeting. 4) The program should not monopolize trade in the subsidized commodity. If a parallel free market exists, then producers who sell a portion

of their output to the government at less than optimal prices can make up such losses by raising the price of the remainder to be sold on the open market. Since the open market, with its higher prices, is likely to be patronized by higher income groups with a low price elasticity of demand for food, negative nutritional consequences of these prices are unlikely.

An additional criticism of subsidized consumption programs, usually leveled by nutritionists rather than by economists, is that the benefits of such programs are usually limited to urban areas. To argue against the program on these grounds, however, is to forget that the primary purposes for establishing such a system have not been nutritional, but rather political and economic, and these purposes relate primarily to the urban population. It should also be noted that in Pakistan, as in most low-income countries, the highest proporition of severe malnutrition is found in urban slums. This is not to argue against programs in the countryside, but rather to say that opposition to subsidized consumption systems on the grounds of urban-rural disparity may be a classic manifestation of the perfect as an enemy of the good.

An additional argument in favor of consumer price subsidies is their political viability. They are popular and highly visible, and accordingly are difficult to dismantle once they have been implemented (an advantage or disadvantage depending on one's perspective). They are not viewed as direct income transfers, and in cases where no

means test is applied, they are perceived as benefitting the entire population, not only the poor. Therefore, there is not likely to be major resistance to their initiation. Furthermore, these programs serve a number of objectives other than nutritional ones, which gives them considerably greater strength than most programs which are designed for welfare purposes alone. Clearly, political acceptability is vital in judging the potential effectiveness of any social program.

The ration shop system in Pakistan is a subsidized consumption program which fulfills the four conditions we have outlined above. In this paper, we have described the operation of the program and analyzed its nutritional and economic impact, its cost, the extent of its dependence on foreign food aid, and the costs and benefits of possible program alterations. We find that the cost of the program has been regulated by altering the retail price of the commodity; that in 1974-5, program costs were about 10.8% of the national operating budget; and that as foreign food aid has declined, Pakistan has turned to the international market for its wheat, assisted by financial aid from other Islamic nations. We conclude that the targeting of benefits is relatively effective, and that the program as it now exist has significant nutritional and income redistributional effects, providing a supplement of 8.6% of calorie and 24% of protein recommended intakes,* and an income increment of almost nine percent

* The standards used are WHO recommended intakes for an adult male of moderate physical activity, relatively liberal standards which may somewhat underestimate the supplementation. If FAO regional requirement estimates were used instead, the caloric contribution would be 14.25% of requirements to this group (see footnote p.33)

in the second lowest (Rs. 50-99) income class.* The reader should be aware, as we are, that our analysis is based on information collected in only two cities: Karachi and Lahore, which may not be representative of urban Pakistan. In order to use these data, we also have had to make a number of assumptions, the validity of which have yet to be tested. Accordingly, our conclusions should be viewed as tentative, and further empirical research must be carried out before we can calculate with precision the effects of the program.

In light of Pakistan's experience, it appears that subsidized consumption programs, operated under the conditions we have outlined, can be of value in redistributing income and in supplementing the dietary intake of low income groups. Nutritional status will be improved to the extent that income is the factor most seriously limiting adequate food intake. Clearly, price subsidies cannot, by themselves, educate, or influence consumer behavior or patterns of intra-family food distribution. The effectiveness of these programs in improving nutritional status could be increased, however, by expanding the range of subsidized commodities available and, quite possibly, by introducing foods for specific target groups, such as weaning foods for young children under the age of two. We believe that the concept of consumer food price subsidies has important implications for nutritional well being, and that it deserves further study from this perspective to determine under what circumstances and in what form the effectiveness can be maximized.

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* This is the additional food and real income generated by the Government intervention (the food subsidy) and not the nutritional and income value of the ration.

Appendix

A. Administrative Structure of the Ration System

The Food Department, headed by the Director of Food, is the responsible agency for the rationing system at the provincial level. The provincial Food Director establishes specific regulations governing the relationship between procurement and storage centers, mills, ration shops, and card holders, including the manner in which purchasers are assigned to specific suppliers. The Food Department also regulates the movement of grain between surplus and deficit districts within the province. Each province is divided into regions, which have a Deputy Director, Food and an Assistant Food Director administering the rationing program. These officials are responsible for procurement, quality control, storage, and issuance of wheat from Provincial Reserve Centers (storage depots) to flour mills.* Both Sind and Punjab are divided into two regions. The administrative level below region is the district. There are 19 districts in Punjab, and ten in Sind. Each district is headed by a District Food Controller. The district Food Controller's staff of Food Inspectors and Food Grain Supervisors operates at the tehsil level to make cash purchases of wheat from farmers and grain merchants. The DFC can authorize additional representatives to purchase grain if necessary. The DFC also makes

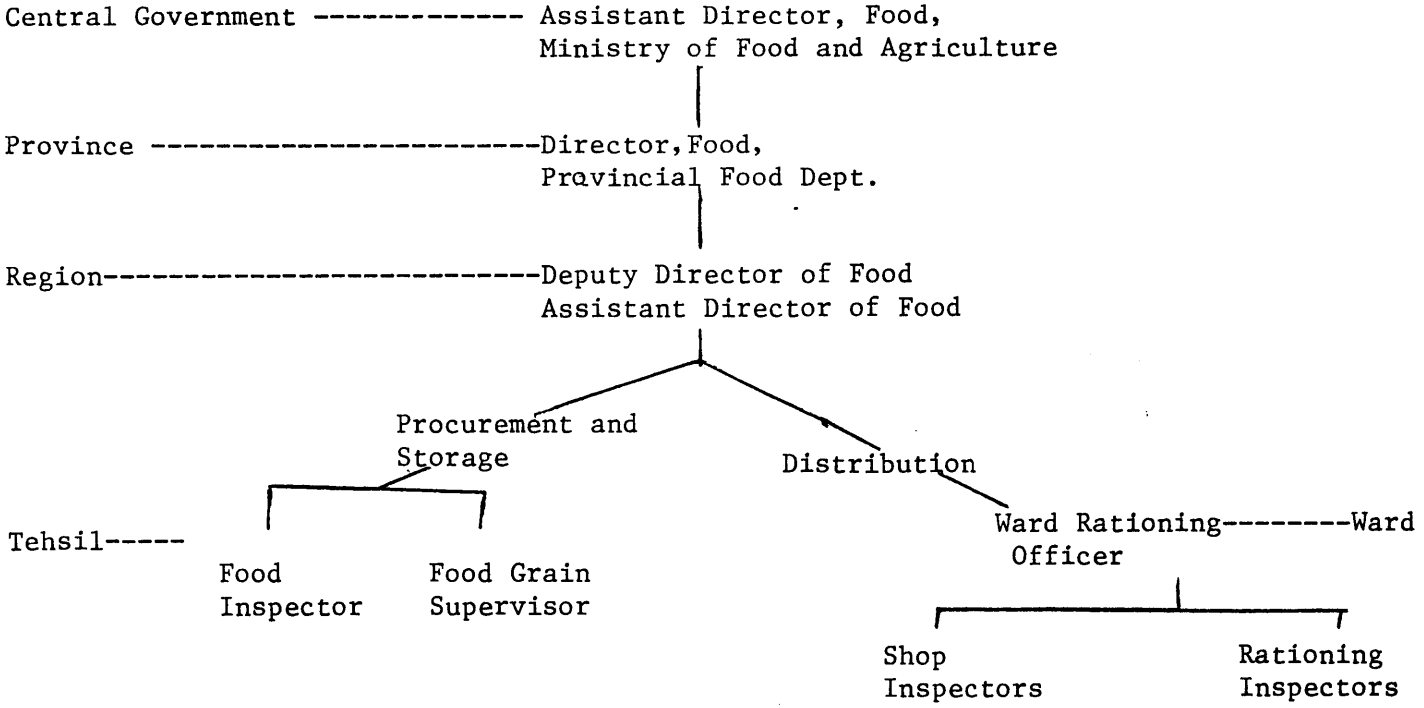
* In Karachi region, procurement does not take place, since wheat is supplied from imports.

decisions as to where and how grain shall be stored, whether in bulk or in bags, and the type of godown (warehouse) to be used.

The District Food Controller in the larger cities, and, under his supervision, the Ward Rationing Officers in smaller areas, receive applications for ration cards from households and issue the cards. Licenses to operate a ration shop are also issued at the District level. The DFC keeps up-to-date recrods of the number of ration shops currently operating, the number of ration cards (households) and units (individuals) associated with each shop, and the quantity of atta and sugar distributed each week and fortnight. Adjustments in the quantity authorized to be issued to each shop are made on the basis of fluctuations in the size of the registered population and in quantities of the commodities distributed from week to week. That is, if part of a week's quota is not purchased, that quantity is subtracted from the next week's allotment. Below the district level, Rationing Inspectors (three to four per ward) and Shop Inspectors (one to three per ward) work with the Ward Rationing Officer, examining the records of the ration depot owners and inspecting the depots.

Fig. I presents a table of organization of the rationing system.

Figure 1
Table of Organization:
Pakistan Ration System



B. Logistics of Domestic Procurement of Wheat

During the harvest season from May to September, purchase centers are established at central points throughout each province. In Sind, there were 200 purchase centers in 1973-4, and in Punjab, there were 634. Sales may be made to the Government agents directly by the growers or by grain merchants acting as brokers. It is the policy of the government to encourage direct sales by farmers. To this end, local officials are posted at each local market to provide information to growers. The minimum sale to the Government is five bags, to allow small farmers to enter the market. Gunny bags in which to deliver wheat are supplied free to farmers making direct sales to the Government; other sellers must leave a refundable deposit of Rs. 9.00 per bag. Bags must be returned, filled, within seven days of issue, and an account of the bags is kept at each purchase center. The cost of transporting wheat to the purchase center is borne by the seller, but temporary purchase centers may be set up close to growing areas if a given minimum quantity is available, in order to facilitate sales. Growers who sell directly to the Government are paid the full price of the grain on the spot. Other sellers are paid 97% of the price, the remainder subject to deductions for substandard quality, to be determined after laboratory analysis of a sample of the wheat. Grain brokers are entitled to additional charges for delivering grain to Government warehouses or to railheads. These charges range from Rs. 0.10 per maund for delivery at the railway

platform, to Rs. 0.19 per maund for delivery in Government bulk storage bins.

The Food Department will purchase as much wheat as is voluntarily offered for sale at the support price. Each district has a quota which it must try to meet, but according to one food official in Punjab, the quota is usually not met. During the 1970's the Government support price of wheat has been below the open market price. This is one reason that sufficient supplies are not forthcoming from farmers. Another explanation was given by an agricultural economist from Sind[52] who said that small farmers and tenants must often commit themselves at the beginning of the season to selling their crop at below the Government support price in order to obtain credit, seeds, and other inputs from the landlord or moneylender, and therefore they cannot take advantage of the Government price guarantee.

C. Division of Domestic and Imported Supplies of Wheat

Punjab supplies grain for its own ration shop system, that of the Northwest Frontier Province, and for Azad Kashmir and the army. From May until about November, the mills in Punjab are supposed to receive almost entirely, domestic wheat to mill into atta. For the remainder of the year, imported wheat is to be supplied at a ratio of 50:50 with domestic wheat. However, when domestic supplies are not sufficient, 100% imported wheat is supplied to the mills. Table AI which shows the quantities of imported and domestic wheat consumed in Lahore city in

the twelve months of Fiscal 1972-3, indicates that there may not be sufficient domestic wheat for the whole province, even during much of the harvest season. During the year, only 23% of the wheat consumed was from doemstic supplies, while 77% was imported. In Sind, the supply of domestic wheat is smaller, and is kept within the province. Domestic wheat is generally sent to areas of Sind other than Karachi, because of higher transportation costs and the ready availability of imported supplies in that city. Ration shop atta is supposed to contain at least 25% domestic wheat, but often such supplies are not available, and all imported wheat must be used. Table A-II shows the relative distribution of domestically produced wheat to Karachi and to the rest of Sind from 1970 to 1974. Karachi consistently receives a half or less of the supply, although its population is larger than that of all other towns in the province combined. Information on wheat supply and procurement in Baluchistan and NWFP were not obtained. Both are wheat deficit areas, although it is said that NWFP produces sufficient wheat for its population, but exports it illegally to the Middle East through Afghanistan, reducing available supplies. Careful study of acreages and production figures for NWFP might give some indication whether or not this is true.

Table AI: Imported and Domestic Wheat Consumption, Lahore City [a]

Month/Year	Quantity Consumed (1000 maunds) Imported	Domestic	Total
July 1972	79	15	94
August 1972	148	8	1156
September 1972	200	33	233
October 1972	126	45	171
November 1972	211	33	564
January 1973	644	0.5	644.5
February 1973	500	0	500
March 1973	935	44	979
April 1973	147	158	305
May 1973	15	420	435
June 1973	123	334	457
Total	3670	1112.5	4782.5

a. Source: MICAS Associates, Ltd., Roti: Appendices to the Feasibility Study, report prepared for the Government of Pakistan, Karachi, 1974

Table A-II: Domestic Wheat Issued to Sind (in tons) [a]

Year	Procurement	Issue to Karachi	to Other Towns
1970-71	186,521	71,201	115,320
1971-72	188,190	81,692	106,498
1972-73	83,632	40,692	42,940
1973-74	212,305	56,396	155,909

a. Source: Micas Associates, Ltd, opcit.

D. Milling of Flour

There are 170 roller flour mills in Pakistan, of which 118 mill atta for the Government.[53] All atta for the ration system is ground in roller mills. Table AIII shows the breakdown by province of these mills.

Table A-III Distribution of Roller Flour Mills by Province[a]

	Punjab	Sind	NWFP	Baluchistan
Total Mills	98	50	17	5
Gov't Mills	58	38	17	5

a. Source: Pakistan Flour Millers Association. Lahore, 1975

Until October, 1974, mills which operated for the Government were allowed a certain number of hours per day or days per week when they could mill wheat on their own account. In addition, they were allowed a percentage of Government-supplied wheat as a commission, and were permitted to extract a given proportion of bran and fines from Government wheat which they could sell privately, before milling ration atta. The specific regulations as to percent of bran and fines to be removed varied from time to time and from province to province, depending in part on the supply situation. Under present law, every mill which produces ration atta must operate entirely on Government account. It must product 100% whole-meal atta, with no extractions. Officers of the Food Department are stationed at every flour mill. They are responsible for issuing atta to ration depot owners, and for keeping records of

the quantity of wheat received and milled and of atta issued by the mill. They also monitor the quality of atta produced.

Mills purchase wheat at a Government-subsidized price, which was Rs. 21.50 per maund in 1974-75. They are required to pay the cost of transport from the government godown to the mill and the cost of unloading the bags. Transport costs are about Rs. 1.00 per bag (Rs. 0.40 per maund), and unloading charges are Rs. 0.10 per bag (Rs. 0.04 per maund), so the total cost to the mill of a maund of wheat was Rs. 21.94. Before October 1974, mills were allowed to charge Rs. 1.15 per maund for milling, allowing a profit margin after transport cost of Rs. 0.71. They also profited from the private sale of maida* and bran extracted from the atta, and from the percentage of wheat allowed as commission. Now that Government mills must process all the wheat supplied into 100% whole meal atta, they are allowed a profit margin of Rs. 1.99 on the selling price.

Mills are frequently alleged to engage in certain abuses and malpractices regarding the processing of ration atta.[54] They are said to extract a higher percentage of fines and less bran than allowed in the regulations. Since no extraction is now permitted, this situation may no longer obtain, although it would still be possible for mills illegally to extract fines. Other abuses of which mills are accused include: 1) mixing cheap, spoiled wheat, other grains, ground stale chapatis, and even sawdust in with the wheat before grinding;

* white flour

2) dampening the gunny bags or the atta itself in order to add weight; 3) substituting old gunny bags for the new ones supplied by the government. Although these practices are popularly discussed, there was no evidence of them at the mill visited in the course of this study or in the ration shops, where the quality of atta seemed to be good, based on appearance, smell and feel. Nonetheless, the belief that they occur influences the behavior of consumers.

E. Ration Shop Management

a) Owner Eligibility

In order to operate a ration depot, the prospective owner must apply to the District Food Controller stating his name and parentage, his occupation, how long he has been trading in rationed foodstuffs, the annual volume of his business, other authorizations held or applied for, and the location and particulars of the proposed shop. The applicant must also list relatives in the Food Department. According to the regulations, applicants with relatives in the Food Department are not permitted to own ration shops, although it is said that this rule is not observed. The distribution of shops in an area is supposed to be determined by the density of the user population. A shop serves an average of 3,000 individuals, and is not permitted to serve more than 6,000. If the registered population of a shop approaches the upper limit, an additional shop is authorized in the neighborhood, and the user population divided between the two. Some individuals have stated that in fact, the ration system is operated by the Pakistan People's Party,

and that the granting and withdrawal of licenses is made on the basis of service and demonstrated loyalty to the Party. If the shops are nonetheless distributed evenly throughout the areas served, and if they are operated according to regulations, it is not clear that the granting of licenses based on patronage would necessarily prevent the benefits of the program from reaching the population.

b) Purchase of Ration Supplies

Ration shop owners are authorized to purchase a given amount of atta every week, and of sugar every fortnight. The authorization is issued weekly (for atta), or fortnightly (for sugar) by the District Food Controller's office, based on the number of users registered with the shop for that time period, with deductions for quantities left unsold at the end of the previous period. In order to make a purchase, the owner first deposits the exact amount to pay for the authorized quantity in a branch of the state bank, and receives a voucher, called a challan, which he then takes to the mill to exchange for atta, or to the government godown for sugar. Food Department employees at the mill or the warehouse keep records of the quantities and recipients of commodities disbursed. The transaction takes place a few days before the time when these goods are to be distributed. Shop owners must pay for transportation and loading of their supplies. According to several shop owners in Karachi and Lahore, the supply of atta and sugar is reliable. Occasionally, they say, they must use not the nearest godown, but one slightly farther away. This raises

transport costs, according to one shopkeeper in Karachi, from Rs. 1.00 to Rs. 1.25 per bag. It was generally agreed that almost never were supplies unavailable. However, it should also be remembered that not only are Lahore and Karachi the two largest cities in the country, and therefore likely to have reliable channels of distribution, but also they are in wheat surplus areas where supply would not be expected to be a problem. Shop owners in NWFP and Baluchistan should be interviewed to determine the supply situation in these remote areas.

c) Record Keeping

Shop owners keep detailed records of every transaction involving rationed commodities.* In a ledger is recorded the card number, the date, and the quantity of each item purchased in each transaction. The shop owner also indicates in the customer's ration book how much of his allotment for that period has been purchased. Then the customer obtains a receipt for payment, which he exchanges for his purchases. A separate ledger lists the current size of the registered user population, broken down by the number of households, individuals, adults, and minors authorized to use the shop. This list is based on changes in the ration population recorded in the office of the District Food Controller. The shop's records are supposed to be checked regularly by a Rationing Inspector or a shop Inspector. Some shop owners showed the writer the places where an inspector had reviewed and signed the ledger. Others said that the inspectors knew

* In Sind, ration shops are permitted to sell non-rationed goods as well as ration atta and sugar. In Punjab, only rationed commodities may be sold.

them personally and did not bother to check their records. In every case in which a shop was visited, however, shop owners had their ledgers out and were recording transactions, and customers were routinely handing over their ration books. Ration shop visits were not planned in advance, so it may be inferred that keeping these records is standard procedure. The accuracy with which they are kept could not be verified.

d) Economics of ration shop operation

At the present time (September, 1975) a ration shop owner can buy a bag of atta weighing 2½ maunds (about 200 pounds) for Rs. 80.00 (including bag), and a 2½ maund bag of sugar for Rs. 220.00. The shop owner must also pay the cost of loading and transport from the government godown to his shop, which is between Rs. 1.00 and 1.25 per bag for atta. The transport cost may be somewhat less for sugar, which is less bulky. The profit allowed on a bag of sugar is one rupee; on a bag of atta, it is Rs. 1.25. In addition, the shop owner sells the jute bags in which the atta is supplied, and the cotton bags from the sugar. Jute bags sell for Rs. 4.00 to 7.00, and cotton bags for Rs. 2.50 to 6.00. Since the profit margin on the sale of rationed commodities is largely taken up by transport costs, the shop keeper's income derives primarily from the sale of the bags. The size of the shopkeeper's income depends on the quantity of sugar and atta which he sells. One ration shop owner in a low income neighborhood of Karachi (New Karachi) had a registered population of 6,000 individuals (the maximum

permitted). He reported that his customers purchase all that they are entitled to, and that he received 58 bags of sugar every fortnight, and 100 bags of atta every week. Assuming an average price of Rs. 4.00 per bag, which is probably on the low side, this owner could sell about 516 bags per month, for a gross income of roughly Rs. 2064. Out of this, he must pay for rent and electricity in his shop, and the salary of his assistant, who weighs and distributes commodities to the customers. This shop owner estimated his net income at Rs. 1500 per month, in the 99th percentile of household incomes. Shop owners with a smaller registered user population would of course have lower incomes.

Ration shop owners may also engage illegally in black market sales of sugar and open market sales of the ration atta. Sugar is reported to sell for Rs. 8.00 to 10.00 per kg. on the black market, compared with Rs. 4.00 per kg. in urban ration shops. The ration price of atta is Rs. 37.00 per maund, compared with about Rs. 48.00 on the open market. Of course it was not possible to determine directly the extent of black market and illegal sales. In the ration shops visited, customers did not appear concerned that supplies might run out: there were no long lines or jostling for a better position. It must be remembered, however, that ration shops were visited only in Lahore and Karachi, during the very end of the harvest season. In the village of Kot-na-Jibullah in NWFP, no ration shops were visited, but residents reported that when a shipment arrived, there were long lines at the shops, and that people lost time from work in order to obtain their allotment before the supplies were exhausted. Similarly, in the Telephone Colony

of Haripur, consumers said they lost time from work waiting in line at the ration shop.

This might be due to supplies being diverted, or simply to their being less readily available in an area rather distant from the source of supply. One shop owner admitted that when a customer did not claim his entire allotment of atta for a week, he would record a sale anyway and sell it to a needy person who required extra, or to a poor migrant who had no ration card. No ration shop keeper reported customers failing to purchase their sugar quota. However, the Household Income and Expenditure Survey of 1971-2 reported lower per capita consumption of sugar among the majority of the urban and rural population than would be the case if all consumers used their full allotment. The possibility exists that some proportion of sugar supplies is not purchased, either because the consumer cannot afford his whole quota, or because it is not available, and that this quantity may be diverted to the black market. Some shopkeepers may also obtain extra sugar through bogus cards, or other means.

e) Program coverage, shop location and hours of operation

The ration shop system operates primarily in urban areas. The rationale for this is that in rural areas, the population has access to land on which to grow wheat, and so has less need of the program. A more likely explanation is that urban areas tend to be politically more active and well organized, and so are better able to make their needs felt and obtain a response on the part of the Government. Rural areas are also supposed to be served by ration shops which distribute sugar

regularly, and wheat during periods of scarcity such as the month before harvest. The density of distribution of these shops varies. In Lahore and Karachi, there are sufficient ration shops to cover the entire population. In Lahore, there are 1258 ration shops for a registered population of 4,200,000 or an average of one shop for every 3,260 individuals. In Karachi, 2,492 shops serve a registered population of 5, 110,000, yielding an average of one shop for every 2050 persons. The shops appeared to be evenly distributed throughout those cities, so that each neighborhood was served by a ration shop close by. It may be that the smaller user population per shop in Karachi is made possible by the fact that shop owners may sell general provisions as well as rationed commodities, and so are not entirely dependent on the size of the registered population for their income. In Kot-na-Jibullah, a village near Haripur, NWFP, statistics on the number of ration shops were not obtained, but people reported problems of long waiting lines and supplies running out, and stated that one ration shop in Hairpur served 14,000 households. This was reported to be a central shop, from which neighboring villages obtained their supplies. Nonetheless, it would appear that this smaller city, further from the source of supply of grain, was less well served by the ration system than the large metropolises. It is worth mentioning that in every town and city visited, every person who was questioned knew where his or her ration shop was and what were its hours of operation.

Statistics on the distribution of shops in rural areas were not readily available. In Sheikhupura District of Punjab, a rich wheat producing area, the District Food Controller reported that there were 1,498 ration shops serving his district's population of 1.6 million. Of these, 102 were urban shops in ten towns, and the rest were rural. This would indicate an average of almost one shop for every thousand individuals. In one village of only one or two hundred people in Sind, about 40 miles from Hyderabad, residents said their ration shop was a few miles away, but indicated that they used it regularly. In the village of Kot-na-Jibullah, residents reported that they had one ration shop to serve the whole population of 13,000. Clearly, the situation varies considerably from one area to another, and systematic collection of figures from a number of regions is necessary for an assessment of the adequacy of distribution of ration shops.

Urban shops are open five days a week, from 7:00 to 10:00 a.m. and from 4:00 to 7:00 p.m. The shops are closed on Thursdays and Sundays. At the shops visited in Lahore and Karachi, there were steady streams of customers during store hours, but no large crowds or long lines. In rural areas, shops are supposed to be open the first ten days of each month, but some consumers in one village reported that the shop simply opens when supplies are received, and closes when they are exhausted. Villages are apparently small enough so that word-of-mouth is sufficient announcement that the shop is open.

F. User Eligibility

Use of the ration shops is not restricted by income. The only criterion for participation is residence (temporary or permanent) in a city or town served by the program. Application for a ration card must be made to the District Food Controller or to a Rationing Officer. The application lists the name, address, and occupation of the head of the household, and the number of adults (over 14), minors (aged two through 14), and children under two in the family. The information must be attested to by a magistrate or party officer before a card can be issued. Once issued, the card is valid until the space to record purchases is used up. Ration "cards" are actually booklets which are good for about three years. Migrant workers and other transients can apply for a temporary ration card which is in the form of a single sheet and is good for only a few months.

It is known that an enormous number of false ration cards are in use. In the city of Karachi, for example, the 1972 census showed a population of 3,469,000, yet in 1974-75, there were 5,110,000 individuals registered on ration cards. Similarly in Lahore, the 1972 census gave a population of 2,148,000, while the ration population in 1975 was 4,200,000.[55*] The abuses resulting in these bogus cards include people claiming more family members than they have, and people registering the same family in more than one place. It is also possible that some shop owners fabricate applications for cards in order to obtain excess supplies of atta and sugar to sell on the open market, although this

* Part of the discrepancy would be explained by the large number of recent migrants in the labor force who leave their families in the village.

practice was not mentioned by people in Pakistan familiar with the program. It was impossible to determine to whom the benefits of the bogus ration cards go, but it may be assumed that people with greater influence are better able to get a bogus ration card approved. This would mean that those with higher income and/or those with a degree of power in the party received disproportionate benefits from the ration shop program. Of course, shop owners also benefit from an increase in the volume of their business.

G. Manner of Purchase

In order to make a purchase at a ration shop, a customer must present his card and state what he wishes to buy. The shop owner records the purchase in the ration book and in his own ledger, receives payment, and issues a receipt which the customer then presents to the shop's assistant, who gives him the commodities he needs. There is no requirement that the whole allotment be purchased at one time, but it must be purchased within the week (for atta) or fortnight (for sugar) or that period's allotment is forfeited. One shop owner reported that he encouraged people to buy their whole ration at once, to save paperwork, and that he occasionally extended credit to customers he knew to enable them to do so. Other shop owners said that they would not sell on credit. Availability of credit may well be one factor determining the extent to which to poorest segments of the population use the ration shops.

The individual making the purchase appeared most frequently to be the male head of the household. A large proportion of purchases were teenage boys, and little boys also made some purchases. Quite a small proportion of purchases were made by females, and those were usually ederly women or little girls. The culture of Pakistan is such that adult women are discouraged from leaving the house to do shopping or other chores. This has implications for the ration system in terms of its potential as a disseminator of nutrition education. The study of grain consumption habits in Karachi and Lahore, mentioned earlier, confirmed that adult females make purchases outside the home very infrequently. Tables A-IV and A-V show the income group breakdown of household members who purchase bread from outside the home. These are likely to be the same individuals who do other shopping as well.

Table A-IV: Family Member Who Purchases Bread (Karachi)[a]

Monthly Household Income	No.	Adult Male	Adult Female	Teenage Male	Child	Servant	Varies	Delivered
<250	81	22%	6%	11%	6%	1%	27%	26%
251-500	133	28%	2%	11%	10%	3%	35%	10%
501-700	82	24%	3%	11%	6%	5%	44%	7%
701-1500	99	19%	-	7%	2%	15%	38%	18%
>1500	76	10%	5%	9%	-	40%	17%	17%

a. Source: Nasir-ud Dean Associates, Roti Report prepared for the government of Pakistan, Karachi, 1974.

Table A-V: Family Member Who Purchases Bread (Lahore)[a]

Monthly Household Income	No.	Adult Male	Adult Female	Tennage Male	Child	Servant	Varies	Delivered
< 250	30	30%	-	20%	17%	-	27%	7%
251-500	72	26%	1%	14%	13%	10%	32%	4%
501-700	46	28%	2%	13%	4%	20%	30%	2%
701-1500	74	22%	-	11%	8%	27%	30%	3%
> 1500	24	25%	4%	13%	-	21%	25%	13%

a. Source: Nasir-ud-Deen Associates, op. cit

H. Quality of Rationed Commodities

Prepared flour is considered an inferior product in Pakistan. People generally prefer to obtain whole wheat and have it ground themselves by a chakki*, so they can be sure that the resulting flour is unadulterated. When prepared flour is purchased, fine white flour (maida) is valued more than whole wheat flour. The atta distributed by ration shops is considered a poorer quality because it is made largely from imported wheat, which produces a bread which is darker in color than that from domestic varieties. Public estimation of ration atta is higher in Lahore, where the flour is more frequently made from locally produced wheat, than in Karachi, where the flour is more frequently made from imported grain. While allegations are frequently made that ration atta is adulterated with ground stale bread and rotten grain, it was the experience of this writer that these charges were made by relatively higher-income individuals who did not themselves consume the flour.

* a small local grinding unit

A number of purchasers at one shop in a low-income area stated that the atta was a little worse in quality, and slightly higher in bran than that on the open market, but that the difference was not great. One shop owner in an upper-class area of Karachi said that he himself used ration atta and found it perfectly acceptable, and that he felt the assumed quality differences were myth. Nonetheless, the myth is widely believed, and has a powerful influence on consumer behavior.

The survey of grain consumers in Karachi and Lahore asked their respondents several questions about their evaluation of various kinds of flour. Their results are presented in the three sets of tables below (Tables A-VII through A-XI). It is clear that ration atta is considered lower in quality than other kinds of flour. Thus the distribution of ration atta automatically targets itself toward low-income consumers.

Table A-VI: Consumer Opinion of Atta by Source (Karachi)[a]

Type of Atta	No. Re-pondents	Very Good	Good	O.K.	Bad	Very Bad
Ration	687	1%	17%	23%	58%	2%
Open Mkt.	268	16%	61%	16%	7%	-
Mix	192	2%	5%	92% *	2%	1%
Self-Ground	310	33%	66%	1%	-	-

a. the source for this and the tables which follow is Nasir-ud-Deen, Roti Report, opcit.

* 87% said ration atta is unacceptable by itself, so they mix in some open market atta.

Table A-VII: Consumer Opinion of Atta by Source (Lahore)

Type of Atta	No. Respondents	Very good	Good	O.K.	Bad	Very Bad
Ration	496	4%	29%	27%	36%	4%
Open Mkt.	360	9%	48%	25%	17%	1%
Mix	11	9%	18%	64%	9%	-
Self-Ground	163	45%	46%	7%	2%	-

Table A-VIII: Good Qualities of Atta by Source (Karachi)

Source of Atta	No. Responses	Good Roti*	White Roti	Good Taste	Soft Roti	Unadulterated	Easily Kneaded	Cheap	Healthy	Better than Ration	Other	No Good Qualities
Ration	687	6%	3%	3%	2%	0	3%	7%	2%	-	1%	77%
Open Mkt.	286	39%	23%	15%	15%	5%	9%	-	4%	4%	2%	29%
Mix	192	19%	2%	3%	2%	1%	3%	-	1%	3%	1%	72%
Self Ground	310	43%	20%	75%	17%	21%	4%	-	7%	3%	4%	14%

Table A-IX: Good Qualities of Atta by Source (Lahore)

Source of Atta	No. Responses	Good Roti	Easily Baked (and kneaded)	White Roti	Soft Roti	Good Taste	Unadulterated	Better than Ration	Other	No Good Qualities
Ration	496	11%	10%	14%	4%	2%	1%	-	2%	65%
Open Mkt.	360	21%	16%	12%	13%	10%	2%	7%	3%	41%
Mix	11	-	27%	-	-	9%	9%	-	-	64%
Self Ground	163	26%	25%	7%	21%	15%	20%	7%	5%	23%

*the most common Pakistani (bread-like) wheat preparation

Table A-X: Bad Qualities of Atta by Source (Karachi)

Source of Atta	No. Responses	Red Color	Adulterated	Inconsistent	Hard Roti	Bad Roti	Unhealthy	Sticky, Rubbery	Bad Taste	Other	No Bad Quality
Ration	687	49%	35%	20%	16%	10%	7%	4%	4%	1%	23%
Open Mkt.	286	6%	9%	5%	4%	3%	2%	3%	0	1%	75%
MIx	192	5%	3%	1%	3%	3%	2%	2%	1%	-	91%
Self-Ground	310	-	2%	2%	0	-	-	-	-	-	95%

Table A-XI: Bad Qualities of Atta by Source (Lahore)

Source of Atta	No. Responses	Inconsistent	Adulterated	Hard Roti	Bad Roti	Bad Smell	Red Color	Un Healthy	Bad Taste	Coarse	Sticky, Rubbery	Other	No Bad Quality
Ration	496	44%	12%	12%	8%	8%	5%	4%	3%	3%	1%	3%	34%
Open Mkt.	360	26%	10%	5%	3%	3%	4%	2%	2%	2%	1%	3%	57%
Mix	11	36%	18%	18%	-	-	-	-	-	-	-	-	45%
Self Ground	163	7%	2%	1%	-	-	-	-	-	-	-	1%	91%

REFERENCES

1. This relationship is presented in detail in Mellor, J.W. "The functions of agricultural prices in economic development," Indian J. Agric. Econ. 23: 23, 1968.

2. Johl, S.S., M.V. George and A.J. Singh. "Agricultural Prices in Punjab -- a policy analysis," Indian J. Agric. Econ. 25: 1, 1970.

3. Mellor, J.W. The economics of agricultural development. Ithaca: Cornell Univ. Pr., 1966.

4. Nicholls, W.H. "The place of agriculture in economic development." In Agriculture in economic development. Eicher and Witts, eds. New York: McGraw Hill, 1964.

5. Nicholls, 1964.

6. Mellor, 1966.

7. Mellor, 1966.

8. Krishna, R. "Agricultural price policy and economic development." In Agricultural development and economic growth. Southworth and Johnston, eds. Ithaca: Cornell Univ. Pr., 1967.

9. Call, D. and F.J. Levinson. "A systematic approach to nutrition intervention programs." In Nutrition, national development and planning. Berg, Scrimshaw and Call, eds. Cambridge: M.I.T. Press, 1973.

10. Johl, George and Singh, 1970.

11. See, for example: Krishna, 1967; "Farm supply responses in India and Pakistan: a case study in the Punjab region." Econ. J. 73: Sept., 1963; Beringer, C. and I. Ahmad "The use of agricultrual surplus commodities for economic development in Pakistan." Monographs in the Economics of Development, # 12. Karachi: Inst. of Development Economics, 1964; Falcon, W.P. and C.H. Gotsch. "Lessons in agricultural development -- Pakistan." In Development Policy J. Cambridge: Harvard Univ. Pr., 1968.

12. Johl, George and Singh, 1970.

13. Krishna, 1967.

14. Hussain, S.M. "Price incentives for the production of high-yielding Mexican varieties of wheat." Pakistan Dev . Rev. 10: 4, 1970.

15. Krishna, R. "The marketable surplus function for a subsistence crop." Ec. Weekly (Bombay) 17: Feb., 1965.

16. Krishna, 1965.

17. Hussain, 1970.

18. Mellor, 1966.

19. Hopper, W.D. "Allocation efficiency in traditional Indian agriculture." J. Farm Econ. 48: Aug., 1965.

20. Schultz, T.W. Transforming traditional agriculture. New Haven: Yale Univ. Pr., 1964.

21. Johl, George and Singh, 1970.

22. Khan, M.I. "Agricultural policy and farm development in Pakistan." Finance and Industry 8: 4, 1969.

23. Government of Pakistan. Pakistan economic survey, 1968-9 and 1969-70.

24. Saleh, A. "Disincentives to agricultural production in developing countries: a policy survey," USDA Foreign Agricultural Service Supplement, March, 1975.

25. Mellor, J.W. "The function of prices in economic development." Indian J. Agric. Econ. 23: Jan.-Mar., 1968.

26. Bergman, T., "Models of price policy in economic growth." Artha - Vikas 6: 1, 1970.

27. McCarthy, D. Nutrition, food and prices in Pakistan. International Nutrition Planning Program Discussion Paper #4. Cambridge: M.I.T., 1975.

28. Krishna, 1965

29. Mellor, 1968b.

30. This concept is elaborated by D. McCarthy in an unpublished mimeo, "Consumption planning in Pakistan: preliminary analysis of some options." International Nutrition Planning Program, M.I.T. Dec., 1975.

31. This concept of the divided wholesale market has been discussed in detail by Dharm Narain in an unpublished mimeo. "The working of a dual market system." Cornell Univ., 1975.

32. Stern, J.J. and W.T. Falcon. Growth and development in Pakistan. Occasional Papers in International Affairs # 23. Harvard Univ., Center for International Affairs. Apr. 1970.

33. Pakistan Yearbook 1960-61. Karachi: Pakistan Publications.

34. Government of Pakistan. Annual Plan 1975-76.

35. In government accounting, import costs of wheat are recorded at market prices whether or not the purchase is on a concessional basis. Loans to pay for wheat are recorded separately, along with other foreign assistance.

36. Government of Pakistan. Ministry of Finance, Planning, and Statistical Division.

37. Nasir-ud-Deen Assoc. Ltd. Household cereal eating habits survey. Prepared for the Government of Pakistan. Karachi, 1974.

38. Figures for 1971-72 and 1972-73 give percentage of total offtake. The other figures are percentages of procurement, the difference being the building up or drawing down of stocks.

39. United States Department of Health, Education and Welfare and Food and Agriculture Organization of the United Nations. Food Composition Table for use in East Asia. December, 1972.

40. World Health Organization. Handbook on human nutritional requirements, WHO Monograph Series. #61. Geneva, 1974.

41. Figures obtained from USAID, Islamabad.

42. Figures obtained from Pakistan economic survey 1971-2.

43. McCarthy, 1975a and from the Government of Pakistan. Annual Plan 1975-76.

44. McCarthy, 1975a.

45. Household Income and Expenditure Survey 1971-2.

46. Reutlinger, S. and M. Selowsky. Undernutrition and poverty: magnitude and target group-oriented policies. International Bank for Reconstruction and Development, Staff Working Paper #202. Revised December, 1975.

47. McCarthy, 1975b.

48. Nasir-ud-Deen Associates, 1974.

49. In Bangla Desh in first quarter, 1975.

50. Economic Intelligence Unit.

51. McCarthy, 1975b.

52. Personal Communication. Mr. Tando Qureshi, Professor of Economics, Agricultural University, Taudo Jam. Sind.

53. Pakistan Four Miller's Association, Lahore, 1975.

54. These malpractices are described in MICAS Associates Ltd. Roti: Appendices to the Feasibility Study prepared for the Government of Pakistan, 1974.

55. MICAS Associates Ltd., Roti: 1975.