

FAMINE AND FOOD POLICY DISCUSSION PAPERS

**DISCUSSION PAPER 3
1990**

WHEAT SUBSIDIES IN SUDAN: POLICY IMPLICATIONS AND FISCAL COSTS

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Results of research work done under the project, "Famine Prevention," at the International Food Policy Research Institute (IFPRI) are reported in these discussion papers. The papers are circulated for discussion. They have not been exposed to IFPRI's comprehensive review process. They, nevertheless, contain valuable and original information and analyses which complement related IFPRI research reports. Support of the research project by the Ministry of Economic Cooperation of the Federal Republic of Germany is gratefully acknowledged.

Joachim von Braun

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WHEAT SUBSIDIES IN SUDAN: POLICY IMPLICATIONS AND FISCAL COSTS

Suleiman A. Shugeiry

INTRODUCTION

The purpose of this paper is to look at wheat subsidies and their distribution system in Sudan and their implications for policies and fiscal costs. The system is complex and it is necessary to understand how it works. Changes in the present wheat subsidy policy are probably necessary, but without a clear understanding of the complexities of the system, one can go in the wrong direction.

The wheat subsidy policy was introduced to alleviate hardships for the people. It was basically designed in recognition of falling real incomes and the need to provide some degree of protection to the public against rising prices. The main drive behind the policy therefore, was to improve the level of general welfare by addressing a wide variety of consumers. Targeting was not deemed necessary because the income level of the majority of the population was low,¹ and bread consumption was confined to the urban population, mostly government employees, workers, and traders. Thus, the wheat subsidy policy was designed in a context different from today's, when urbanization, consumption, and population growth were not real threats.

From the policymaker's point of view, the universal subsidy was seen as fair and justifiable. The subsidy became a problem only when the forces of population, consumption, urbanization, and cheap bread prices, relative to other substitutes, began to present themselves. The government's concern of providing bread at a low price to consumers has created a situation in which bread prices have gradually turned into a political issue. While the government recognizes that conditions have changed and there is a need to, at the least, reduce the subsidy on wheat, politically that is not feasible given the present decline in real incomes. Dependency on foreign aid, modest local production, and foreign exchange constraints create a difficult situation in which choices open to the government are indeed limited. This dilemma calls for a redirection of the wheat subsidy policy.

The intervention in the wheat production and marketing process does not seem to have realized its objectives in terms of welfare. In fact, a situation has developed in which the poor are not the real beneficiaries. Thus, the purpose of intervention, in order to address food insecurity (in the last few years), has not been successful. There is evidence to show that wheat consumption is becoming increasingly an urban phenomenon, but even within the urban sector, the tendency is for the poor to get the least benefits from wheat. This is particularly the case when bread is not freely available at official prices, as in the last few years, for instance. Using wheat subsidies as a mechanism for transferring income to the urban poor is controversial. Wheat may not be the

¹ Income level was low; however, this should be understood as meaning "equal" distribution, because difference in income was there but has not manifested itself in a distinct manner as it is today.

appropriate commodity to prevent real incomes from falling because it has a small share in food consumption. Therefore, in considering alternative policies, the wheat policy framework and its complexity need to be understood prior to any feasible change. This paper represents an attempt to look at the wheat subsidy issue along such lines.

THE WHEAT PROBLEM

Wheat consumption steadily increased at an annual growth rate of 7 percent between 1970/71 - 1985/86 (Fakki and Ismail 1989). The main consumption areas include the Northern Region, Khartoum Province, and major urban centers. This increase in consumption has been attributed mainly to population growth, urbanization, and low wheat prices relative to those of sorghum and other substitutes. During this period, per capita wheat consumption increased from 20.4 kilograms to 31.7 kilograms (Fakki and Ismail 1989). The aggregate figures for per capita consumption do not reflect the very high regional differences. In urban Khartoum, average per capita wheat consumption is well over 100 kilograms compared to almost nothing in some rural areas. Wheat production failed to keep up with consumption: the contribution of local wheat production to consumption declined steadily from 72 percent to 24 percent during the same period, due mainly to fluctuations in both area and yield (Figure 1). As a result, the gap between domestic production and demand increased from 64,000 tons in 1970/71 to nearly 480,000 tons in 1986/87 (Figure 2).

The situation just described has had serious implications for government policy with respect to bread subsidies. The government was able to interfere at different levels of the wheat marketing process through control of wheat imports as well as of part of the domestic production. Such control enabled the government to implement an untargeted bread subsidy policy aiming at provision of low-price bread to consumers. However, 80 percent of the wheat required for sustaining this policy was secured through donor contributions. With the current decline in foreign aid receipts, shortage of hard currency, and the ever widening gap between supply and demand, the government is facing what one may call the wheat dilemma. Experience with domestic production shows that the widening gap between supply and demand cannot be significantly reduced in the very short run. It is equally difficult to continue supporting the policy through donor contributions or to meet such requirements through commercial imports due to foreign exchange difficulties. In such a situation, the wheat subsidy policy becomes increasingly questionable as its original objective of realizing some undefined level of general welfare is turning out to be expensive in terms of fiscal and economic costs.

WHEAT AND WHEAT FLOUR SUPPLY SOURCES

Regulated wheat for purposes of the bread subsidy is secured through domestic and foreign sources (Tables 1 and 2). Although supply sources tend to change from one year to another, traditionally the major sources are domestic production, commercial imports, commodity exchange operations, and grants and aid.

Figure 1—Contribution of local wheat production to consumption

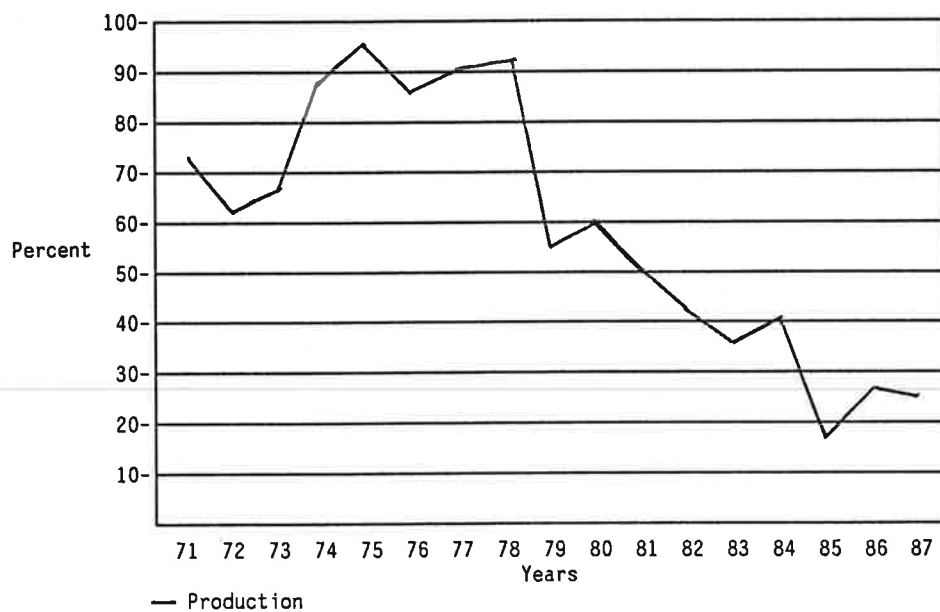


Figure 2—Wheat production and consumption, Sudan, 1970/71 - 1986/87

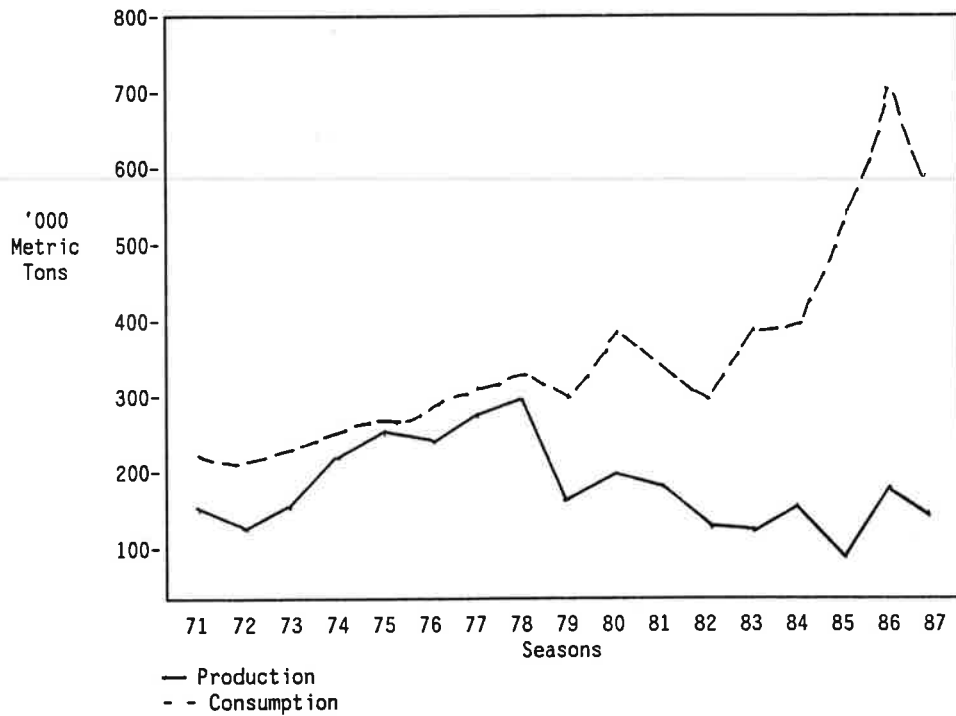


Table 1—Volume and relative contribution of wheat by source of import, 1982-86

Year	Source of Imports				Total
	PL 480	Commercial Imports	Commodity Imports	Grants and Aid	
1982					
Volume ('000 tons)	124	83	127	7	341
Share (percent)	36.4	24.3	36.4	2.0	99.1
1983					
Volume ('000 tons)	121	...	...	12	133
Share (percent)	91.0	...	...	9.0	100.0
1984					
Volume ('000 tons)	231	...	...	11	242
Share (percent)	96.0	...	...	4.0	100.0
1985					
Volume ('000 tons)	364	100	...	26	490
Share (percent)	74.3	20.4	...	5.3	100.0
1986					
Volume ('000 tons)	272	...	...	61	333
Share (percent)	82.0	...	...	18.0	100.0

Source: Food Security Unit, Ministry of Agriculture, Wheat Imports in Sudan (Khartoum, 1989).

Table 2—Volume and relative contribution of wheat flour by source of import, 1982-86

Year	Source of Imports				Total
	PL 480	Commercial Imports	Commodity Imports	Grants and Aid	
1982					
Volume ('000 tons)	21.1	...	44.9	20.0	86.0
Share (percent)	24.5	...	52.2	23.3	100.0
1983					
Volume ('000 tons)	45.7	33.0	...	142.7	221.4
Share (percent)	21.0	14.0	...	65.0	100.0
1984					
Volume ('000 tons)	67.0	...	...	32.2	99.2
Share (percent)	67.5	...	...	32.5	100.0
1985					
Volume ('000 tons)	69.6	22.0	...	23.6	115.2
Share (percent)	60.4	19.1	...	20.5	100.0
1986					
Volume ('000 tons)	73.0	...	...	53.8	126.8
Share (percent)	57.4	...	...	42.3	99.7

Source: Food Security Unit, Ministry of Agriculture, Wheat Imports in Sudan (Khartoum, 1989).

Domestic Production

Wheat is produced in the irrigated sector, mainly in Gezira, New Halfa, White Nile, and in the Northern Province. The marketed surplus, usually from Gezira and, to a lesser extent, from New Halfa and the Northern Region, is regulated through the marketing channels at prices far above those of the regulated wheat under government control. Controlled government schemes, such as the Gezira and New Halfa projects, provide a certain quantity of wheat to the government at fixed prices. The quantities delivered to the grain mills tends to fluctuate from year to year, depending largely on the level of production and attractiveness of declared producer prices. Wheat is delivered to the grain mills at controlled prices, and the difference between producer and mill prices are subsidies borne by the Ministry of Finance and Economic Planning (MFEP). The mills deliver wheat flour to the bakeries at a price set by the government. The contribution of domestic production to the total regulated wheat and wheat flour supply tends to vary from 8 percent to 10 percent.

Commercial Imports

These consist of imports through official channels. The government is expected to supply the required foreign currency to finance wheat and wheat flour imports. Direct purchase is carried out usually by the Red Sea Company, which is responsible for purchasing and transporting the wheat to the mills, according to an agreement between MFEP, the Ministry of Commerce, Cooperation and Supply (MCCS), and the company. The same company is also responsible for delivery of domestic production to the different mills. Depending on availability of foreign exchange, two channels are used:

1. Imports using the official exchange rate: imports through this channel tend to be smaller, due to foreign exchange constraints and difficulty of supplying required amount; and
2. Imports using the free bank rate: the government uses this channel, particularly when imports through the first channel are not possible. However, imports through this channel imply that the difference between the official exchange rate and the commercial bank rate is a subsidy covered by MFEP.² This procedure was extensively used in 1988/89 when, given a declining foreign aid contribution, the government was obliged to import more wheat and wheat flour through this system. The direct impact on fiscal costs under this system was considerable.³

Commodity Exchange Operations

Swap operations are transactions in which sorghum is exchanged for wheat flour on the basis of 1.4 tons of sorghum for one ton of wheat flour. Swap operations take place between representatives of international organizations, such as the United States Agency for International Development (USAID), World Food Programme (WFP), and Refugee Office, and the Sudanese government. According to

² For each U.S. dollar, an equivalent of 7.7 Sudanese pounds (SdL) are subsidized, covered by MFEP under this channel. This represents the difference between the official exchange rate of SdL 4.5 per U.S. dollar and the bank rate of SdL 12.2 per U.S. dollar.

³ In 1989, the wheat subsidy was estimated to be SdL 697 million compared to SdL 277 million in 1988 (an increase of 152 percent).

the agreement, the Agricultural Bank of Sudan (ABS) provides sorghum under swap operations and MFEP covers the cost of transportation to targeted areas and populations, such as refugees or the displaced. In rare cases, when ABS is short of sorghum or when available sorghum is committed for export, local currency is used to purchase wheat flour, basically from WFP. This system is used in some cases as an alternative to swap operations; WFP uses the local currency to purchase sorghum or other domestic food items from the market and direct them toward certain target groups.

Grants and Aid

PL 480. These imports are paid for by long-term loans on a concessionary basis. The program began in 1974 and is renewed annually. According to the terms of the agreement, wheat and wheat flour are imported from the United States by a committee consisting of MFEP, MCCA, Bank of Sudan, EXIM Bank, and CIDCO (a limited company for development and utilization of grains). CIDCO is responsible for wheat and wheat flour importation in addition to clearance, storage, and transportation to different mills. This is carried out in close coordination with the follow-up committee of the Council of Ministers, under the supervision of MCCA. Against these obligations, CIDCO is entitled to a commission of 1.5 percent, based on the value of wheat and wheat flour CIF (cost, insurance, and freight) Port Sudan.

The loan under PL 480 is to be repaid over a forty-year period, with a grace period of ten years. The principal is to be paid in equal installments during thirty years with a 3 percent interest rate. Loans under PL 480 continued to decline systematically from 1987 to 1990, as shown below:

<u>Year</u>	<u>Amount</u> (U.S. \$ million)
1987	50
1988	40
1989	30
1990 ⁴	20

Source: MCCA internal reports.

Parallel to this reduction in PL 480 loans, wheat and wheat flour purchases under PL 480 decreased sharply due to increases in international wheat prices and ocean freight rates. Wheat prices increased from U.S. \$110 per ton in 1986/87 to over U.S. \$170 per ton in early 1988 (Ministry of Agriculture 1989). Ocean freight rates went up from U.S. \$22 per ton in the first nine months of 1988 to U.S. \$42 per ton in October of the same year. Such increases in wheat prices and freight rates tend to reduce the quantity of wheat and wheat flour purchased under PL 480 loan agreements, due to the nature of the agreement which stipulates that the loan covers prices and freight costs from U.S. ports.

Grants. This category includes contributions of different donors in the field of grants and aid. Wheat and wheat flour supplies from this group are characterized by high variability from one year

⁴ PL 480 loans for 1990 are estimated to purchase 9,000 tons of wheat.

to another, as they depend largely on the prevailing political atmosphere and production in some producing countries.

Loans From Arab Financial Organizations. These loans are used for purchasing wheat and wheat flour, particularly from Saudi Arabia in recent years. However, this source is not stable and availability of the loan is highly dependent on wheat availability, prices, and political considerations.

WHEAT IMPORT POLICY

MCCS is responsible for estimating annual wheat and wheat flour requirements. Based on estimates of domestic production, working capacity of grain mills, and extraction rate for wheat, the gap between domestic supply and demand is estimated. It is assumed that the difference will be covered by imports. In addition, PL 480 contributions are taken into consideration when arriving at estimates of the level of wheat and wheat flour imports required.

Thus, there seems to be no clear wheat import policy based on consumption growth levels. Much depends on the level of donor contributions, which tends to dictate the level of effective imports. Therefore, it is not surprising that wheat and wheat flour import statistics show continuous annual fluctuations in quantity, value, and source of imports (Table 3). A recent study shows that the coefficient of variation was 87 percent and 147 percent for quantity and value of wheat imports, respectively, during 1960-87 (Food Security Unit, Ministry of Agriculture 1989). For wheat flour during the same period, the coefficient of variation was 98 percent and 177 percent for quantity and value, respectively (Table 4). This high degree of instability and inconsistency with growth in consumption is attributed mainly to the nature of the wheat import policy, which is influenced by domestic prices, donor contributions, and availability of foreign aid. Due to the absence of a clear import policy, these factors tend to play a major role in determining the level of imports. Thus, in reality, import policy seems to be a residual policy, and its effectiveness depends, to a large extent, on the level of contribution of donors. Such a level of dependency makes the sustainability of the bread subsidy policy questionable. Some studies show that the government has been receiving a large fiscal subsidy from commodity aid (IDS 1988). Any considerable shift of commodity aid, therefore, means additional fiscal costs, since the government will have to resort to commercial imports.

Several studies show that wheat consumption will continue to increase due to population increase and urbanization. This means there will be a need for additional imports, since local production will not be able to bridge the gap between domestic supply and demand. Hence, the burden will be on the import side.

Wheat Imports

It has been estimated that an increase by one million in the population size will result in an increase of wheat imports by 23.4 thousand tons (Food Security Unit, Ministry of Agriculture 1989). On the other hand, a similar increase in the urban population will increase wheat imports by 81 thousand tons, which is equivalent to an increase in per capita consumption of wheat by 81 kilograms

Table 3—Wheat and wheat flour imports, 1960-87

Year	Wheat		Wheat Flour	
	Volume	Value	Volume	Value
	(tons)	(millions SdL)	(tons)	(millions SdL)
1978	153.3	8.1	12.0	0.6
1979	192.9	18.2	15.6	1.8
1980	200.0	23.9	48.6	8.4
1981	45.4	5.3	40.4	8.7
1982	211.0	46.9	133.9	22.9
1983	234.7	62.8	148.1	47.4
1984	197.0	58.8	161.1	53.8
1985	246.9	75.5	104.1	55.0
1986	73.6	39.1	42.6	21.4
1987	68.4	20.0	48.8	24.8

Source: Food Security Unit, Ministry of Agriculture, Wheat Imports in Sudan (Khartoum, 1989).

Table 4—Coefficients of variation for wheat and wheat flour imports, 1960-87

Period	Wheat		Wheat Flour	
	Volume	Value	Volume	Value
	(percent)			
1960-69	59	56	65	66
1970-79	79	77	81	111
1980-87	55	58	57	63
1960-87	87	147	98	177

Source: Food Security Unit, Ministry of Agriculture, Wheat Imports in Sudan (Khartoum, 1989).

(FSU 1989). These figures demonstrate the perils of pursuing an import policy based on foreign aid contributions. If, for any reason, donor contribution was substantially reduced, as was the case in 1989, the government will have to resort to commercial imports, which will demand considerable foreign exchange and, hence, increase the fiscal costs of a bread subsidy.

WHEAT AND BREAD DISTRIBUTION NETWORK

Wheat and Wheat Flour

As already seen, there are basically two sources of wheat and wheat flour: foreign and domestic. Foreign wheat and wheat flour come through imports or aid of different forms and go directly to 12 feed mills (Table 5), where wheat flour is extracted at a rate of 80 percent. The 80 percent extracted wheat flour is sometimes mixed with wheat flour from foreign aid of a 72 percent extraction rate and delivered to the bakeries.

On the other hand, the distribution network of domestically produced wheat consists of three channels. Based on production levels and declared prices, part of the domestically produced wheat is delivered to the wheat mills and the remainder goes to consumers, either directly or indirectly, through grain traders and local bakeries. Domestic wheat, which is distributed outside the regulated government system, comes basically from the Northern Province and the Gezira, New Halfa, and White Nile Schemes. Thus, part of the marketed surplus passes through open market channels at higher prices, because wheat can fetch better prices outside the regulated system. It also includes production from the northern region that is privately produced and does not fall under the category of government regulated wheat. In fact, most of the domestic wheat regulated by the government comes from the Gezira Scheme and a small part from the New Halfa Scheme.

Commercially imported wheat flour, on the other hand, goes directly to the traders and is distributed to consumers through retail shops. Part of it also goes to the processing plants, where it is processed into biscuits or sweets and distributed to consumers. Thus the basic channels of distribution for foreign and domestic wheat and wheat flour are the mills, the bakeries, and the traders. The full distribution network is shown in Figure 3.

Bread

According to the national census of 1983, the population of the three towns of Khartoum, Khartoum North, and Omdurman was estimated to be 1.8 million. With an annual growth rate of 5.6 percent, their 1990 population would be approximately 2.6 million. In addition, the number of displaced persons and refugees is estimated at 950,000 and 30,000, respectively⁵ bringing the total population of these three towns to approximately 3.6 million. Against these population statistics, the Khartoum governorate estimates that the number of bakeries in the three towns is around 1,580, out of which 247 bakeries are modern and mechanized, while the remaining 1,333 are traditional. These

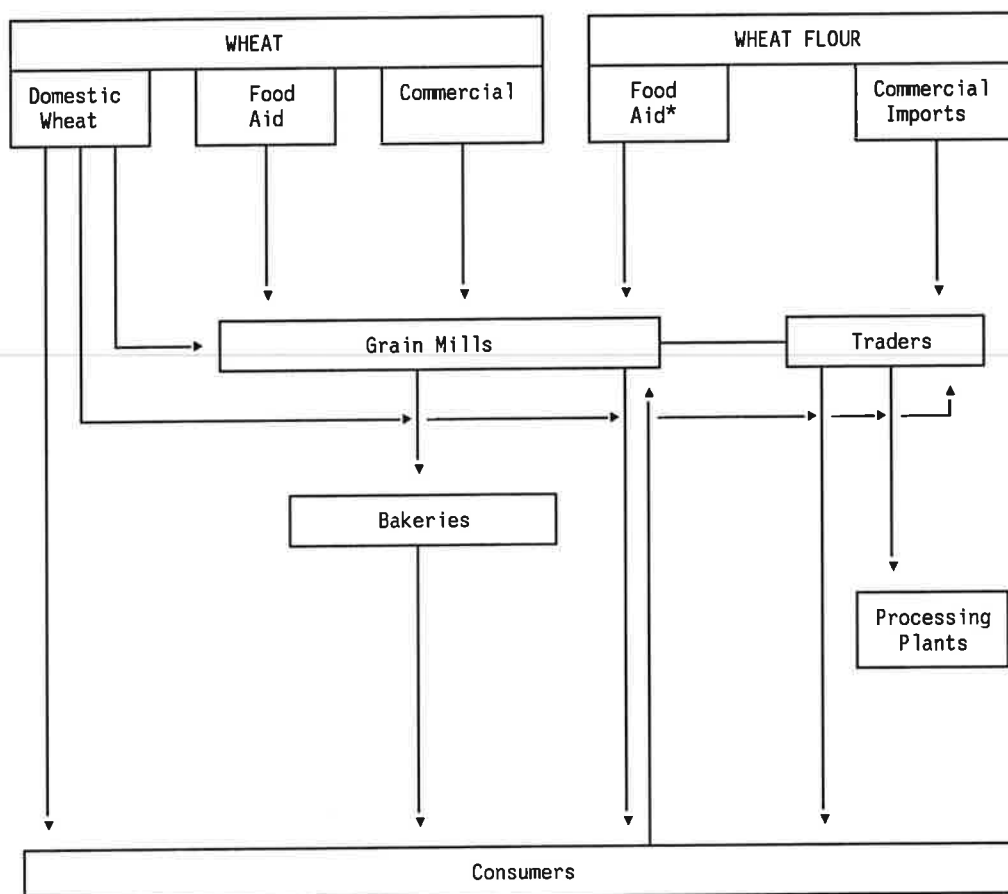
⁵ Some official figures estimate refugees and displaced around the three towns to be 100,000 and 3 million, respectively.

Table 5—Grain mills by capacity and location

Mill	Annual Designed Capacity ^a	City	Province
	('000 tons)		
Khartoum North	180	Khartoum North	Khartoum
Ahlia	150	Khartoum North	Khartoum
Zain Elabdeen	18	Khartoum North	Khartoum
Alarabia	66	Khartoum North	Khartoum
Blue Nile	90	Wad Medani	Blue Nile
Gezira	90	Wad Medani	Blue Nile
Goz Cabaro	72	Elhssahisa	Blue Nile
Kosti	36	Kosti	White Nile
New Halfa	60	New Halfa	Kassala
Atbara	24	Atbara	Northern
Abdu Rabu	72	Port Sudan	Red Sea
Elbaquir	90	Elbaquir	Blue Nile
Total	948		

^a Although designed capacity is estimated at 948,000 tons annually, these mills are working far below their designed capacity. Working capacity is estimated at 590,000 tons. The low efficiency in capacity utilization is attributed to several factors, including irregular flow of imported wheat and technical problems.

Figure 3—Wheat and wheat flour distribution channels



* This does not include aid by the international community directed to refugees and displaced persons.

bakeries are designed to handle about 2,100 tons of wheat flour daily, enough to produce 18 million breads of 120 grams weight each.⁶ However, actual daily delivery figures for 1988 and 1989 show that average daily deliveries were around 1,260 tons. Thus, at present, these bakeries are working at about 60 percent of their designed capacity.⁷ The data also show that urban Khartoum tends to consume around 50 percent of the total regulated wheat flour of the whole country, the daily consumption of which is estimated at 2,500 tons.

Bread distribution channels are simple and straight-forward due to the nature of the subsidy, which is universal and not specifically targeted. There is no specific eligibility criteria that discriminates against some groups. Traditionally, bread is distributed either directly to consumers by the bakeries or indirectly through intermediary outlets such as retail shops, restaurants, and peddlers (Figure 4).⁸ Since prices are controlled, the distribution system through retail shops is not particularly attractive, because there are no significant gains from selling bread alone. As a result, bread distribution through retail shops is restricted, in the majority of cases, to shops which sell bread in addition to other food items, such as broad beans (fool masri). Other retail shops distribute bread as a means of attracting customers for other items. In both cases, bread distribution per customer is restricted in quantity. On the other hand, in the case of restaurants and food shops, bread is distributed as part of the meal and is seldom sold as a separate item. Therefore, distribution of bread through indirect channels is often restricted to limited requirements. The bulk of bread requirements (particularly for household consumption) is, therefore, obtained either directly from the bakeries or through peddlers in market places.

The quantity distributed through one channel or another is highly dependent on supply and demand conditions. For example, in 1988, when bread was in short supply, distribution was restricted to bakeries, cooperatives, and specific residential retail shops. This system tended to discriminate against residents living on the fringes of urban centers and seriously affected their access to bread. It also created a parallel market, in which bread was sold at prices far above the controlled prices.⁹ In many cases, the leakage took place in the bakeries, due to capacity utilization problems. Most bakeries received quantities of wheat flour far below the minimum required for adequate economic performance. Thus, production costs tend to be high and bakeries work at loss. The legal profit margin for bakeries ranges from 7.5 percent to 20 percent, depending on depreciation costs, type of bakery, and number of lines of production. Since bread prices are controlled, the

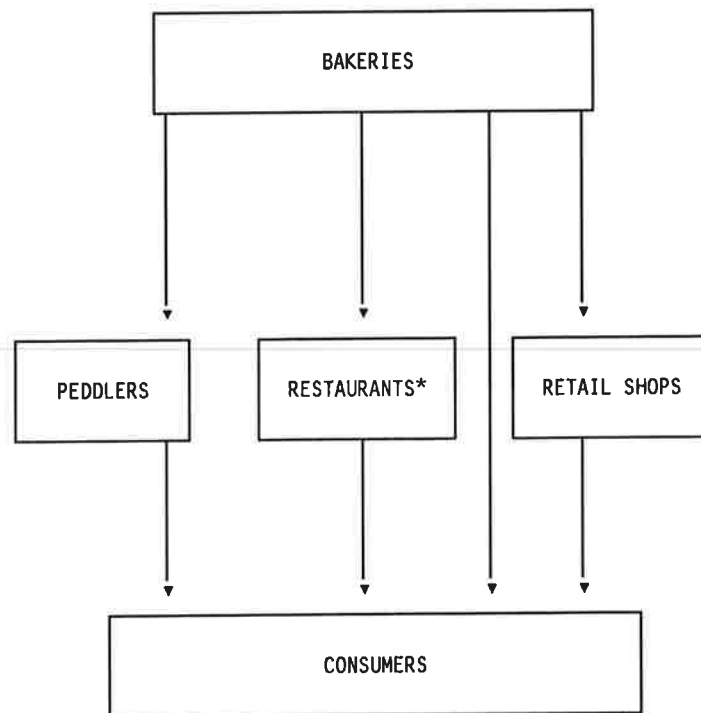
⁶ The weight of bread was reduced from 140 grams to 120 grams in 1989. At the same time, the price of bread was increased from SdL 0.2 to SdL 0.25. Total number of breads is based on a weight of 135 grams before baking, which will produce 120 grams of bread after baking.

⁷ Capacity utilization problems were mainly attributed to irregular supply of wheat flour and power and maintenance problems.

⁸ A considerable amount of bread is distributed to schools, government institutions, hospitals, and so forth through contractors. In Figure 3, such channels are treated as part of the category of restaurants.

⁹ Without intervention and under free access to bread, prices in remote areas used to be SdL 0.05 to SdL 0.1 over the official price. However, with intervention, prices go up to twice or even three times the official price in some cases.

Figure 4—Bread distribution network



* Includes public institution restaurants, hospitals, schools, hotels, and all types of contractual provision of bread, in addition to ordinary restaurants.

degree of capacity utilization plays an important role in determining the profitability of bread production. Difficulties in obtaining the minimum required supply of wheat flour often acts as a disincentive for the bakeries to continue production on a regular basis. Incidences have been registered in which bakers try to accumulate more than one day's allocation in order to perform at economic levels. Such constraints tend to have a negative impact on bread distribution on a regular basis.

A clear understanding of the wheat and bread distribution network is deemed necessary prior to any liberalization. It is of prime importance to conceptualize the complexity of the distribution channels, which are highly controlled by the government. The marketing costs and efficiency of each channel, however, depends on many factors. Therefore, the degree of efficiency of each distribution channel, in terms of resource utilization, cannot be readily assumed.

BREAD SUBSIDY: BENEFITS AND BENEFICIARIES

Objectives

Direct intervention by the government in bread prices started as early as 1969/70. Its main form was intervention at different stages of the wheat production and marketing process (Satar 1983). The government's main concern was to improve the welfare of all categories, and, therefore, the beneficiaries included both the poor and the relatively better off. At that time, the majority of the urban consumers were employees of the government and the trade sector. In addition, neither population growth nor urbanization was seen as a problem. Hence, the general subsidy was viewed as fair.

The strategy to implement this policy was ensured through the government's monopoly of wheat imports as well as through state-controlled wheat production. All regulated wheat is directed towards the local grain mills belonging to the private and cooperative sectors and dependent on quotas of wheat assigned by the MCCS at specified prices. The mills, in turn, deliver the wheat flour to the bakeries at prices set by the government. At the bakeries, bread prices are controlled and bakeries are occasionally supervised or policed by the authorities of MCCS. Thus, success of the distribution policy depends highly on the degree of regimentation by which the government regulates wheat and wheat flour. This is made possible through control of imports by MCCS, donor contributions by MFEP, and domestic production by government schemes.

Any income transfer program tends to require specific objectives, such as improvement of income distribution or increase in calorie consumption. For the bread subsidy program, these were rather implicit in the overall goal of welfare for the people. The subsidy was not specifically designed to address a certain income group: it was a universal subsidy scheme in which the poor and the rich benefitted though, of course, at different levels. The main drive behind the policy was to ensure some degree of stabilization in bread retail prices. Thus, subsidized bread was basically seen as a tool for addressing the rising costs of living for all people. At that time, wheat was not seen as a serious problem. Per capita consumption had been much lower in most areas, and urban population was small. Thus, the main idea behind the universal targeting was to improve the welfare of the

people at large, irrespective of their income group. However, bread consumption became predominantly an urban phenomenon and, at the same time, its largest benefits tended to accrue to the middle and high income groups.

Urban Bias

Evidence on cereal consumption by location is available from the 1986 and 1987 surveys carried out by the Ministry of Health and covering northern Sudan (Ministry of Health, 1986/87 Cereal Consumption Survey). In 1986, bread represented a share of 44 percent, 10 percent, and 3 percent in total cereal consumption among the urban, rural, and nomadic population, respectively (Table 6). Similar findings were established by the 1987 survey, which shows that the bread share in total cereal consumption was 45 percent, 10 percent, and 4 percent for the urban, rural, and nomadic population, respectively. These aggregate figures mask large variations in bread consumption between urban and rural centers within individual provinces. Detailed cereal consumption statistics by each province show that the share of bread in urban centers is higher when compared to rural consumption. In Khartoum, Nile, Red Sea, Kassala, and Gezira provinces bread consumption share was 73 percent, 68 percent, 57 percent, 43 percent, and 45 percent, respectively while the corresponding figures for rural areas were 66 percent, 36 percent, 15 percent, 7 percent, and 17 percent, respectively (Table 7).

Thus it is quite evident from the two surveys that in the urban centers, bread has the largest share within the cereal consumption category. The surveys also found that bread is consumed primarily by the urban areas. Such a result was found consistently across all provinces. The results of these surveys demonstrate clearly that bread consumption has an urban bias. The origin of this urban bias could be related, among other things, to the design of the subsidy, low prices of bread, and convenience to the structure of urban life style.

In the first place, as mentioned earlier, the bread subsidy was designed to address a wide range of beneficiaries, including civil servants, military personnel, and traders, who comprised the bulk of urban consumers at that time. Although the bread subsidy was untargeted, the beneficiaries were the middle and relatively high income groups, by virtue of their consumption behavior, which tend to favor bread. Thus, from the start, bread was consumed by the urban population for whom it was easily accessible in terms of place, income, and taste. With the increase in population and income, these groups have kept their preference for bread.

Second, bread subsidies were introduced at a time when bread prices were higher, compared to those of substitutes such as sorghum. It was not until 1975 that the relative price of bread to sorghum started to decrease. Since then, bread prices have been lower than sorghum prices, due to the subsidy on wheat. Availability of low-price bread coincided with the call for import substitution industrialization policies and decline in agricultural income, which initiated a significant rural-urban migration. Thus, with high growth in urbanization, the urban poor also started to consume bread due to its low relative price.

Third, bread is more convenient to the style of urban life, particularly with women joining the public and private sectors, as well as the informal sector. Very recently, the cost of charcoal and firewood was a significant factor in pushing even the very poor families towards bread consumption

Table 6—Share of bread in total cereal consumption, 1986-87

Location	1986			1987		
	Grains	Bread	Kisra	Grains	Bread	Kisra
Urban	55	44	1	54	45	1
Rural	90	10	0	90	10	0
Nomad	97	3	0	96	4	0
Province						
Khartoum	44	56	0	46	54	0
Northern	78	21	0	68	32	0
Nile	55	44	0	57	42	1
Red Sea	71	27	2	66	33	1
Kassala	84	15	1	81	18	0
Blue Nile	85	14	0	88	12	0
Gezira	78	22	0	79	12	0
White Nile	85	14	0	86	14	0
North Kordofan	95	5	0	95	5	0
South Kordofan	97	3	0	97	3	0
North Darfur	97	2	1	95	4	1
South Darfur	97	2	1	96	3	1

Source: Ministry of Health, 1986-87 Survey.

Table 7—Share of bread in total cereal consumption, by urban and rural location, 1986-87

Location	1986			1987		
	Grains	Bread	Kisra	Grains	Bread	Kisra
Khartoum						
Urban	27	73	...	28	72	...
Rural	66	66	...	72	28	...
Northern						
Urban	77	23	...	80	20	...
Rural	79	21	...	85	35	...
Nile						
Urban	31	68	...	26	73	1
Rural	64	36	...	69	31	...
Red Sea						
Urban	35	57	8	26	69	5
Rural	85	15	...	83	17	...
Kassala						
Urban	53	43	4	38	57	5
Rural	93	7	...	94	6	...
Blue Nile						
Urban	80	20	...	81	19	...
Rural	87	13	...	90	10	...
Gezira						
Urban	54	45	1	59	39	1
Rural	83	17	...	83	17	...
White Nile						
Urban	74	25	1	84	15	...
Rural	90	10	...	87	13	...
North Kordofan						
Urban	85	15	...	80	20	...
Rural	97	3	...	98	2	...
South Kordofan						
Urban	89	11	...	92	8	...
Rural	98	2	...	98	2	...
North Darfur						
Urban	81	18	1	74	24	...
Rural	99	1	...	98	1	...
South Darfur						
Urban	89	10	1	85	13	2
Rural	98	1	1	97	2	1

Source: Ministry of Health, 1986/87 Survey.

due to acute shortage of cooking energy. All these factors have contributed in one way or another to the urban bias in bread consumption.

Bread Subsidy and the Poor

The problem with the bread subsidy lies in its original design to address a wide range of beneficiaries. Targeting is crucial to achieve the desired objectives with respect to some intended beneficiaries. In the absence of such targeting, one can only look at relative gains in terms of calorie consumption and real income of both the poor and the rich. In a universal subsidy program, gains accrue to the beneficiaries in different proportions, depending on how the cost of the subsidy is distributed. There is evidence that the rich have benefitted more (Pinstrup-Andersen et al. 1983). Due to the nature of the bread subsidy, the benefits tend to be progressive, increasing with the level of bread purchases. Therefore, any change in bread prices tends to affect the poor more than the rich. A study shows that increases in bread prices will tend to reduce the real income of the poor by twice the reduction in higher income groups (Pinstrup-Andersen et al. 1983).

However, an increase in the price of bread does not necessarily mean a shift of demand in favor of other substitutes, such as sorghum flat bread (kisra). This is because of the very low cross price elasticities for kisra and bread, partly due to the low price of bread relative to the price of kisra. Convenience and cost of preparation of kisra provides another reason. Table 8 shows the average budget shares by commodity group for urban Khartoum. For the poorest population group, expenditure on bread represents 7.4 percent of total expenditure on food, and is equivalent to approximately SdL 5. At 1990 official price of bread and market price of kisra, SdL 5 can purchase 20 loaves of bread or 5 pieces of kisra. Five pounds worth of kisra is hardly enough for two meals for one person. Thus, even with a substantial increase in bread price, kisra will probably tend to be more expensive.

Furthermore, kisra and bread preferences are related to convenience and expenditure on charcoal and firewood. On average, 82 percent of the expenditure on fuel of low income households in urban areas is on charcoal and firewood (Household Income and Expenditure Survey 1978/80). This represents 5.4 percent of total average annual expenditure of such households. It is, therefore, necessary to realize that preference of bread to kisra is more than a comparison of price relationships between wheat and sorghum. In 1989, prices of wheat and sorghum were almost the same, but fuel prices (charcoal and firewood) were beyond the reach of low income households. Therefore, an increase in the price of bread will tend to have serious implications on the income of the poor. A case in point was the increase in retail bread prices in 1989 from SdL 0.2 to SdL 0.25 per piece of bread. At the same time, the weight of bread was reduced from 140 grams to 120 grams, an equivalent of a rise in price of SdL 0.03. Thus, the overall price increase was SdL 0.08, equivalent to a 40 percent increase in bread price. The implications of such an increase on the calorie consumption of the low income groups is quite significant. According to Pinstrup-Andersen et al (1983), a one percent increase in bread price in urban Khartoum will reduce calorie consumption of low income groups by 3.5 calories per day. Accordingly, the 40 percent increase in price of bread in 1989 is expected to reduce calorie intake per person by 140 calories per day. This corresponds to about 25 percent increase in existing calorie deficiencies among the low income groups. Thus, calorie consumption

Table 8—Average budget shares by commodity group for urban Khartoum

Share of Total Expenditure By Food Group	Expenditure Stratum					Entire Sample
	1	2	3	4	5	
	(percent)					
Bread	7.40	7.23	6.78	6.65	4.04	4.95
Sugar	6.40	5.85	5.39	4.99	3.00	3.80
Cereals	4.99	4.28	3.84	3.26	1.64	2.37
Meat	13.35	14.14	13.47	13.43	8.99	10.43
Milk and other products	6.68	6.80	6.30	5.98	3.69	4.54
Fruits and vegetables	11.60	11.19	10.56	10.25	7.12	8.27
Other food	14.42	14.00	14.52	14.48	11.89	12.67
Total food	64.84	63.49	60.86	59.04	40.37	47.03

Source: Per Pinstrup-Andersen et al., "Impact of changes in incomes and food prices on food consumption by low-income households in urban Khartoum with emphasis on the effects of changes in wheat-bread points" (International Food Policy Research Institute, Washington, D.C., 1983, Mimeographed).

by the low income group is very responsive to bread price and change in income. Although, under the present universal bread subsidy system, an increase in bread price will tend to affect the real income of all groups, the most negative impact will be felt by the low income groups.

Since there is no specific calorie target stipulated by the subsidy program, it is difficult to assess whether, in terms of calorie consumption, the bread subsidy has realized its objectives. A survey among low income households in urban Khartoum shows that the minimum required calorie consumption could be in the range of 2,382 calories (Table 9). If this assumption is acceptable, then one can infer that calorie deficiency among the lower stratum could have been improved if benefits, which accrue to higher expenditure households, were directed to these low income groups. The benefits realized by the higher expenditure classes obviously reduced calorie intake by lower income groups. Thus, targeting is crucial in order to remove the present universal eligibility criteria and confine the bread subsidy to the lower expenditure groups. In the absence of such a policy, an universal bread subsidy would continue to undermine the goals of food security by syphoning off the larger benefits to the better off groups. Although such an outcome was not consciously planned, the way the subsidy was designed and its broad objectives systematically lead to such a negative impact on the urban poor. If this trend continues unchecked, then the food security of the urban poor will be seriously affected.

WHEAT PRICING POLICIES: THE IMPACT ON FOOD SECURITY

Food security in the long run was seen to be realized through higher growth rates in agriculture, creation of employment, and improved income distribution. However, in the short run, food security goals were hoped to be realized through intervention in the food system to maintain low food prices to address both rural and urban poverty. In the case of wheat, the goals of keeping consumer prices low and, at the same time, providing incentives to the producer were often conflicting.

Procurement of wheat produced locally is determined by the MCCA. Historically, a wheat price committee, appointed by the Minister of Agriculture, presents a study covering the financial costs of production for domestic wheat. The declared prices of MCCA, however, do not necessarily reflect the estimated cost of production. Since domestic wheat can fetch higher market prices, tenants deliver a certain minimum, which tends to fluctuate, depending on the volume of production and price incentives. One drawback has always been that procurement prices are often declared very late toward the harvesting season. This has a negative impact on the amount of wheat delivered to mills, due to delay in harvesting operations. In the 1988/89 season, delayed harvesting, in anticipation of increased procurement prices, led to losses in the Gezira Scheme alone, estimated by Global 2000 Inc. of between 20-30 percent, due mainly to shattering prior to and during harvesting operations. Losses due to inefficiencies in production are often reflected later on in higher prices to be paid by the budget. In 1988 and 1989, declared prices were higher than the import parity price, calculated at the official exchange rate.¹⁰ For example, in 1988/89, the declared price for domestic wheat was

¹⁰ Of course, if economic rather than financial prices are used, taking into consideration the over-valued exchange rate, the net result would be a tax and the producer would be at a disadvantage.

Table 9—Reported calorie consumption by sample population in urban Khartoum

Indicator	Calorie Strata ^a				Entire Sample
	1	2	3	4	
Sample size ^b	716	705	768	2,741	4,930
Calorie consumption	1,453.83	2,164.80	2,609.62	4,056.51	2,939.44
Calorie requirements	2,414.67	2,412.85	2,376.38	2,358.48	2,382.67
Calorie sufficiency	-960.84	-240.05	+233.24	+1,698.03	+556.77
Average family	9.3	8.7	7.8	5.4	6.8
Population share (percent)	19.81	18.15	17.84	44.20	100.00
Total income share (percent)	12.83	14.15	16.69	56.33	100.00
Total expense share (percent)	11.66	14.71	15.22	58.41	100.00

Source: Per Pinstруп-Andersen et al., "Impact of changes in incomes and food prices on food consumption by low-income households in urban Khartoum with emphasis on the effects of changes in wheat-bread points" (International Food Policy Research Institute, Washington, D.C., 1983, Mimeographed).

^a Households stratified according to degree of calorie sufficiency/deficiency:

- Stratum 1: Consumption below 80 percent of requirements,
- Stratum 2: Consumption 80-100 percent of requirements,
- Stratum 3: Consumption 100-120 percent of requirements,
- Stratum 4: Consumption above 120 percent of requirements.

^b Household-months. Most households were interviewed during each of three consecutive months. Each visit was treated as an independent sample unit. Thus, while the total number of household-months was 4,930, the actual number of households was approximately one-third, or 1,643.

SdL 2400 per ton compared to SdL 978 per ton of imported wheat on the basis of the official exchange rate. Domestic wheat is procured for SdL 2,400 a ton and delivered to grain mills for a controlled price of SdL 992 per ton. Thus, based on the deliveries of 60,000 tons of domestic wheat in 1988/89, the annual fiscal cost is estimated at approximately SdL 85 million.¹¹ Such figures reveal that domestic wheat is highly subsidized at prices more than double the price of imported wheat.

In most cases, the argument behind producer price subsidies was based on the assumption that changes in agricultural income will change poverty, because the rural poor derive their income from agriculture. However, there is evidence that the condition of the poor (urban and rural) has worsened. A comparison of the household budget survey of 1967/68 and the household income-expenditure survey of 1978/80 reveals that the Gini Coefficient, a measure of income distribution, increased during this period from 0.41 to 0.56. During the same period, the income earned by the poorest 40 percent of the population fell from 16 percent to 12 percent. In comparison, the richest 10 percent earned 38 percent in the 1978/80 survey compared to 33 percent in the 1967/68 survey. Partly as a result of this uneven income distribution and declining agricultural productivity, large numbers of the labor force have shifted from small scale food production to non-food cash crops or mechanized farming food production. In particular, the active male labor force has tended to join cotton, sugar, or mechanized farming, or has increased the pool of the urban poor. On the other hand, a considerable number of the displaced and urban poor derive their income from outside agriculture. The informal sector is providing income, although very low, to a number of those who left the agricultural sector.

Under such realities, policies with respect to producer prices, particularly in the food sector, need special consideration. Small-scale rural food producers are no longer surplus food producers. In fact, a majority of them are food-deficit producers, supplementing their food production from food surplus areas. Increasing food prices would have been an effective food security tool if the rural poor were net food producers. Food production data show that surplus food areas are in the mechanized farming areas and, for wheat, in the Gezira Scheme. These groups are definitely not the rural poor. Therefore, any attempt to increase agricultural food prices will tend to increase agricultural sector income for a small group of producers. Thus, increased agricultural commodity prices (food) could mean a transfer of income from consumers to unintended beneficiaries, but this does not show its full effect because the government interferes to cover the producer subsidy and, at the same time, provide subsidized bread to consumers. In such cases, a producer subsidy policy would tend to widen the income gap between the rural poor and the rest. There is no doubt that increasing producer prices is one way of stimulating higher production, yet it is not necessarily a solution for food insecurity. To increase production should remain at the top of the agenda of agricultural development, but it is equally important to recognize how this is done, without affecting food security in a negative sense.

Thus, the government seems to be cushioning the negative impact of both producer and consumer prices through interventions at different stages of the production and marketing of wheat. Such policies are not conducive to a long-term increase in wheat production because it does not provide enough incentives for the development of the full potential of wheat. Rather, producers and

¹¹ Calculated on the basis of the difference between import parity price and declared domestic wheat prices $(2,400 - 978) \times (60,000)$.

consumers will tend to seek short-term gains through pressure groups and the budget will continue to pay high fiscal costs. A better strategy would be to remove producer subsidies, giving farmers the import parity price equivalent while gradually substituting the general consumer subsidy by a targeted subsidy.

Experience shows that rationing as a targeting system is difficult to implement and can lead to development of parallel markets, mainly due to lack of effective and efficient networks that allow a certain level of control and management. In the absence of a reliable criteria by which households can be identified by income groups, rationing by residence would tend to exclude the urban poor on the fringes of the urban centers. Thus, there needs to be a transfer mechanism that would address the urban poor as target groups, if targeting is to succeed. The only way this can be implemented is for it to be channeled through a scheme that provides self-targeting food. Normally, such food items have negative income elasticities of demand and are less preferred as staple foods. In such cases, the higher the income, the lower the consumption of the less-preferred staples, such as sorghum. Provision of such foods will tend to benefit the poor rather than the high income groups, who would, hopefully, reduce consumption by their own choice, due to preference or taste. A case in point is the composite bread developed by The Food Research Center (FRC), which, if targeted, could play an important role in directing benefits to the poor. Composite bread is made of wheat and sorghum at different ratios.¹² Targeted composite bread can be made available at subsidized prices, while pure wheat bread can be left to fetch its full market price.

Thus, providing wheat producers with import parity equivalent prices, making pure wheat bread available at full market costs, and targeting composite bread at subsidized prices can provide a more realistic policy package to address the wheat subsidy problem.

FISCAL COSTS OF WHEAT SUBSIDIES

The fiscal costs of wheat subsidies can be divided into two categories. The first category comprises subsidies provided by MFEP to cover the difference between wheat imports on the official exchange rate and the free bank rate. The bulk of the commercial imports fall under imports through the free bank rate of about SdL 12.2 per U.S. dollar. The difference of SdL 7.7 for each U.S. dollar is a subsidy paid by the government. The second category includes payments to domestic wheat producers. The government receives domestic wheat from tenants at declared procurement prices and the wheat is delivered to grain mills at prices far below the procurement prices paid to the tenants. The price paid to domestic producers was also higher than the import parity price of wheat at the official exchange rate.¹³

Table 10 shows wheat subsidies from 1985 to 1989. It can be clearly seen that the burden of subsidies to the budget is consistently increasing, both from the import side as well as from

¹² Composite bread is not considered as an inferior food by high income groups, particularly mixtures of up to 30 percent sorghum and 70 percent wheat. Thus, more sorghum to wheat ratios are needed if a negative income elasticity demand is to be created.

¹³ Import parity price for wheat was estimated to be SdL 978 per ton CIF Port Sudan.

Table 10—Wheat subsidies, 1985-89

Year	Subsidies		Total
	Imports	Domestic Production	
	(million SdL)		
1985	...	...	145
1986	162	21	183
1987	236	26	262
1988	250	27	277
1989	660	37	697

Source: Ministry of Commerce, Cooperation, and Supply.

domestic production. The danger inherent in the dependence on foreign aid is clearly demonstrated by the 1989 situation. From 1985-88, the government was heavily dependent on foreign aid, which used to subsidize the budget through provision of concessionary wheat and wheat flour. The government was thus able to continue providing low priced bread to consumers at a fiscal cost highly subsidized by foreign aid. However, in 1989, foreign assistance was reduced sharply and the government was compelled to import wheat commercially, using the free bank rates. This led to a sharp increase in import subsidies because the increase was not transferred to consumers who continued to pay low bread prices. Import subsidies increased by 164 percent between 1988-1989, while domestic wheat subsidies increased by 37 percent. Such increases have a serious effect on the budget. With bread prices remaining low, the government will continue to pay for more subsidies through both imports and domestic production.

POLICY CONCLUSIONS

Evidence shows that bread consumption has an urban bias; this was found to be the case in urban Khartoum and across the regions. If bread is made available at subsidized prices, the poor also gain from bread consumption, but, in general, the tendency is for the better off to get more benefits from bread consumption. Continuation of the general subsidy in the face of such realities, therefore, could only mean that benefits would be distributed unevenly between the poor and the rich. In terms of social justice, there is no rationale at present for continuing the universal bread subsidy program.

The ability of the government in recent years to support the general bread subsidy policies was due to the positive contribution of foreign aid with respect to fiscal costs. However, there are several perils that lie ahead in continuing this policy. In the face of rising consumption, modest domestic production, and constraints of foreign exchange, any major change in foreign aid means importation at high fiscal cost. A decline in donor contribution could be predicted, due either to political factors or to shortage of wheat food aid supplies by the major aid donor countries. For these reasons, a subsidy policy financed by concessionary wheat should be seen as posing a threat to the continuity of such a policy.

Urgent action is needed at both producer and consumer subsidy levels. Provision of an import parity equivalent price to producers of wheat, introduction of self-targeting composite bread, and removal of the universal subsidy are seen as options for addressing the wheat dilemma. On the wheat production side, the findings and recommendations of the Agricultural Research Corporation and Global 2000 provide great hope that domestic production could play a significant role (Narvaez, Valencia, and Dowsell 1989). However, this is subject to adoption of the recommendations presented by the Sudan Global 2000 project. Such recommendations include further investment in agricultural production inputs, technology, and irrigation systems.

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SUPPLEMENTARY TABLES

Table 11—Value of wheat and wheat flour imports, 1960-87

Year	Value
	('000 SdL)
1960	1,859
1961	2,361
1962	2,090
1963	992
1964	3,518
1965	2,710
1966	3,650
1967	4,140
1968	274
1969	1,629
1970	3,691
1971	3,685
1972	5,089
1973	9,094
1974	4,164
1975	5,547
1976	1,354
1977	6,475
1978	8,699
1979	19,972
1980	32,351
1981	14,011
1982	69,877
1983	110,210
1984	112,610
1985	130,650
1986	60,657
1987	44,916

Table 12—Volume and value of wheat imports, 1960-87

Year	Volume	Value
	(tons)	(SdL)
1960	...	...
1961	40,966	924,825
1962	46,037	1,092,968
1963	17,945	494,940
1964	54,798	1,620,180
1965	43,371	1,337,218
1966	31,436	820,196
1967	22,240	634,393
1968	4,142	719
1969	32,183	716,040
1970	132,384	3,112,108
1971	137,678	3,464,077
1972	205,487	4,925,018
1973	190,000	8,304,871
1974	94,000	3,327,481
1975	119,000	5,493,745
1976	119,620	1,244,535
1977	132,030	5,967,785
1978	153,287	8,109,426
1979	192,942	18,162,557
1980	200,126	23,921,967
1981	45,424	5,276,762
1982	211,078	46,951,226
1983	234,735	62,838,578
1984	197,152	58,827,505
1985	246,991	75,557,888
1986	73,610	39,159,519
1987	68,490	20,065,330

Source: Food Security Department, Ministry of Agriculture, Wheat Imports in the Sudan (Khartoum, 1989).

Table 13—Volume and value of wheat flour imports, 1960-87

Year	Volume	Value
	(tons)	(SdL)
1960	76,272	1,858,775
1961	46,289	1,267,702
1962	30,355	996,854
1963	15,791	496,806
1964	53,037	1,897,728
1965	42,618	1,373,170
1966	88,469	2,830,097
1967	122,995	3,505,715
1968	9,551	273,027
1969	42,719	913,445
1970	21,541	578,592
1971	6,789	221,229
1972	5,337	163,918
1973	27,000	789,000
1974	15,521	836,843
1975	1,688	52,816
1976	1,095	109,500
1977	9,177	507,296
1978	12,098	589,464
1979	15,632	1,809,392
1980	48,555	8,429,297
1981	40,440	8,734,491
1982	132,929	22,925,883
1983	148,132	47,371,737
1984	161,165	53,781,852
1985	104,164	55,094,873
1986	42,590	21,497,288
1987	48,799	24,850,245

Source: Food Security Department, Ministry of Agriculture, Wheat Imports in the Sudan (Khartoum, 1989).

Table 14—Annual growth rates in wheat and wheat flour, 1960-87

Period	Wheat		Wheat Flour	
	Volume	Value	Volume	Value
	(percent)			
1960-69	-11.55	-32.05	-2.57	-3.55
1970-79	-0.55	11.26	8.04	23.48
1980-87	-6.63	12.85	-0.45	19.33
1960-87	7.00	22.84	1.65	14.18

Source: Food Security Department, Ministry of Agriculture, Wheat Imports in the Sudan (Khartoum, 1989).

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