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**The Consumption Effects of
Agricultural Policies in Tanzania**



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FINAL REPORT

The Consumption Effects of Agricultural Policies in Tanzania

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EXECUTIVE SUMMARY

Tanzanian policies toward agriculture and trade have had important effects on the lives of almost all Tanzanians in the past decade. The nation has sought to provide for the basic needs of its population; one of the most important of these needs is food. The impact of policies on the availability and cost of food has been quite different for important segments of the population. This differential impact has resulted from the policies affecting the grain markets and their interaction with the domestic economy.

Tanzanian policies on trade, money, and the importation, manufacture, and distribution of capital goods to rural areas have all changed the structure of incentives faced by farmers. The major effect has been a decrease in incentives to produce either cash crops or food crops for the market. This is due to a worsening of the officially-measured terms of trade between the agricultural and non-agricultural sectors, as well as to the extreme scarcity of consumer goods in rural areas through both official channels and high-priced unofficial ones.

Within this generally depressed environment for agricultural production, the nature of incentives faced by farmers has encouraged food production relative to the production of export crops. An increasing share of the value of export crops has been taken by the government, either through taxes and increased parastatal costs or through the indirect tax caused by Tanzania's overvalued exchange rate. In addition, most farmers can more easily gain access to higher-priced parallel markets for food crops than for export crops. Further, cash crop producers have little access to officially marketed supplies of grain for their consumption needs, and thus have increased incentives to produce their own food. This return to subsistence production has not been the result of deliberate "food first" policies; incentives to farmers were most strongly affected by a capital-biased development strategy which emphasized basic manufacturing industries. A consequence of the return to subsistence food production by farmers who have traditionally produced export crops is that the domestic resource costs of producing food are high relative to the alternative use of those resources.

The regulation of price, transportation, and entrepreneurship in agricultural markets has also had important effects. The majority of grain transactions are legally required to go through the National Milling Corporation (NMC). The parastatal has been limited by its inability to compete with parallel market prices, by the multitude of difficult and sometimes conflicting roles which it is required to perform, and by its own poor organization and shortage of trained manpower. The NMC's primary function has been to provide processed grain to Dar es Salaam and other important urban areas at a price below the parallel market price. Thus, residents of other towns and virtually all rural Tanzanians must buy food on other markets at higher prices.

The interaction of the NMC and unofficial markets increases the instability of supplies to urban consumers caused by output fluctuations due to variations in rainfall. When supplies are scarce, parallel market prices rise and

illegal sales and exports get a higher percentage of farmers' surpluses; the NMC price does not adjust, purchases fall, and Tanzania becomes even more dependent on imports to feed the dependent urban population.

The overall impact on food consumption of urban consumers depends heavily on their access to NMC supplies. The urban poor and low-wage workers who have been able to buy NMC grains have probably maintained their consumption over the decade; this group is disproportionately located in Dar es Salaam and Tanga. Urban residents without access to NMC supplies have probably decreased their consumption due to the high prices and unreliability of parallel markets.

Rural people dependent on markets for all or part of their grain requirements have probably decreased their consumption because of their forced reliance on parallel markets. This group includes estate workers and those growing primarily cash crops. Many of these people have reacted by making food crop production their primary economic activity, thus reducing their market dependence. Rural food producers have probably maintained food consumption levels while reducing their consumption of non-agricultural goods. In times of bad harvests these people, too, reduce their food consumption because of the difficulty of storing or trading for surpluses.

PRESENTATION

This report presents the results of one of several short-term policy impact studies conducted under the Consumption Effects of Agricultural Policies Project. The project has been sponsored by the Office of Nutrition of the United States Agency for International Development, Bureau for Science and Technology. The general objective of the project is to provide analytical examples of the impact of agricultural policies on the consumption of food in developing countries. Through these examples it is expected that agricultural and economic planners will be made more aware of the role of policy decisions in determining the nutritional status of low income households. Specifically, these studies attempt to trace the effects of policies on food demand and use by individual households.

The project has two additional objectives. One is to illustrate the feasibility of performing significant food policy analyses within a short period of time and at a relatively low resource cost. The other is to foster an awareness and capability for ongoing analysis in institutions which formulate or recommend policies that have a direct or indirect effect on the consumption of food by low income households.

In Tanzania the dominant influence on the consumption of food by different groups in the population has been the country's strategy towards industrialization. This strategy has depended on heavy investments in capital equipment for basic industries which were financed through international borrowing and high taxation (explicit and implicit) of agricultural exports. Concomitantly, food prices for urban consumers have been kept artificially low through subsidies to the main staples, parastatal control of the markets for cereal grains, and a substantial reliance on food imports (particularly food aid and concessional sales).

When the study was initiated it was expected that the 1976/1977 Household Budget Survey would be available for comparison with the 1969 Household Budget Survey. The study hypotheses were centered on the changes in food use and food expenditure patterns to be identified through statistical analysis of the two surveys. Although repeated efforts were made to obtain access to that data, the study team was forced to operate without any of that information. Without access to consumption data the study team chose to concentrate on the relationship between the official and unofficial (and illegal) markets for grain in the context of overall macroeconomic and agricultural policies. The official price setting mechanism and the functioning of the grain marketing parastatal, the National Milling Corporation (NMC), are the proximal determinants of both the structure of incentives facing food producers and the costs of food supplies facing food consumers.

The field work was undertaken from May to August 1981 by the senior author, Mr. Andrew G. Keeler, as a guest of the Market Development Bureau of the Ministry of Agriculture (Kilimo). The team received assistance from a number of institutions, most notably the Economic Research Bureau of the University of Dar Es Salaam, the Kilimo/FAO Early Warning Systems and Crop Monitoring Project, and the Tanzania Food and Nutrition Center. Through these efforts, significant new information has been developed on the linkages between

general macroeconomic policies, the structure of incentives facing agriculture as a whole, the functioning of unofficial markets in the presence of parastatal control of the official market, and the implication of these linkages for food costs for different groups in the population.

When the study was formulated there were a number of issues which were considered relevant to the food consumption situation. Several of these have not been directly treated in the report. In some cases our findings are that the issues are not as important as originally thought. In other cases the issues could not be addressed without the food consumption data. The foremost example of the former centers on the tradeoff between cash crops and food crops. A major research issue had been whether or not the secular path of foreign exchange earnings resulting from an orientation of production of cash crops for export would have been sufficiently large to provide more foreign exchange than that necessary to purchase food commodities in international markets. This is not an important issue because in the last half of the 1970's, food imports averaged less than six percent of the total import bill and only 13 percent of the value of total exports.

Through the taxation and regulation of agriculture and the macroeconomic consequence of its industrialization policy, Tanzania finds itself in a deteriorating economic situation. In this context, the dependence of parts of the urban population on low-cost food supplies creates a policy dilemma: actions which might be directed toward improving the incentives for agriculture may in the short run have deleterious effects on the politically important urban population. We hope that the results of this report might contribute to the ongoing policy debate in Tanzania.

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I. INTRODUCTION

Tanzania's development strategy since the Arusha Declaration in 1967 has been centered on reliance on the country's own resources as the basis for development and for meeting the basic needs of its people.¹ Food consumption is widely regarded as a basic need. This study analyzes Tanzania's experience in meeting grain requirements of different groups in the period after the Arusha Declaration. The study focuses on agricultural and economic policies which have directly affected the distribution of grains for human consumption.

The role of grain markets in determining the availability and cost of basic food grains for different consumer groups is analyzed in the context of the implementation of Tanzania's development strategy during the 1970s. The politics and official actions which determined official pricing, procurement and distribution of grains have been the principal determinants of the availability and cost of food for different consumer groups in the population. The impact of these policies has been different for important segments of the population -- urban dwellers with access to official markets, urban dwellers without access to official markets, rural dwellers whose traditional activities center on food production, and rural dwellers who rely (or relied) on markets for their food needs. This differential impact has resulted from the policies that affected the functioning of grain markets and those that affected the interaction of these markets with the performance of the economy as a whole. The markets for grains have been significantly affected by the country's macro-economic and development policies. These effects have had important differential impacts on the cost of food for the various consumer groups.

The dominant policies and actions which have affected the patterns and costs of food consumption are not agricultural or food policies, but rather the policies and actions which sought to implement a development strategy which has been focused on investments in basic industries. Food and agricultural policies have not been the central issue in Tanzanian development activities in the last decade. Contrary to popular belief, the strategy for self-reliant development has not focused on food first or even on agriculture, but on the creation of a capital-based basic industrial sector. This study is directed at food and agricultural policies and their consumption effects. Because of the dominance of these industrialization policies, the consumption effects of agricultural policies in Tanzania cannot be studied in isolation from the major macro-economic consequences of the industrialization policy and the effect of these on the agricultural sector and on the costs of food.

Accordingly, the report begins with an overview of the evolution of important macro-economic factors and how these have affected resource allocation in the agricultural sector. This overview describes the policy setting in which the markets for grain operate. The core chapter of the report analyzes the structure and performance of grain markets and the final chapter traces the effect of grain marketing policies in the context of the development strategy on the likely effects on food consumption by the various consumer groups.

2. THE POLICY SETTING: SELF-RELIANCE AND INDUSTRIALIZATION

Many of the issues which relate to availability, distribution and cost of food for different segments of Tanzania's population have their origins in the political and economic conditions prior to independence; this study, however, considers the decade of the 1970s and the period after the Arusha Declaration. The main thrust of the development strategy has been self-reliance; the country's present and future own resources were to provide the basis for a national transformation to socialism. In the broad interpretation given to the concept of self-reliance, this includes the opportunity of acquiring the resources needed for development through trade and through borrowing. In this context, even foreign aid is viewed as an instrument towards self-reliant development if, along with trade and borrowing, it provides the resources for improving the productive capacity of the country.¹

The domestic resource base for Tanzania was at the time of the Arusha Declaration, as it is today, its people and its agriculture. These resources were to provide the springboard for development -- agriculture was and is being asked to provide both food for domestic consumption and foreign exchange earnings for acquiring goods and services necessary to develop an industrial base. Furthermore, borrowing in international financial markets could be and was used to acquire capital and intermediate goods for the establishment of basic industries.² It is the interaction of the agricultural policies with the macro-economic consequences of the industrialization policies that has most strongly influenced food consumption in Tanzania.

Tanzania's food policy has not been directed at a trade-off of food versus cash crops; there is little evidence that Tanzanian agriculture has ever faced that dilemma. Rather, policy was directed at generating more output

from agriculture, because both cash crop exports and food were necessary to support the industrial transformation.

There are many factors which have affected the performance of the agricultural sector in relation to the twin goals of more food for the people and greater export earnings to help finance development. The performance of the agricultural sector has been significantly lower than was called for in the development plans and significantly lower than what is widely believed to be its production potential. Among the factors which have depressed the performance of the sector, it is common to note the impacts of villagization and of bad weather. This study does not analyze either of these two important factors; it concentrates on pricing and pricing policy in grain markets and the interaction of these with the market for foreign exchange and international commodity prices. The impact of villagization on food consumption is a complicated issue which would require infinitely more human and material resources and time than what was available for the study. The impact of weather and climate is also complex and beyond the scope of this study; nevertheless, the instability of weather as an important factor cannot be ignored. While the study has not been directed at explicit analysis of weather variations and their effect on food supplies and food consumption, the analysis will show that official pricing and procurement policies in the markets for grains tend to exacerbate the fluctuation in food supplies reaching different segments of the population. The study, thus, concentrates on pricing and procurement policies in the markets for grain and how the consequence of these policies have interacted with the macro-economic environment and the physical environment to determine the level and stability of food supplies and food costs for different segments of the population in Tanzania.

The policies and programs affecting the structure of incentives facing individual agricultural producers are important to understanding food

consumption effects. We focus on two major categories of policies: Those affecting the level of incentives to agriculture as a whole and those which influence the way in which markets communicate information and carry out transactions involving food. The first category includes trade policy, monetary and exchange rate policies, import allocations, and consumer goods distribution; these are discussed in the following sections. The second category, consisting of policies guiding and regulating the parastatal marketing agencies, official prices, the transportation system, and the functioning of "parallel" or unofficial markets, is examined in Chapter 3.

2.1 The Structure of Incentives in Agriculture

The primary focus of this study is the impact of agricultural policies on food consumption. To determine the effects of these policies it is necessary to consider how they affect the prices of food commodities and the level of real income of different groups. Much of the population is in the rural sector, and their real incomes depend on both the level and structure of agricultural production, and on the prices they receive for their products and the prices they pay for consumer goods. Scholars of Tanzanian political economy recognize that agricultural prices are a "crucial matter" to Tanzania's attempts to "build socialism" since they affect agricultural incomes and are an "important political instrument" in increasing agricultural production through their incentive effect for producers.³

Tanzanian policies on trade, money, and the importation, manufacture, and distribution of consumer and capital goods to rural areas have all changed the incentive structure faced by farmers. The major effect has been a decrease in incentives to produce for the market. Residents of rural Tanzania receive fewer consumer goods per unit of agricultural output than a decade ago. This is due, in part, to a change in the officially-measured terms of trade between

the agricultural and non-agricultural sectors, as well as to the extreme scarcity of consumer goods in rural areas at official prices, or even at high unofficial market prices. In addition, farmers are less able to store surpluses in the form of valuable assets because of the unavailability of such popular consumer durables as radios, bicycles, and corrugated metal roofing and because of a lack of confidence in cash as a store of value.

The depressed nature of incentives faced by all farmers, partly as a result of the above policies, has encouraged food crop production relative to the production of export crops. More importantly, the marketed output of all agricultural products is lower than it would otherwise have been had farmers' incentives not been altered through government policy.

In Tanzania, separating the agricultural sector from the remainder of the economy would clearly be inappropriate. For this reason, policies which affect the performance of the agricultural sector and the real incomes of different groups are considered in a broader context. Some of these policies are specific to the agricultural sector - others are broader in scope and in some cases, apparently unrelated to agriculture.

Food consumption depends on prices and incomes which largely reflect the structure and performance of the Tanzanian agricultural sector. The agricultural sector's structure and performance are a consequence of the myriad decisions taken by individuals acting both singly and collectively. Examples include the amount of each crop to grow, the allocation of time to collective activities, production for market and for home consumption and to leisure, the choice of technologies, the share of output to sell to the market, the share of household cash income allocated to expenditures on different goods and time and resources allocated to investment in health, education and skills.

It is assumed that in making these decisions, individuals respond in a stable, predictable manner to the structure of incentives which they face. It is, therefore, important to identify those policies which affect the structure of incentives facing farm households. The distortions of the incentives introduced by economic policies have a strong influence on the performance and structure of Tanzanian agriculture and, therefore, have implications for incomes, the cost of food supplies and, of course, food consumption.

The Tanzanian government uses a wide range of economic instruments to achieve its policy goals. Examples include export taxes on certain crops, restrictions on private trade and transport of some crops, imposition of official producer and retail prices, organization of agricultural production, tariff levels and quotas against imported goods, the provision of public services (health, education, roads, railways, extension services), and investment in agricultural research. This entire array of government policies can be viewed as affecting the production and consumption decisions of households. Given the constraints and opportunities implied by this structure of incentives, households choose that mix of production and consumption activities which maximize their welfare.

Changes in the structure of incentives will induce changes in the mix of activities chosen by households, including the level and composition of food consumption. In the next two sections we endeavour to identify the principal elements of economic policies which have shaped the structure of incentives facing the agricultural sector.

2.1.1 Exchange Rate Policy

Tradeable products (both exports and imports) are very important in Tanzania's agriculture. Thus, exchange rate policy can have an important

effect on the structure of incentives facing the agricultural sector. Since the Tanzanian shilling was issued in June 1966, the country has followed a fixed exchange rate policy. Some minor changes in the value were made by altering the gold content of the shilling. Explicit devaluation occurred in 1975 and 1979, and since 1975 a period of managed floating has existed. However, adjustment to the exchange rate has not been an explicit instrument of economic policy. In fact, the explicit policy has been one of adhering to fixed official exchange rates. Some de facto changes occurred as a consequence of pegging the shilling to the US dollar, whose value has varied over time with respect to the currencies of Tanzania's trading partners.

Yet, in Table 1, one is immediately struck by the stable value of the Tanzanian currency at official rates. From 1966 to 1981, the official rate was devalued by a total of 15.4 percent. One model of exchange rate determination is based on the relative rates of inflation between the home country and its trading partners (Purchasing Power Parity Theory). Changes in exchange rates, in this model, are the mechanism whereby equilibrium is restored in the demand for holdings (or stocks) of various assets including foreign and domestic currencies. This model has proved a useful abstraction for understanding movement in exchange rates over relatively long periods. This model performs reasonably well in explaining the official Tanzanian rates until about 1978. Until that time, reported inflation in Tanzania had proceeded at a pace comparable to that measured by the World Bank's Index of International Inflation. Since 1978, however, the Tanzanian inflation rate has accelerated markedly. The index for the first quarter of 1981 was 227. The parallel market rate rose to Tsh 13.50 by the end of 1979 and has risen faster since. This is evidence of the presence of excess demand for foreign exchange at the official rate.

Table 1. Tanzania: Inflation and Exchange Rates

Year	CPI 1975=100	International index of inflation ^b	Official exchange rate ^a	Parallel market rate ^c
1962	40	44		-
1963	39	45	7.14	-
1964	40	45	7.14	-
1965	42	46	7.14	-
1966	44	47	7.14	-
1967	47	47	7.14	8.64
1968	47	47	7.14	8.82
1969	48	48	7.14	8.25
1970	50	52	7.14	9.10
1971	51	55	7.14	10.45
1972	56	60	7.14	15.00
1973	61	72	7.14	15.45
1974	79	89	6.90	13.45
1975	100	100	7.14	14.00
1976	107	101	8.26	25.00
1977	119	109	8.32	20.40
1978	133	124	7.96	15.05
1979	151	142	7.42	11.75
1980	197	159	8.22	13.50
			8.18	-

Sources: IFS, IMF, IBRD, Picks Currency Yearbook.

^aTaken from IFS and IMF data.

^bTaken from IBRD data.

^cTaken from Picks Currency Yearbook.

The pattern of exchange rates, however, cannot be explained solely by this simple purchasing power-parity theory since real as well as monetary influences have been important. Sudden drops in export revenues, tight import controls, fear of nationalization inducing capital outflows, and political and military disturbances in neighboring countries have all affected the parallel market rate. The parallel rate has at times been at least three times the official rate, and for the last decade has been consistently above the official rate.

Overvaluation lowers the price of tradeable goods (both exportables and importables) relative to non-traded goods. This encourages producers to switch resources to the production of non-tradeables, and consumers to demand more traded goods. An inherent imbalance arises which can only be offset (in the absence of a devaluation) by restrictions on imports and by export subsidies. Tanzania has chosen to tax its export sector, and the restrictions on imports have had to be even more stringent in order to ration the scarce foreign exchange.

The overvaluation of the exchange rate has had a profound effect on the performance of Tanzanian agriculture. Overvaluation of between 100 and 200 percent imposes a tax on exports of a magnitude which must inevitably affect the decisions of producers. Producers seeking to evade the increasing tax on export production imposed by the overvalued exchange rate have shifted resources to other activities. As indicated by Table 2, exports have fallen or remained stagnant throughout the 1970s. In contrast the volume of export of major crops nearly doubled in the 1960s, when the overvaluation was not as great and import parity pricing on real terms prevailed. In the 1960s the structure of incentives favored export crop production, even though the

Table 2. Volume of Exports in Tanzania
(1968-70 = 100)

Year	Coffee	Tea	Sisal	Cotton	Cashew
1934-38	31	1	47	16	.
1948-52	31	8	70	15	
1956	46	27	98	47	17
1957	39	30	96	46	35
1958	47	33	104	54	32
1959	41	37	110	52	35
1960	53	44	109	66	38
1961	52	44	106	50	42
1962	54	55	116	55	60
1963	55	56	113	81	45
1964	70	47	110	75	68
1965	59	60	111	93	73
1966	107	89	104	143	81
1967	94	86	106	101	76
1968	103	97	98	105	109
1969	104	105	89	94	91
1970	94	97	112	101	100
1971	74	115	85	91	126
1972	114	126	80	107	126
1973	126	130	60	100	146
1974	85	132	49	83	143
1975	113	142	53	66	117
1976	120	164	47	96	97
1977	98	164	34	68	68
1978	103	152	43	42	58
1979	92	152	40	48	70
1980	104	152	42	68	60

Source: FAO, MDB reports.

marketing boards controlled the prices. Export crop prices were set at export parity net of marketing board and cooperative union expenses. With pricing for tradeables at world market parity, the growing overvaluation of the exchange rate has reduced the real value of agricultural products which are tradeable. This means that the structure of incentives for export crop producers and for producers of maize, wheat and rice has become less favorable as a result of the overvaluation of the exchange rate. Nominal import parity pricing does not transmit the full value of tradeable commodities when the exchange rate is overvalued.

2.1.2 Macroeconomic Policy

The withdrawal of resources from the production of tradeable crops (cash crops for export and food crops as import substitutes) has been reinforced by the growth of the government sector which, as Table 3 indicates, doubled in real terms in the 1970s. As total real income grew modestly in that period, the share of government activity rose from 11 percent in the 1960's to 17 percent in the late 1970's.

Much of this growth in government activity was financed by increasingly large fiscal deficits. The government's account expenditures far outstripped its capacity to raise additional revenue, requiring that the government finance the additional expenditures through borrowing. This has largely taken the form of loans from the Central Bank. The Bank of Tanzania has expanded domestic credit and the monetary base by creating claims on the government and official entities. Between 1978 and 1979 these claims almost doubled, and the money supply rose by 53 percent (Table 4), thus adding fuel to external inflationary influences.

The inflation has further acted as a tax to release real goods and services from households to the government sector. At the same time the

Table 3. Government Sector Expenditures

Year	Government Account	Government Consumption		
	Surplus or Deficit ^a in current prices (million Tsh)	Nominal prices (million Tsh)	Constant 1975 prices (million Tsh)	Percentage of GNP
1966	-	715	1610	10
1967	-	792	1737	11
1968	-	880	1868	11
1969	-412	997	2073	12
1970	-369	1198	2415	13
1971	-688	1344	2630	14
1972	-550	1494	2668	13
1973	-681	1983	3305	14
1974	-851	2494	3153	16
1975	-1865	2882	2882	17
1976	-1805	3989	3728	17
1977	-855	4308	3614	15
1978	-1936	5585	4206	17
1979	-4134	5956	3942	16

Source: IMF.

^a(+) indicates a surplus and (-) a deficit.

Table 4. Changes in the Assets of the Combined Banking System: 1967-1981

Year	Increase in Money Supply ^a (million Tsh)	CPI ^b	Net Foreign Assets (million Tsh)	Claims on Government Sector (million Tsh)	Claims on Official Entities (million Tsh)
1967		46 (4)	+ 87	+ 55	+ 56
1968	+106 (10)	47 (2)	+117	+ 19	+ 99
1969	+622 (55)	48 (2)	+119	+181	+137
1970	+ 9 (1)	50 (4)	- 53	+149	+152
1971	+368 (21)	51 (2)	+136	+210	+120
1972	+242 (11)	56 (10)	+473	+ 33	- 85
1973	+410 (17)	61 (11)	+242	+ 90	+221
1974	+682 (25)	79 (30)	-1023	+828	+1488
1975	+827 (24)	100 (27)	-228	+772	+448
1976	+1048 (24)	107 (7)	+204	+1013	+432
1977	+1051 (20)	119 (11)	+952	-298	+ 58
1978	+489 (8)	133 (12)	-2076	+1848	+1376
1979	+3611 (53)	151 (14)	+198	+3517	+628
1980	+2908 (28)	197 (30)	+ 93	+3036	+507
1981 (I)	-120 (1)	228 (16)	-288	+353	- 97

^aPercentage change given in parentheses.

^b1975 = 100.

Source: International Financial Statistics, IMF.

government has drawn down holdings of international reserves, which as Table 5 indicates are now less than a fifth of their real level in the 1960s. Net foreign assets (which measure both the decrease in the foreign monetary assets of the Central Bank and all increases in foreign liabilities) have fallen precipitously in recent years. Part of the growth in government fiscal deficits and international borrowing was to provide resources for parastatals and other government services in support of the agricultural sector. Through accelerated inflation, however, the government was taking back from the sector some of what it had given through these services. Since government expenditures were being directed primarily at other sectors of the economy, it is probable that through the inflationary tax the government was removing more resources from agriculture than that which it provided in services.

2.1.3 The Development Strategy

As is widely known, the export performance of the agricultural sector deteriorated significantly in the 1970's, with an overall decline in volume of marketed output of approximately 25 percent (50 percent in per capita terms). While this decline in export performance is frequently cited as the basis for a steadily worsening balance of payments crisis, it could also be argued that a capital-intensive industrialization strategy which failed to pay for itself may be the dominant influence in turning the structure of incentives against agriculture and hence to the deterioration of the country's export performance. As will be shown later, the current economic crisis in Tanzania is due more to the capital-based industrialization strategy than to deterioration in the terms of trade or poor weather. The demand for foreign goods and services has risen more than tenfold in the last 15 years, and the real value of the deficit in the trade balance has trebled in the 1970s. These trends are reflected in Table 6.

Table 5. International Reserves:
1966-1981

Year	Nominal (US\$ million)	Constant 1975 Prices (US\$ million)
1966	62	135
1967	61	130
1968	78	166
1969	80	167
1970	65	125
1971	60	109
1972	120	200
1973	145	201
1974	50	56
1975	65	65
1976	112	111
1977	282	259
1978	100	81
1979	68	48
1980	12	7 est.
1981	36	21 est.

Source: IMF.

Table 6. Tanzanian Foreign Trade (In millions of Tanzanian shillings)

Year	Exports	Imports	Trade Balance		As a Percentage of GNP
			Nominal Prices	Constant 1975 Prices	
1962	1043	796	+247	+561	+ 6
1963	1277	808	+469	+1042	+10
1964	1408	879	+529	+1176	+10
1965	1259	1000	+259	+563	+ 5
1966	1678	1284	+394	+838	+ 6
1967	1582	1300	+282	+600	+ 4
1968	1581	1834	-253	-538	- 3
1969	1663	1710	- 47	- 98	- 1
1970	1687	2274	-587	-1129	- 6
1971	1742	2723	-981	-1784	-10
1972	2202	2900	-698	-1163	- 6
1973	2429	3416	-987	-1370	- 8
1974	2868	5377	-2509	-2819	-16
1975	2764	5710	-2946	-2946	-16
1976	4108	5350	-1242	-1230	- 5
1977	4464	6160	-1697	-1557	- 6
1978	3671	8798	-5127	-4135	-16
1979	4484	9073	-4589	-3232	-12
1980	4166	10308	-6142	-3863	-14 (est.)

Source: IMF, International Financial Statistics.

(+) Indicates a Surplus and (-) a deficit.

Perhaps surprisingly, this growth in imports is not attributable to either imports of food or consumer goods. Food imports have been constant in real terms for 15 years, with the exception of 1974 and 1975. The government's development strategy has been to encourage a structural transformation in which such basic industries as iron and steel, cement, and glass were expanded. This has required heavy imports of capital goods whose value trebled in real terms in the 1970s despite the scarcity of foreign exchange (Table 7). The continued emphasis on capital goods has meant that the import of intermediate products and raw materials has been severely curtailed, and has remained virtually constant in real per capita terms. Existing industries have had to operate well below capacity. As a consequence, per capita production of textiles, beer, cigarettes, cement, iron sheets, petroleum, enamelware, blankets, aluminum, and canned meat all fell between 1972 and 1979.

In the last half of the 1970's, capital and intermediate goods have averaged 70 percent of a growing import bill; of these, oil imports have only represented about 15 percent of the import bill. Thus the size and composition of the import bill reveals the capital bias in the development strategy. The value of non-oil imports in capital and intermediate goods represents 94 percent of the average of all export earnings in the last half of the 1970's, and 171 percent of the average export earnings from the four principal export crops -- cotton, coffee, sisal and cashews. This behavior was central to a basic industries strategy which has remained in place throughout the period of the balance of payments crisis.⁴ With the declining export performance, the commitment to meeting the import bill for the basic industries strategy caused shortages of foreign exchange for acquiring inputs necessary to promote agricultural production -- fuel, agrochemicals, spare parts for equipment and processing plants, etc. This further reduced the potential for agricultural

Table 7. Composition of Imports in Constant 1975 Tanzanian Shillings

Year	Food	Other Consumer Goods (Million Tsh)	Intermediate Goods	Capital Goods
1965	302	1026	748	1004
1966	358	1364	1206	689
1967	329	911	1409	819
1968	348	1206	1451	896
1969	308	1029	1448	777
1970	355	973	1767	1294
1971	358	922	2180	1520
1972	593	827	2200	1217
1973	452	1088	2085	1153
1974	1348	987	2497	1227
1975	1011	775	2356	1552
1976	422	245	2316	1650
1977	583	302	2654	2113
1978	450	331	3341	3102
1979	271	250	2872	2995

Sources: 1965 - 1975 World Bank
1976 - 1979 Bank of Tanzania

Converted to constant prices using World Bank's Index of International Commodity Prices.

output and increased the pressures on foreign exchange requirements and hence increased the overvaluation of the Tanzanian shilling.

The combination of reductions in both the real per capita imports of consumer goods and in their domestic output has meant rising real prices of consumer goods. In some cases, prices have exceeded the level at which there is any effective demand and no goods are offered, especially in rural towns and villages. The real price of tires, imported spare parts, tools, and basic farm inputs has risen, reducing the real purchasing power of the farm sector and penalizing agricultural production.

In the period following independence, export crop production rose. This was due to a number of factors: (a) real export parity producer prices for certain crops; (b) lower marketing costs as the transport system improved; (c) stable real prices of basic consumer goods; and (d) reliable access to markets for farm outputs, food purchases, and consumer goods. Since the 1970s, the economic environment has become less favorable. The exchange rate has become increasingly overvalued, implying a tax on export crop production; real prices of farm inputs and consumer goods have risen; access to markets has become less reliable; real transport costs have risen as the roads deteriorated; structural changes in the organization of agricultural production have penalized the output of some plantation products; and real producer prices have fallen.

Many of these changes have their origins in the country's foreign trade and development policies. As export crop production has become increasingly taxed, both explicitly and implicitly, farm households have sought to escape the burden of that tax by shifting resources to other activities. Real export earnings have predictably declined. In addition, the country's dependence on

its traditional exports (cotton, coffee, sisal, cloves, cashew nuts and minerals) has remained unchanged. In the years 1964-66 these commodities earned 73 percent of total export receipts. In the years 1977-79 they still earned 73 percent of export receipts. In 1964-66, total export earnings were Tsh 3,378 million and in 1977-79 they were Tsh 3,370 million, both expressed in constant (1975) command over foreign goods and services. This constitutes a decline of 50 percent in real per capita export earnings. Since a significant share of farm income is derived from export crops, this almost certainly implies a fall in real per capita income in the rural sector. Little evidence exists that per capita rural incomes from other activities have risen by substantially more than 50 percent, which might have compensated for this decline.

2.1.4 Agricultural Policies and Performance of the Sector

During the last 25 years agricultural production has grown at 2.3 percent per year, a rate barely sufficient to match the growth in population. Per capita production from both the agricultural sector as a whole, and food production, in particular, have been virtually static (Table 8).

Overall, the rate of growth of agricultural output slowed in the 1970s compared to the previous decade. This result was consistent with the increasing taxation of agriculture through the monetary and trade policies adopted in the 1970s. With an increasingly unfavorable structure of incentives, there has been little or no change in agricultural productivity. In fact, declining yields are reported for some crops. The demand for technological change has been shifted by the lack of incentives for innovation. Consequently, real investment in agricultural research, teaching, and extension has fallen.

As a consequence of both macroeconomic and trade policies which discouraged export production, and the change in relative prices, the performance of

Table 8. Tanzania Indices of Production 1956-1980
1969-1971 = 100

Year	Total			Per Capita	
	Agriculture	Crops	Food	Agricultural	Food
1956	72	73	76	105	110
1957	72	73	77	104	109
1958	80	82	83	113	114
1959	81	83	87	112	117
1960	73	72	73	99	97
1961	73	71	75	96	98
1962	77	76	78	99	98
1963	84	85	85	105	105
1964	86	88	85	105	103
1965	86	86	85	103	100
1966	112	103	98	116	112
1967	93	92	89	101	100
1968	96	95	93	102	101
1969	98	96	94	101	100
1970	101	97	103	102	103
1971	104	106	106	102	103
1972	107	109	109	101	103
1973	110	112	112	101	103
1974	106	108	111	94	99
1975	123	122	135	106	117
1976	125	124	138	105	115
1977	125	122	139	102	113
1978	130	128	146	103	115
1979	128	124	143	98	109
1980	128	123	141	95	105

Source: USDA.

the export sector has been predictably disappointing. As shown in Table 9, with the exception of tea and tobacco, the output of all principal export crops fell in the 1970s. The average decline (weighted by trade shares) was 21 percent. This is an important outcome, for it emphasizes the highly responsive nature of export supplies. It has frequently been argued that agricultural production is not very responsive to incentives. Peasant producers have been seen as traditionalists, satisfying their subsistence needs and selling only enough to generate cash income sufficient to purchase some minimal level of basic consumer goods. The evidence in Tanzania strongly supports the contrary view. The response to changing real price levels for export crop production has been marked. The real unit prices paid to producers for the two major export crops were reduced throughout the 1970s, especially in the second half of the decade. The real unit price received by coffee growers fell by 50 percent, and that received by cotton producers by 20 percent (see Table 10). This occurred in a period of a general upward trend in real prices for coffee in international markets and near constant real prices for cotton. The absolute tax on export crops rose substantially in the latter half of the 1970s as the rise in international prices was not passed on to producers.

As a consequence of improved unit export prices, Tanzania's export earnings have remained constant for the last 15 years. Table 11 implies a drop of more than 50 percent in the per capita command over foreign goods and services. In a period when international prices were on average increasing for Tanzanian exports, farmers were receiving lower real prices.

While the explicit and implicit rate of taxation of export crops has been increasing, the exchange rate overvaluation and inflation have been indirectly taxing the production of food crops. A policy of import parity pricing has

Table 9. Tanzania: Output of Major Export Crops

	Real 1980 Producer Price ^a	1970 ^b	1975	1977	1980
<u>Declining</u>					
Cotton	AR 74 Br 69	100 (13)	92	88	79
Sisal		100 (11)	70	58	45
Cashew	59	100 (7)	105	87	60
Pyrethrum	58	100 (1)	205	141	61 ^c
<u>Constant</u>					
Coffee	43	100 (17)	109	98	96
<u>Increasing</u>					
Tea	83	100 (3)	153	197	225
Tobacco	52	100 (2)	117	160	218

Sources: Bank of Tanzania
USDA, MOB

^a1970 = 100.

^bPercentage of export earnings in 1970 given in parentheses.

^cFor 1979.

Table 9a. Rates of Agricultural Growth in Percentages

Period	Annual Average Rates of Growth		
	Agricultural	Crops	Food
1960 - 1969	3.0	2.8	2.5
1970 - 1980	2.2	2.2	2.9

Table 10. Unit Export Price
(1970 = 100)

Year	Coffee Unit Export Price ^a		Producer ^b Price	Cotton Unit Export Price ^a		Producer ^b Price
	Nominal	Real		Nominal	Real	
1969	75	82	102	102	111	107
1970	100	100	100	100	100	100
1971	92	87	101	110	104	101
1972	101	88	106	127	110	95
1973	118	86	102	134	97	89
1974	131	77	69	227	113	89
1975	127	66	105	197	103	92
1976	318	164	151	273	141	87
1977	612	291	93	340	162	89
1978	367	154	67	279	117	84
1979	384	141	59	310	114	96
1980	313	102	45	192	63	74

Source: IMF; MDB

^aDeflated by Index of International Inflation (IBRD)

^bDeflated by CPI for Tanzania.

Table 11. Real Value of Export Earnings in Millions of
Constant 1975 Tanzanian Shillings

Year	Cotton	Coffee	Sisal	Cashew	Total Main Crops	All Exports
1965	530	374	641	179	1724	2954
1970	475	600	344	262	1681	3171
1973	463	688	308	242	1701	3348
1975	297	483	302	221	1303	2589
1977	496	1704	209	250	2659	4146
1979	346	856	183	102	1487	3158

Source: Bank of Tanzania.

raised the nominal price of food grains. This is believed to have been induced by the food shortage years of 1974 and 1975. It is not clear that the rise in official prices has induced any more production of grains, for if parallel market prices for grains (which in part reflect the opportunity for illegal exports) have been rising faster than official prices, then the amounts of food crops offered to official markets are likely to fall. Evidence presented in the next chapter suggests that international prices are reflected in producers' decisions to sell to official channels; thus exchange rate overvaluation and inflation (measured and repressed) are eroding the incentive value of higher nominal official prices for grains. The next section discusses the probable resource allocation effects induced by changes in the structure of incentives of cash crops relative to food crops.

2.1.5 Resource Allocation Between Cash and Food Crops

Producers in Tanzanian agriculture make a series of complex decisions each year concerning what, when, and how much to plant, what inputs to purchase, and how to use their labor at different times of the year. The result of these decisions, together with climatic and other conditions, is the farmer's annual harvest. The harvest must provide enough food for the household, or be exchanged for that food. In addition, the production may be exchanged for consumer or capital goods. Factors which govern the terms under which farmers can exchange agricultural products for subsistence needs and for non-agricultural goods and services have had a substantial effect on farmers' decisions, and thus on the level and composition of Tanzanian agricultural output. The major effect has been a decrease in incentives to produce either cash or food crops for the market. The above effects have generally depressed the level of agricultural output from what it might have been under a more favorable structure of incentives. As well as affecting the level of output,

the conditions perceived by farmers seem to have encouraged food crops relative to cash crops. The weighted average of official prices of cash crops, adjusted for officially-measured inflation, fell 24.5 percent from 1970-71 to 1980-81 while those of preferred staples and drought staples rose by 1.4 and 13.3 percent, respectively. Because measured inflation has been repressed (i.e., consumer goods have been unavailable in rural areas), it is doubtful that the real purchasing power of officially marketed maize (a preferred staple) has risen. These figures underestimate the change in relative prices, however, because the price farmers can receive for an additional unit of food crops is often the parallel market price, which is generally much higher than the official price.

While at the national level there exists no trade-off between cash and food crop production (because more of each could be produced), individual farmers have faced a situation where cash crops cannot be exchanged for non-agricultural goods nor for food at reasonable prices. Farmers who grow cash crops with the expectation of exchanging part of their earnings for their families' food supplies find that they face high parallel market prices. They also may not be able to buy grain at all in very poor years. This causes the farmer to grow more food crops when there are competing demands for his scarce planting, weeding, and harvesting labor. In this manner, traditional cash crop producers have been driven into subsistence production.

This section examines government policies and other factors which have affected the structure of incentives to cash crop producers. It will be shown that returns to cash crop production have remained static or fallen, while the value of these products has been rising on world markets. Further, cash crop production has become increasingly less attractive than food production.

2.1.5.1 The Pricing Process. In general, official price recommendations for export crops are based on the concept of export parity pricing. Thus, producer prices are calculated by subtracting unit marketing cost from the world market prices expected to prevail in the forthcoming year.* This concept embodies a set of assumptions concerning the optimal allocation of resources given world market conditions; that is, rising world market prices should lead to increased remuneration for farmers and reallocation of land, labor, and capital to those crops for which market prospects are favorable.

An important limitation of parity pricing of traditional export crops is the use of the overvalued official exchange rate to determine export parity. The parity-derived valuation of export crops is understated to the extent that the official exchange rate does not reflect the true value of the Tanzanian shilling vis-a-vis the value of the currencies of Tanzania's trading partners. As such, the maintenance of an artificially high exchange rate imposes an implicit tax on the export crop sector in the form of lower real returns to growers. Thus, overvaluation of the exchange rate undervalues each unit of export crop produced.

2.1.5.2 Rising Marketing Costs. In order for the pricing to transmit the appropriate signals, it is necessary that real marketing costs remain relatively stable vis-a-vis the real services which the marketing institution performs for the farmers. In Tanzania, this has not been the case. The problem of rising unit marketing costs has persistently plagued the institutions charged with marketing agricultural products. As early as 1966,

*This is not true for coffee, for which payment of growers is a two stage process. Upon delivery of coffee to Coffee Authority of Tanzania (CAT); an advance is paid to farmers; the final payment is made after the actual auction takes place. Essentially, this system has evolved in response to the rapid fluctuations of world coffee prices.

a committee of inquiry commissioned by the President's office cited the co-operatives' inability to contain rising marketing cost as one of their major flaws.⁵ A decade later, the entire marketing function was turned over to parastatal crop authorities, largely as an attempt to reverse the trend of rising marketing costs by "streamlining" the marketing services provided to farmers.⁶ Despite recognition of this problem, marketing costs have continued to increase. A comparison of producer prices to world market prices indicates that with the exception of tea,* unit export values experienced a much greater increase than producer prices.

As Table 12 indicates, world market conditions in the 1970's appear to have been generally favorable, yet producer price increases in no way kept pace with increases in external prices. This is a direct result of the pricing mechanism. Marketing costs of the responsible institutions have absorbed a progressively larger share of the product of growers' cultivation. This process in which marketing institutions obtained more and more of the revenues of their industry is further substantiated by examination of the change in growers' shares of realized value of selected export crops (Table 13).

Conspicuous by its absence from Tables 12 and 13 is coffee. This is not because the phenomenon of declining growers' share of the average export value for the crop is insignificant. Over the period 1970-1979, nominal world coffee prices rose by 267 percent while nominal producer prices grew by only 120 percent.⁷ Furthermore, over the same period the ratio of producer prices to world prices fell by over 43 percent.⁸ Where coffee differs from the other crops cited in the two tables is that a more important cause of

*With regard to tea, producer prices were boosted by 67 percent following an international boom year in 1976. The boom proved to be short-lived, however, and was followed by a collapse in world tea prices.

Table 12. Percentage Changes in Producer Prices and Unit Export Values, 1970 to 1979

Crop	Producer Price*	Unit Export Value*
Cashew	80	256
Cotton	117	228
Tobacco	71	158
Pyrethrum	63	97
Tea	139	84

*Using nominal prices.

Source: Ellis, Effects of Agricultural Pricing Policy, 1970-79.

Table 13. Ratio of Producer Price to World Market Price*

Crop	1970-71	1978-79	Percentage Change
Cashew	.695	.352	-49.4
Cotton	.260	.172	-33.8
Tobacco	.654	.413	-36.9
Pyrethrum	.022	.018	-18.2
Tea	.076	.098	+28.9

*Producer prices are for buying season (July-June). The world prices are for the calendar year.

Source: Ellis, Effects of Agricultural Pricing Policy, 1970-79.

declining producer prices vis-a-vis the world coffee price has been the staggering increase in export taxes that was levied against growers. The formula for assessment of the tax was developed in the early 1960's and was based on world prices then in existence. Over time, world coffee prices rose, yet the tax structure remained largely unchanged.* Thus, while the ratio of tax revenue to total export earnings averaged 10 percent between 1965 and 1971, the ratio rose steeply beginning in 1972 (Table 14) to over 30 percent in each of the last five years.

The analysis which Ellis presents is in nominal terms. The percentage growth rates of the official prices and unit export values make the parastatals appear as villains in Tanzania's agricultural pricing, taking an ever-increasing bite. However, a somewhat different perspective is given by looking at absolute values expressed in real terms. Figure 1 is a graphic illustration of how the components of the marketing cost structure changed in the 1970s. Real producer prices were virtually the same in 1970-71 and 1979-80 while real world market prices for coffee nearly doubled. Export taxes levied against producers increased by 464 percent while marketing costs jumped by 136 percent. It is important to stress that in both seasons the largest of the "bites" was the implicit tax resulting from overvaluation of the Tanzanian shilling.

The export tax on coffee was finally abolished earlier this year in an attempt to stimulate production by boosting producer prices. There are, however, several factors which will, in all likelihood, diminish this desired effect. First, the Coffee Authority is behind in its payments to coffee

*Coffee export tax rates were amended in June 1979. In the revised tax regime the auction prices remained the basis for tax assessment, but the threshold at which the marginal rates were applied was raised slightly.

Table 14. Ratio of Coffee Export Tax Revenues to
Coffee Export Earnings

Year	Tax revenue (Million Tshs)	Export earnings (Million Tshs.)	Ratio (%)
1965	13.3	221	7.7
1966	28.3	172	16.5
1967	22.2	303	7.3
1968	26.1	239	10.9
1969	27.8	265	10.5
1970	24.4	257	9.5
1971	25.4	312	8.1
1972	32.0	227	14.1
1973	78.9	383	20.6
1974	112.3	495	22.7
1975	58.2	375	15.5
1976	168.1	485	34.2
1977	782.0	1283	61.0
1978	551.0	1315	41.9
1979	397.3	1042	38.1
1980	456.4	1327	34.2

*Projected.

Source: MDB, The Coffee Marketing System.

Figure 1.

COFFEE

(Constant 1975 Tsh)

PRICE

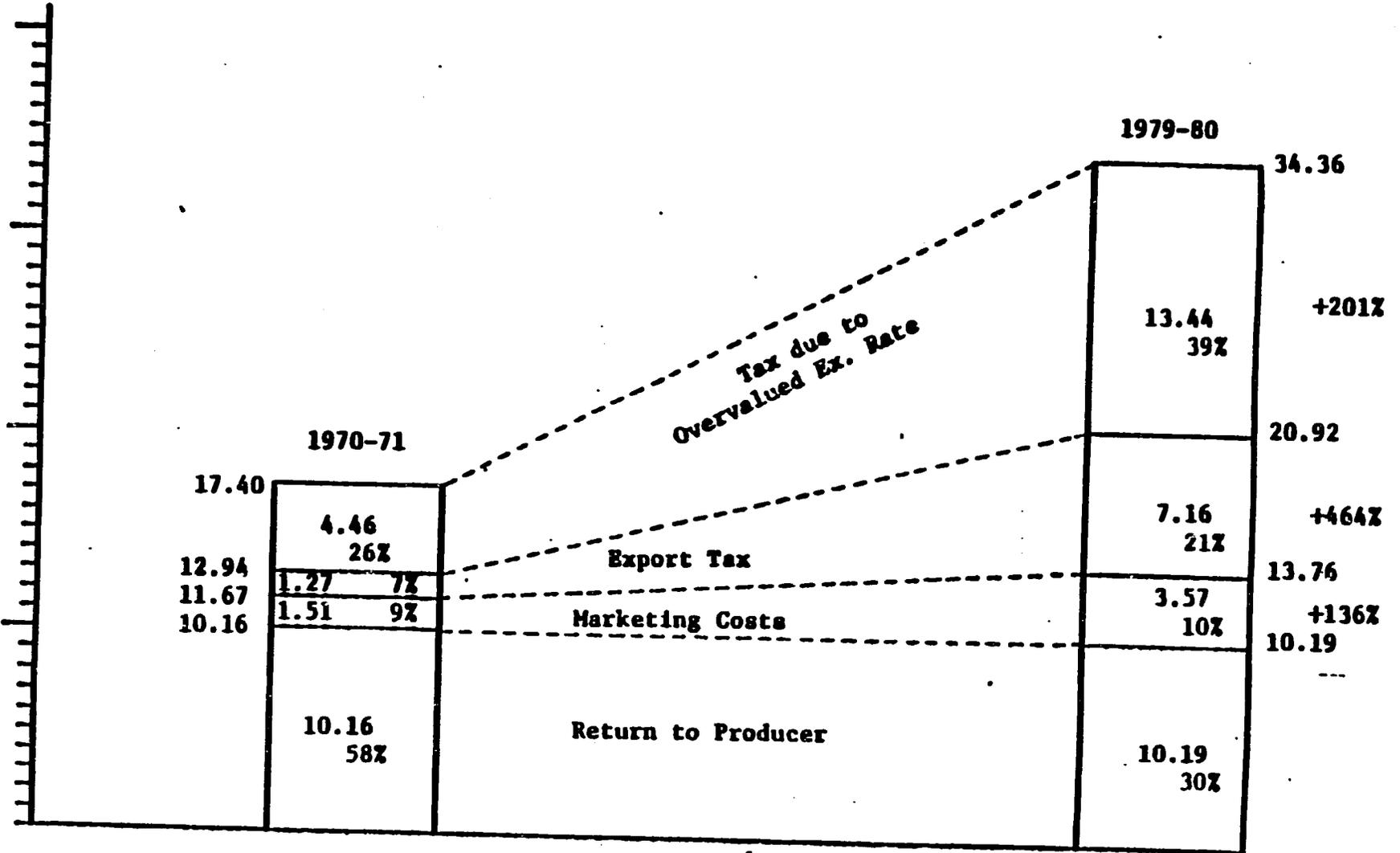
Tsh/kg

40

30

20

10



Source: Sigma One Corp.

growers. Some farmers are still awaiting payment for the 1978-79 season. Since the abolition of the export tax was not retroactive, the effects of the recent action will not be felt until such time as the Coffee Authority is caught up with its backlog of outstanding debts to farmers. The other factor which will mitigate the positive effects of the abolishment of the export tax is the unfavorable movement of world coffee prices. Record harvests worldwide (and most importantly, in Brazil and Colombia) have caused prices to plummet. Thus, while removal of the export tax will increase the ratio of producer prices to export prices, producer prices per se may not be raised.

It is conventional economic wisdom that given a certain level of fixed costs, the unit cost of marketing any good is inversely correlated with the volume of the good handled. With regard to the marketing system in Tanzania, this simple fact of economic life has worked against the export crop authorities in two ways. First, fixed costs have soared with the expansion of functions which they are expected to perform. New branch offices had to be established, more staff hired to administer the system, trucks bought for transport, extension agents hired, and so on. Second, export crop production has declined over the past decade.

Significantly, part of the decline in smallholder production of export crops is attributable to the performance of the parastatals themselves. A particularly critical problem in this regard is that of late payment and procurement of crops. This is especially relevant to the coffee and cotton authorities. As of June 1981, an estimated 8.5 million kilograms of seed cotton grown in the 1979-80 season had not yet been collected in the major cotton growing areas.⁹ Aside from cash-flow problems for farmers, this has also severely taxed the limited storage facilities of villages.

Aside from those elements of parastatals' operating costs which are by-products of the policy framework under which they operate (i.e., the expansion of functions they are required to perform), phenomena such as poor accounting practices, inadequate administration and supervision, stock losses, misuse of resources, and corruption have served to inflate parastatals' overall costs. All this feeds back into the price-determination process and limits the potential for raising producer prices.

The effects of the mutually reinforcing phenomena of increased overhead and declining production have nullified the predictions that crop authorities, by handling larger amounts of produce than the former cooperative unions, would benefit from economies of scale. Although this notion appeared sound on paper, scale economies have not occurred in practice. Indeed, the bureaucracies necessarily involved in the operation of the present system appear to pose a fundamental diseconomy.

Tanzania is a large country with widely dispersed agro-climatic zones and a poorly developed transportation infrastructure. It is in this context that crop authorities have found themselves in the position of having to control all aspects of production and marketing of specific crops which are grown in scattered pockets of the country. By centralizing the administration of these parastatals, a host of difficulties in transport, coordination of activities, and monitoring of stocks, have inevitably arisen. The physical separation of the various levels of parastatal management has allowed greater opportunities for corruption and misuse of resources, as well as making the implementation of government policy more difficult. Ironically, these are precisely the problems which the establishment of the present system sought to eliminate.

Despite suffering from many of the same problems as those plaguing the crop authorities, the cooperative system did provide for a certain degree of

constraint on the growth of unit marketing costs.¹⁰ Primary societies and unions were paid a fixed levy per ton of produce handled, the amount of which was approved by the Cooperative Union of Tanzania. This established a definite upper limit on the unit cost of getting the crop from the farmer to the market board go-down. If this limit was exceeded, farmers had the right to take any action necessary to bring marketing costs back within these limits (although this right was frequently not exercised).

The present system contains no such restraint. Each crop authority holds a virtual monopoly over all activities related to its specific crop. Moreover, there is a great deal of autonomy given to those individuals charged with carrying out the various marketing functions. Given the generally poor quality of accounting in the parastatal sector, this has meant that individual inefficiencies have often gone unnoticed by top management, not by farmers; the cumulative effects of these individual inefficiencies has, more often than not, added up to poor overall performance.

In short, the present system is too big and too unwieldy given the human resources available. Those most directly affected--smallholder farmers--have no apparent recourse but to move more in the direction of food crop production for market or subsistence and/or to seek out alternative (i.e., illegal) marketing channels.

2.1.5.3 An Illustration: Cotton and Food Crops. In this generally depressed environment of deteriorating incentives, the relative attractiveness to farmers of food crops and cash crops can be illustrated by an examination of parameters affecting farmers' decisions on growing cotton. Cotton is currently Tanzania's second most important source of agriculturally-based foreign exchange earnings. Production of cotton has declined since the early

1970's and recent efforts to expand cotton-growing into new areas of the country have failed to increase overall production. Understanding the disappointing performance of the cotton sector requires understanding the reasons for its decline in traditional areas and the difficulties of programs to expand production into promising new areas.

Cotton has traditionally been grown in the regions surrounding Lake Victoria--Mwanza, Mara, and Shinyanga. Production expanded rapidly during the 1950s and 1960s; per capita output of seed cotton in Mwanza rose from 42 kilos per capita per year in 1953 to about 100 kilos in the middle 1960s. It then declined to 77 kilos per capita in 1970 and dropped to 42 kilos in 1977, the same level as a quarter of a century before.¹¹ Nationwide production in 1980-81 was only 78 percent of output a decade earlier, despite high population growth.

Several factors encouraged the growth of cotton production during the 1950s and 1960s. These included: (1) favorable price of cotton relative to other crops, (2) improvements in food production technology that released land and labor for cotton, (3) increases in cotton yield due to improved varieties, (4) the success of political and extension campaigns promoting cotton cultivation, and (5) the introduction of ox plows, which made cotton cultivation possible in the fertile clay soils of southern Sukumaland.¹²

The first four trends were reversed in the Lake Victoria regions after 1970. The official price of cotton in 1970 was 4.07 times the official price of maize; in 1977 the ratio was only 2.54. Although cotton price increases caused the relative price to increase in 1980 to 3.2, official prices still made cotton less attractive to farmers over the decade.¹³

Moreover, the increasing importance of parallel markets for grain have made a drastic difference in the returns farmers can expect for food crops relative to cotton. The average price for maize in four cotton-growing villages in Mwanza region in 1980-81 was Tsh 5.50, 550 percent of the official NMC purchase price, making the cotton/maize price ratio only 0.58. In the same year, the official cotton/cassava price ratio was 4.9, but in the village unofficial markets the ratio was 1.13.

The relative attractiveness of cotton and food crops to smallholders can also be demonstrated by the difference in returns to land and labor in Wigo, a village in Geita, Mwanza, in 1978-79. Cotton brought Tsh 1290 per hectare, while maize/legume mixtures brought Tsh 1706 per hectare if sold at official prices, or Tsh 2280 per hectare if sold at the unofficial prices pertaining in Wigo. Thus, food crops yielded 32 percent more per hectare than cotton at official prices and 77 percent more if food crops were sold on parallel markets.¹⁴ The differences in returns to labor are even more dramatic. Cotton farmers ended up with Tsh 1.50 per hour while food crops returned Tsh 2.81 per hour (87 percent greater than cotton) at official prices and 4.10 per hour (173 percent of cotton) on parallel markets. It should be noted that if cotton farmers depend on using cash from cotton sales to buy food, it is highly probable that they face the parallel market price, as few, if any, have access to officially marketed maize.

The entire Lake Region has experienced rapid population growth over the past decade, placing greater pressure on the ability of the land to produce food. The city of Mwanza has grown tremendously and exerts a significant economic influence over the entire region. Unlike Dar es Salaam, Mwanza's

burgeoning population cannot depend on the National Milling Corporation to supply food. Grain flows to Mwanza from all directions; the city's demand raises unofficial producer prices for food crops. In many rural areas population growth has reduced the available land per person.¹⁵ Because the NMC cannot be depended upon to sell food and the major parallel market flows go to Mwanza or the regional capitals, farmers cannot count on meeting their families' food requirements with cash earned from cotton sales. They have to grow enough food to ensure survival before even thinking about cash income. The average area cultivated per family in Mwanza, for instance, has decreased from 3.09 hectares in 1966 to 2.67 in 1977 due to population pressure. As a result, the average area per cotton holding decreased from 1.35 hectares in 1966 to 0.93 in 1977. Moreover, population pressures have had a direct negative impact on soil fertility (and thus on yields) as farmers can no longer fallow individual shambas as often, or for as long, as is necessary to restore the soil.

Many parts of Kigoma, a relatively undeveloped region along Lake Tanganyika, were considered by regional development authorities to be suitable for growing cotton. The Regional Development Council made it mandatory for each household to grow a minimum of one acre of cotton. This explicit policy, however, was controverted by the development of a food crop marketing infrastructure after villagization and the institution of an official price of Tsh 3.50 for beans in 1977/78. The overwhelming majority of the farmers found it vastly more profitable, and less physically taxing, to grow maize and beans.

To avoid prosecution by regional authorities, farmers would plant cotton seed on one acre and then ignore the crop completely while devoting their ef-

forts to food crops, often not bothering even to harvest the cotton. The economic information transmitted to farmers by government policy (i.e., maize/beans mixtures have higher returns to land and labor than does cotton) was more important in their decision-making processes than the political directive to grow cotton.¹⁶

Finally, there appears to be widespread dissatisfaction among cotton farmers with the service provided by the Tanzania Cotton Authority (TCA).¹⁷ Mention has already been made of the long delays in procurement from villages by the TCA. This further reduces the real return to cotton farmers, as the delays in payment represent real costs (in the form of cash-flow difficulties) which they must bear. In addition, there is growing evidence that some TCA agents have been involved in under-weighing and even pilfering of seed cotton. This, too, has an effect on the willingness of farmers to grow cotton.

2.1.5.4 Domestic Resource Costs. This allocation of resources to food crop production in traditional cotton areas is coming at the expense of economic efficiency, i.e., higher real costs for food. This can be demonstrated by analyzing the domestic resource costs of producing cotton and maize. Domestic resource costs (DRC) measure the monetary value of domestic resources used to produce a foreign exchange earnings or savings for a given tradeable commodity. When the DRC is compared with the real exchange rate, a measure of comparative advantage in producing a particular commodity is obtained. If the DRC coefficient is less than the real exchange rate, a comparative advantage exists; if it is greater than the real exchange rate, a comparative disadvantage exists. From Table 15, it can be seen that cotton, the export crop, has a significant comparative advantage relative to maize, an import substi-

tute, at any given value of the shadow exchange rate. Furthermore, if the shilling is overvalued by more than 50 percent, Tanzania has a comparative advantage in producing both cotton and maize.

It seems clear, however, that in the absence of the distortions to the structure of incentives certain regions would tend to specialize to cotton production and others to maize. Figure 2 shows the major officially marketed agricultural products by region. The net effect of this market-induced specialization would be to lower the cost of maize to rural households. This result would require a flexible and efficient grain marketing system.

2.2.1 Food Policy Issues

In Tanzania, the apparent behavior is that farm households are being induced by policy to plant food crops first and are then allocating resources to cash cropping and other productive activities. This apparent behavior has been identified by some analysts as a "Food-First Strategy" towards development. "Food First" was not, however, an explicit goal of Tanzania's development strategy. The agricultural sector had to produce more of both food and exportables. In per capita terms it is producing less for export, and food crops are being produced at higher real resource costs since more labor and land are being used to meet farmers' food needs. It will be shown in the next chapter that the impact of agricultural pricing policies have tended to amplify the price and weather induced disturbances in official grain markets. These policies have made domestic grain markets more unstable than international grain markets, a result which is directly counter to the food security arguments for a "food first" policy. Tanzania has attempted to provide support for increased domestic food production through a variety of institutions.

Figure 2.

Major Marketed Agricultural Products by Region

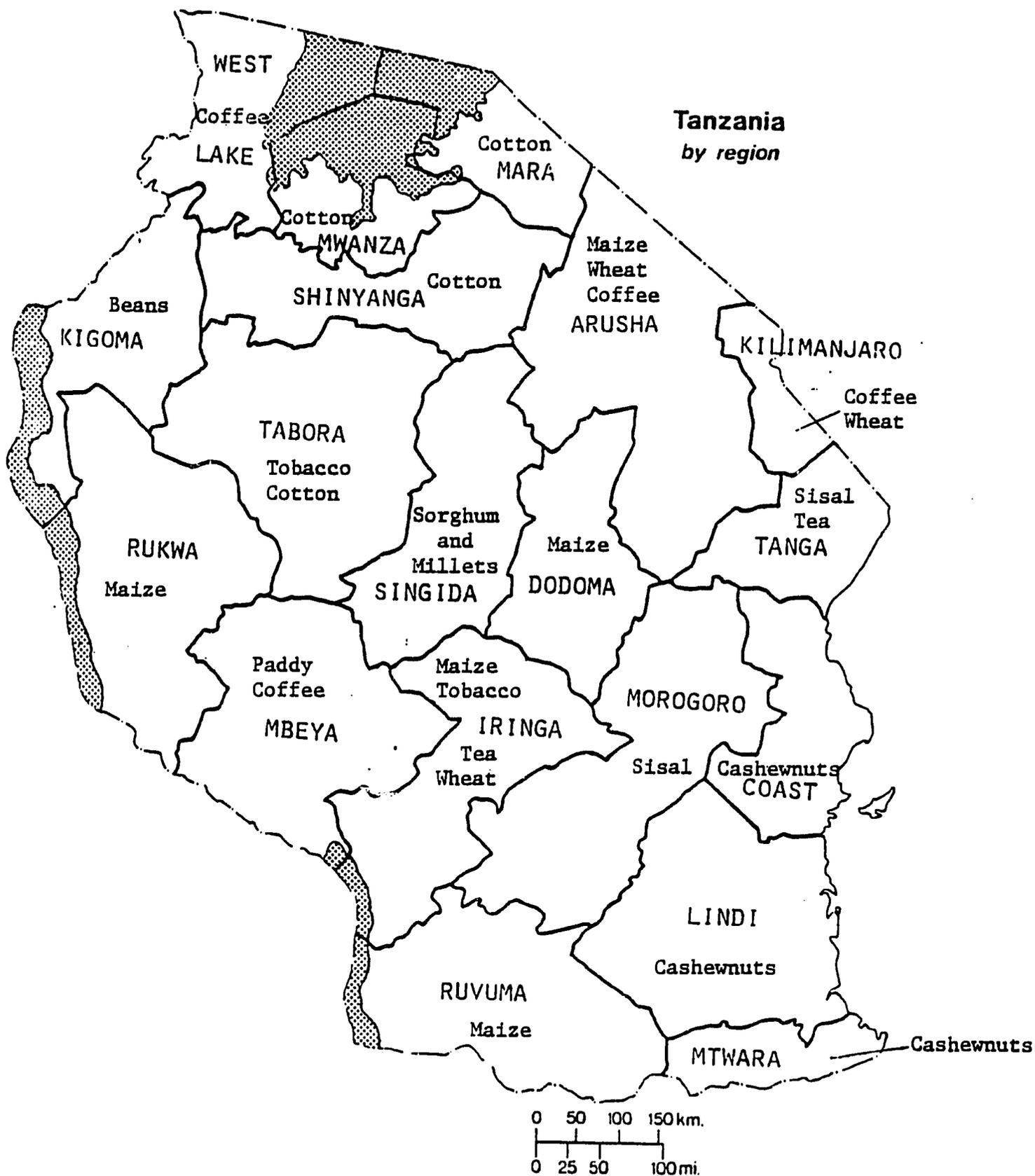


Table 15. Domestic Resource Costs for Cotton and Maize
1980/81 (Tsh/\$)

	Cotton		Maize (traditional small holder)
	Traditional small holder	Modern farming	
Coast	4.04	3.90	--
Kigoma	4.55	4.34	13.64
Kilimanjaro	4.36	4.04	8.58
Kagera	4.55	4.36	13.27
Mara	4.53	3.77	12.39
Mbeya	4.42	4.14	9.85
Morogoro	4.29	3.94	7.51
Mwanza	4.50	4.27	11.30
Shinyanga	4.63	4.16	10.03
Singida	4.39	4.09	9.10
Tabora	4.46	4.21	10.42
Tanga	4.25	3.88	7.94
Arusha	--	--	7.10 ^a
Dodoma	--	--	8.28
Iringa	--	--	6.71 ^a
Lindi	--	--	8.23
Mtwara	--	--	8.57
Rukwa	--	--	12.95 ^a
Ruvuma	--	--	8.26 ^a

^aYield assumed to be 25 percent greater than the average yield in other regions.

Source: Sigma One Corp.

2.2.2 Institutional Promotion of Food Crops

The government has attempted to increase food production through various kinds of institutional support. There has been continued support for extension in the Ministry of Agriculture. The National Maize Program (NMP) has sought to bring together improved agronomic practices, purchased inputs, and extension support in order to increase maize production. The program has had mixed results. In Iringa and Morogoro there have been reports that yield increases from following NMP recommendations have not even been sufficient to recover the cost of purchased inputs. In areas with superior climate and soils like Rukwa, Ruvuma, and Mbeya, it appears that some of the credit for large output increases (also due to the provision of a guaranteed market) goes to improvements from the NMP. Throughout the country, the extension agents have been recommending block farming and monoculture for maize; research results, however, have begun to corroborate farmers' contentions that mixed cropping provides risk insurance with little or no sacrifice in yields. This recommendation has caused extension agents to lose credibility with farmers.

The Tanzania Rural Development Bank (TRDB) has sought to provide inputs on credit to Tanzanian farmers. Besides an overall shortage of inputs, there have been problems with the program. Some farmers have been lent money for fertilizer only for cash crops (mainly tobacco) when they wished to use it on other crops. In addition, farmers have been unable to buy inputs with cash savings, and not all farmers qualify for loans. Furthermore, TRDB lending to farmers has been crowded out by parastatal borrowing.

Regional integrated development programs (RIDEPs), sponsored by regional and national government and by aid from various nations, have attempted to provide resources and planning for rural development. RIDEPs vary greatly from region to region, and no blanket evaluation of their impacts on food produc-

tion and distribution is possible. The impact of even the best of these programs has been reduced by the lack of incentives for farmers to produce for the market.

2.2.3 Food Security

Variations in rainfall have been cited as the primary cause of the instability of Tanzanian food supplies. Most regions of the country experience years of low rainfall serious enough to have a definite impact on crop production. When many regions experience poor weather in the same year, as in 1973-74, there is indeed a threat to food security. It is not the weather alone which causes this instability and insecurity. The way in which the system of agricultural markets reacts to these production downturns exacerbates the fluctuations in supplies reaching different segments of the population.

Farm families that produce their own food can stabilize their consumption by saving surpluses from good years in the form of assets, and converting these assets to food on the market in bad years. This is not a viable option for many because of the unreliability of grain markets in most rural areas. In addition, cash is a poor store of value due to the high rate of inflation, and durable goods such as radios and bicycles, which might be used as stores of wealth, have been in very short supply.

It is the security of food supplies to the urban population which has been a major problem and a preoccupation of government policy. When output declines on a farm, the farm family will probably keep its own consumption fairly constant and reduce the marketed surplus. Thus the food reaching markets will fluctuate more than overall production. Tanzania has a system of dual markets -- official and unofficial -- which compete for marketed grain.

Because prices on unofficial markets can rise in reaction to scarcity and the official price cannot, the unofficial markets handle a higher percentage of grain in bad years. All of this causes further reduction in official supplies available to urban dwellers who are dependent on markets, increasing the government's need to maintain and draw down reserves or to acquire grain on the international market.

3. THE MARKETS FOR GRAINS

Each farmer growing food crops in Tanzania must allocate his harvest between his own consumption (including his seed and animal feed needs), the NMC, and other markets. The great majority of grain production in Tanzania is, and has always been, consumed by the producing household. Of the marketed portion, a significant amount is sold locally. Some grain finds its way to market-dependent consumers in nearby district and regional centers through unofficial channels. Only a small percentage of the harvest is transported across regional boundaries for sale. This type of marketing occurs both legally and illegally. The farmer's decision will depend on his own family's food needs, the prices he faces in different markets, his ease of access, and his perception of risk.

Tanzanian agriculture is susceptible to wide fluctuations in output due to annual variations in rainfall. It is important to consider how the parameters affecting the allocation decision are influenced by these fluctuations. It has been suggested that Tanzanian farmers oriented toward subsistence maintain relatively constant consumption in the face of output increases or declines, varying instead the marketed share of output.¹ Although the farmer's planting and labor decisions, and thus gross output levels, may be influenced by expected prices and other factors, at the time of the harvest, farmers first retain enough for consumption needs and market what is perceived as a residual.

Various estimates have been made of how large a share of total output is marketed. Lele and Chandler have guessed 20 percent.² Tanzanian Food and Nutrition Center's data, based on official estimates, show marketed portions

of the three preferred staples varying from 19 percent in 1973-74 and 1974-75 to 23 percent in 1975-76 and 14 percent in 1976-77.³ Loft and Oldevelt's study of farmers from eight Kigoma villages for 1978 shows that 13 percent of the overall maize harvest was marketed.⁴ Using farm sales and production data, Oates estimated that 12 percent of cereal production was marketed in Lindi Region in 1979-80.⁵ The low estimates for Kigoma and Lindi are not inconsistent with higher estimates for Tanzania as a whole, as neither is traditionally a surplus area. In view of this evidence, a nationwide estimate of 20 percent in the average crop year seems reasonable. The following sections describe the distribution of the marketed surplus of staple grains between official and unofficial markets.

3.1 The Official Market

The National Milling Corporation (NMC) was established in 1968 as a manufacturer and processor of agricultural products. In 1975 these functions were expanded to include procurement, transport, and storage of all grains and staples offered for sale by farmers--functions which had previously been undertaken by the National Agricultural Products Board. With the abolition of cooperative unions in 1976, NMC became responsible for direct acquisition of crops from the villages.

Despite wording in NMC's legislative mandate that requires it to operate as a normal commercial undertaking, NMC has been repeatedly called upon to operate as a means of government distribution and redistribution of income. Some of the sources of financial loss which result from the institutional arrangements under which NMC operates include the sembe (maize flour) subsidy, the transport subsidy, and the requirement that it purchase all stock offered for sale. Other such policy-derived sources of loss accruing to NMC include the provision of food to the army during the war with Uganda (and subsequent

food aid to Uganda), the outstanding debt charged to the Prime Minister's office for famine relief (on which NMC pays interest), and operation of the Strategic Grain Reserve.

In addition to the above, the financial performance of the NMC has been hurt by certain internal operational policies. Three of these are of interest here. First, there is a perceived need to procure crops as early as possible, presumably due to the inadequacy of storage facilities at village assembly points. In order to facilitate early collection, NMC's overhead base has expanded enormously and continues to increase out of proportion to the amount of produce handled. Transport has often been dispatched with undue haste and improper planning, with partially empty lorries hauling goods at high per unit costs. With increased staffing levels, expenditures on housing and such amenities as the use of staff vehicles have grown out of hand.

The second internal policy of interest here is that of paying villages in advance of crop collection. NMC is the only crop parastatal which does this. It is believed that this encourages farmers to market the produce officially. The advance payments to villages are based on village estimates made prior to harvest. In many cases there is an overestimation of what will be supplied, and at the end of the season the outstanding advances are not recovered. In a sense, the NMC is powerless to act on this as it is thought that attempts to recoup this money would cause farmers to sell more of their crops unofficially. At any rate, whether or not there is overestimation, NMC pays interest on the amounts forwarded (as part of its overdraft), while no interest is charged to the villages. Finally, the management of NMC deserves a good deal of the blame for the parastatal's financial difficulties. The inadequacy of NMC accounting practices is staggering. In the

absence of any kind of organized system of financial management, branches have developed their own system of identifying costs, monitoring stocks, and so on. This has rendered the task of comparing the efficiency of different branches virtually impossible. Indeed, until such time as accounting practices are in some way regularized, it is unimaginable that the financial performance of NMC will improve. Presently, no limiting constraints exist on expenditures by branch offices other than perceived need and availability of funds. Given the lack of accountability of branch managers to the main office, the top management has found itself unable to account for where and how NMC's funds are being spent.

The cumulative result of the above has been tremendous financial losses arising from the official marketing of food crops, as evidenced by NMC's Tsh 2 billion overdraft. This represents a tremendous drain on national resources, the macroeconomic consequences of which are dealt with in the preceding chapters.

3.1.1 The Legal Monopsony

It is illegal to sell more than very small amounts of grain to a buyer other than the NMC. It is also illegal to privately transport large quantities of grain. These are policy decisions, and ones with important implications for the Tanzanian grain market. In most parts of the country, for most parts of the year, the NMC price is lower than that offered on unofficial markets. Farmers who sell to the NMC are foregoing additional income; in this sense they are facing a tax. Legal enforcement of the government monopsony is more vigorous in some areas than others. It is more difficult and dangerous to sell on parallel markets in a surplus area like Urambo District of Tabora; for example, than it is in Mwanza. In many cases, communal production is sold

to the NMC to raise village revenues, while production from private plots in the same village is sold unofficially. This may have contributed to individuals allocating relatively less time to communal production and more time to their private plots. The policy and its enforcement have certainly increased the amount of maize NMC is able to purchase at official prices by effectively blocking farmers' access to higher price markets.

The policy of legal monopsony has also had an effect on unofficial markets. By making these transactions illegal it has raised the risk and the cost of providing marketing services. Buyers and sellers have to consider the fines and imprisonment they could face if caught by the authorities. Transportation in Tanzania is scarce, difficult, and expensive even when legal; to gain access to trucks, petrol, etc., on unofficial markets is both costly and time-consuming. These things force both farmers and middlemen to charge higher prices than they would if these markets were legal.

3.1.2 The Price-Setting Process

Given that the NMC is the official market for grain surpluses, the prices it offers to farmers are important in determining the quantity of its purchases. It should be emphasized, however, that these prices do not act in isolation; it is their interaction with parallel market prices and the factors which govern farmers' access to the two markets (i.e., enforcement of the legal monopsony and regulation of transport) which more fundamentally explain farmers' production and marketing decisions.

The technical analysis supporting all government-controlled agricultural pricing is conducted by the Marketing Development Bureau (MDB) of Kilimo (the Ministry of Agriculture). In general, MDB recommendations for food crop prices are based on import parity. This is reasonable, as over the past 15

years Tanzania has been a net importer of food in 2 out of every 3 years, and, more importantly, the average net annual imports (for maize) in deficit seasons have been 83,000 tons, while average net annual exports in surplus seasons have been 20,000 tons.⁶ To the extent that the official exchange rate understates the true value of foreign exchange to the Tanzania economy, this mechanism does not reflect the true value of food crop production to Tanzania.

MDB price recommendations are passed on to the Economic Committee of Cabinet which can (and often does) alter some of the proposals. These alterations often reflect political considerations such as long-term food security, foreign exchange generation, and rural income redistribution, and sometimes they have undesirable economic repercussions.

Two other aspects of the price-setting process are of interest here. First, there appears to be an unstated but nevertheless binding rule that official prices cannot be lowered.* This policy hampers MDB's ability to set prices which will encourage the production of different crops at economically optimal levels (based on supply/demand considerations).

Second, given the present system whereby producer prices for the coming season are announced in July, there is no way of revising prices during the growing season. In years of poor harvests, farmers consume a higher percentage of their total output. Smaller amounts of marketable sales drive up unofficial prices. Given a fixed level of production, the difference between the prices offered by NMC and offered on parallel markets widens, making unofficial sales relatively more attractive. Thus, in a poor season, NMC purchases capture a smaller portion of a smaller absolute amount of produce.

*The only exception to this was the lowering of the price of finger millet from Tsh 2.00 to 1.50 in 1980-81.

The aggregate effect of this is to lessen the amount of food available from NMC and increase the importance of parallel markets in meeting urban food requirements.

3.1.3 Official Purchases of Preferred Staples

Tanzanians, particularly in urban areas, have shown a long-term and increasing preference for maize, rice, and wheat relative to such traditional staple crops as sorghum, millets, grains, and cassava. Officially marketed surpluses of these crops are concentrated in a few surplus regions. Over the past decade, domestic production for the official market has been insufficient to meet demand, and substantial quantities of these products have been imported. Table 16 shows parastatal purchases of these crops, and imports (by year) for the past 6 years. Figure 3 shows the regional distribution of official marketings for the preferred staples.

Maize is the most important foodstuff in Tanzania. Maize demand has been growing throughout the country through population pressure and changing preferences, but official maize production has become increasingly concentrated in a few very productive regions. Table 17 gives the annual production of the five most important maize regions. Arusha, along with Kilimanjaro, has reduced official marketing in the past couple of years due to poor weather and increasing unofficial marketing. Dodoma and Iringa have remained important. Although parallel markets exist, strong political organization and transportation constraints have limited their viability for farmers. Rukwa and Ruvuma have shown strong increases and the potential for increasing production. The geographical isolation of these regions, and resulting high transport costs have raised questions about how efficient it is to continue encouraging surplus production there.

Table 16. NMC Purchases and Imports* of Preferred Staples 1975-76 - 1980-81
(Thousand Metric Tons)

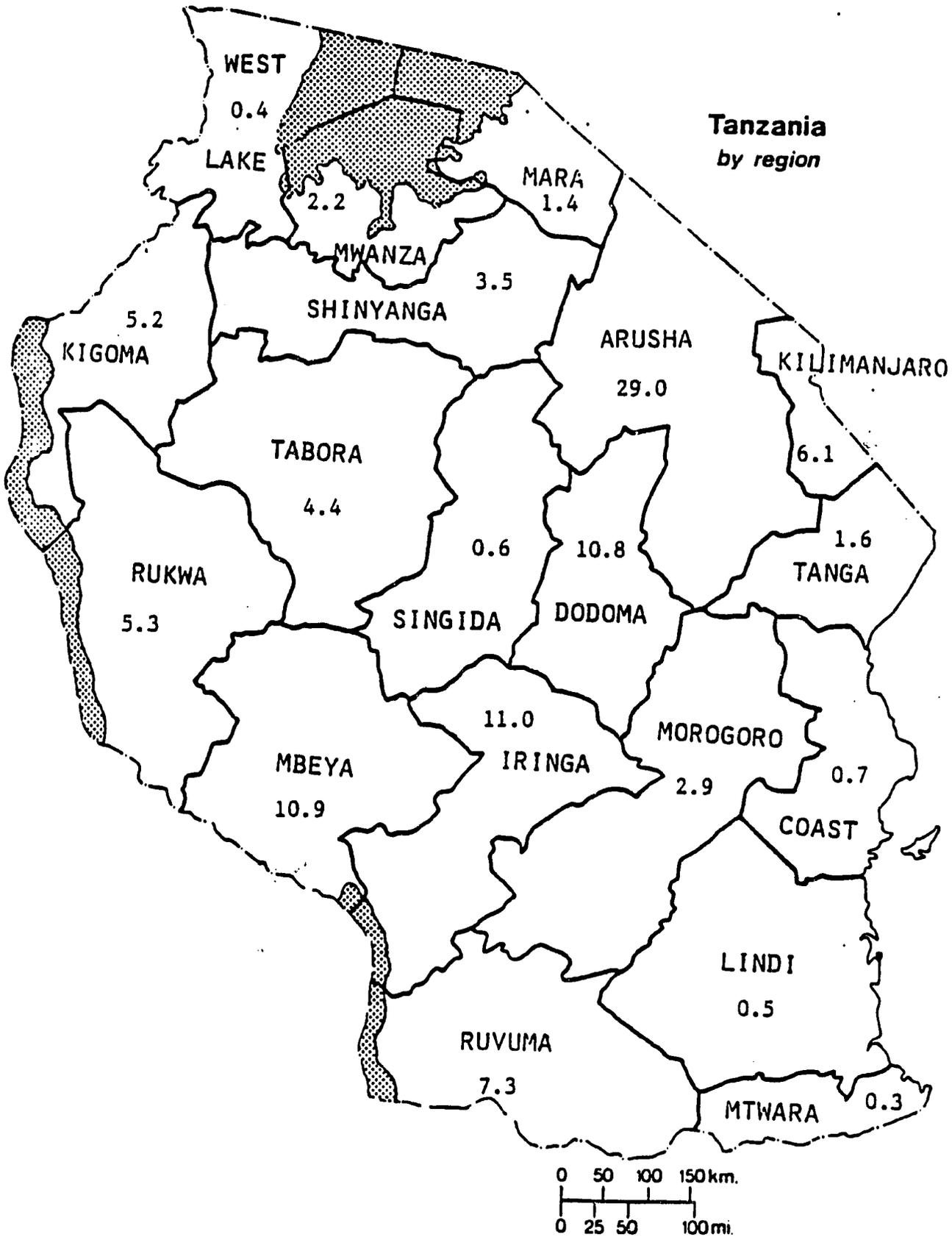
	Maize		Paddy**		Wheat		All Preferred	
	NMC Purchases	Imports (Exports)						
1975-76	91.0	97.2	18.0	20.7	25.0	60.2	134.0	178.1
1976-77	127.0	47.6	23.0	5.3	27.0	33.6	177.0	86.5
1977-78	212.7	35.2	54.7	52.9	35.0	45.1	302.4	133.2
1978-79	220.5	(50)	52.1	41.2	28.9	61.3	301.5	52.5
1979-80	160.4	28.7	46.4	42.8	26.6	32.5	233.4	104.0
1980-81	104.5	263.0	19.1	79.7	27.9	47.0	151.5	389.7
Six-year Total	916.1	421.7	213.3	242.6	170.4	279.7	1299.8	944.0

*Imports include both commercial and aid.

**NMC-purchased rice is converted to paddy at .65 kg rice = 1 kg paddy.

Source: FAO/KKIMO Early Warning/Crop Monitoring Project.

Figure 3.
**TANZANIA - Percentage of Officially Marketed Maize,
 Rice, and Wheat by Region**
 1977-78 - 1980-81



Source: Sigma One Corp. from MDB data.

Table 17. Percentage of Total Maize Purchases by Region

	1977/78	1978/79	1979/80	1980/81	1981/82 (est.)
Arusha	28	32	30	17	10
Dodoma	9	17	17	23	14
Rukwa	5	2	10	17	18
Iringa	10	12	17	21	22
Kuvuma	8	10	11	13	18
Five Regions	59	73	85	91	82

Source: FAO/Kilimo Early Warning and Crop Monitoring Project

Rice is more preferred and more expensive than maize in Tanzania's urban areas. It requires good rainfall (or irrigation) and soils which are capable of holding water. NMC buys both paddy (unmilled rice) and milled rice. Table 12 shows that NMC sales over the period have consisted of roughly equal parts domestic purchases and imports. Table 18 lists the five leading producing regions for official rice surpluses. Mbeya is far and away the dominant producer of rice; the majority of this production has come from a very successful National Agriculture and Food Corporation (NAFCO) farm located in the region.

Wheat is also much more expensive than maize and is popular primarily with urban residents. Arusha, Iringa, and Kilimanjaro produce virtually all marketed wheat in Tanzania. Arusha is the most important producer; the region has averaged 78 percent of national marketed production from 1974-75 to 1979-80. Most of this is grown on highly mechanized NAFCO farms. Iringa and Kilimanjaro have accounted for roughly equal shares of the remainder.

3.1.4 Official Purchases of Drought Staples

Much of Tanzania, particularly the drier central regions, is susceptible to drought. Throughout the 1970's and especially following the 1973-74 and 1974-75 growing seasons, government policies were designed to mitigate the potential effects of drought on national food security by promoting the cultivation of drought staples. These crops--cassava, sorghum, and millets--are traditional staples in many parts of the country.

Cassava has traditionally been an important element in the diets of people living in Mtwara, Lindi, Mwanza, and Tabora and is planted in most regions of the country. It gives good yields in poor soils with low rainfall, resists insects and birds, has minimal labor requirements, and can remain in

Table 18. Percentage of Total Paddy* Purchases by Region

	1977/78	1978/79	1979/80	1980/81	1981/82 (est.)
Mbeya	41	45	40	75	78
Shinyanga	10	19	25	9	8
Mwanza	3	10	13	2	6
Tabora	11	11	16	3	3
Morogoro	8	5	1	2	1
Five Regions	73	90	95	91	96

*NMC-purchased rice converted to paddy at .65 kg rice = 1 kg paddy.

Source: FAO/Kilimo Early Warning and Crop Monitoring Project.

the ground for up to two to three years as a famine reserve. NMC purchases fresh cassava, mills it, and sells it as a meal.

Three types of sorghum are grown in Tanzania. Mtama has been a traditional staple for inhabitants of Dodoma, Singida, Tabora, Shinyanga, parts of Arusha and, to a lesser degree Mtwara, Lindi, and Morogoro. The white variety is generally eaten, while the red variety is used mainly for brewing pombe (traditional beer). Both red and white mtama are highly susceptible to insects. Moreover, the harvesting, threshing, and milling of mtama is more labor intensive than other grains. Two improved types of dwarf sorghum have been distributed in recent years. Lulu, a white strain gives better yields than mtama but is equally susceptible to bird damage. Serena, a red strain, is an extremely hardy plant, but is universally disliked as a food source due to its bitter taste and indigestibility.

Finger millet (ulezi) has a longer storage life than any other grain grown in Tanzania. Its primary use is for brewing by the inhabitants of Kilimanjaro, Rukwa, and Mara. Bulrush millet, grown primarily in Dodoma, Mwanza, and Mara, has traditionally been of minor importance as a foodstuff in other regions. Today it is used commercially as animal feed and for brewing.

The cultivation of drought staples has been encouraged through guaranteed markets, increased producer prices, and public information campaigns carried out by political leaders and extension agents. In the period 1974-75 to 1977-78, real prices for cassava rose by 29 percent, for sorghum bulrush millet by 41 percent, and for finger millet by 182 percent (Table 19). Subsequent to these rapid price boosts, nominal producer prices for the drought staples were held constant in the 1978-79, 1979-80, 1980-81, and 1981-82 seasons (with the exception of a 5-cent-per-kilo increase for cassava in 1978-79 and a 50-cent-per-kilo decrease in the price of finger

Table 19. Real Producer Prices for Food Grains
(1980 = 100)

CROP	70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82
Maize	85	72	68	70	90	125/134	127	119	102	106	96	105
Paddy	189	155	145	121	117	167	159	168	144	159	167	175
Wheat	186	170	148	121	138	167	190	175	150	143	158	167
Wt. Avg. Pref. Shgs.	114	99	91	85	101	144	141	134	115	120	116	124
Sorghum	-	-	78	107	99	125	143	140	120	106	96	88
B-Millet	-	-	78	107	99	125	143	140	120	106	96	88
F-Millet	-	-	-	-	99	134/142	151	279	240	212	144	131
Cassava I	-	-	-	66	65	67	79	84	78	69	62	61
Cassava II	-	-	-	62	61	63	63	70	60	53	48	44
Wt. Avg. Dr. Staples	-	-	-	-	90	115	129	172	148	130	100	95

Source: MDB

millet in 1980-81). The real prices for all these crops have returned to the levels which existed at the time of the mid-decade drought years.

Official purchases of these crops have followed the trend of real prices (Table 20). It is of interest here to look at which regions were most responsive to the price changes, and, in particular, how well the policy of promoting drought staples worked in those areas which are most prone to drought. An examination of NMC's regional purchases for the period from 1975-76 to 1980-81 reveals the following:

1. In Mtwara, Lindi, Shinyanga, Singida, Tabora, Dodoma, Morogoro, and Arusha, sorghum production rose and fell according to movements in real prices. These are all regions in which sorghum has traditionally been grown and has formed a basic element of people's diets. Interestingly, in Mbeya and Iringa, sorghum sales to NMC also followed the price trend. In all other regions, official purchases either did not respond to the price changes or production increases were minor.
2. In Lindi, Mtwara, Singida, Tabora, Dodoma, and Arusha, official purchases of bulrush millet followed the price trend. For finger millet, this was true of Mara, Dodoma, Singida, Rukwa, Mbeya, Arusha, and Mara.
3. In Ruvuma, Kagera, Mwanza, Mtwara, Shinyanga, Tabora, Rukwa, and Lindi, official purchases of cassava were significantly affected by the price trend.

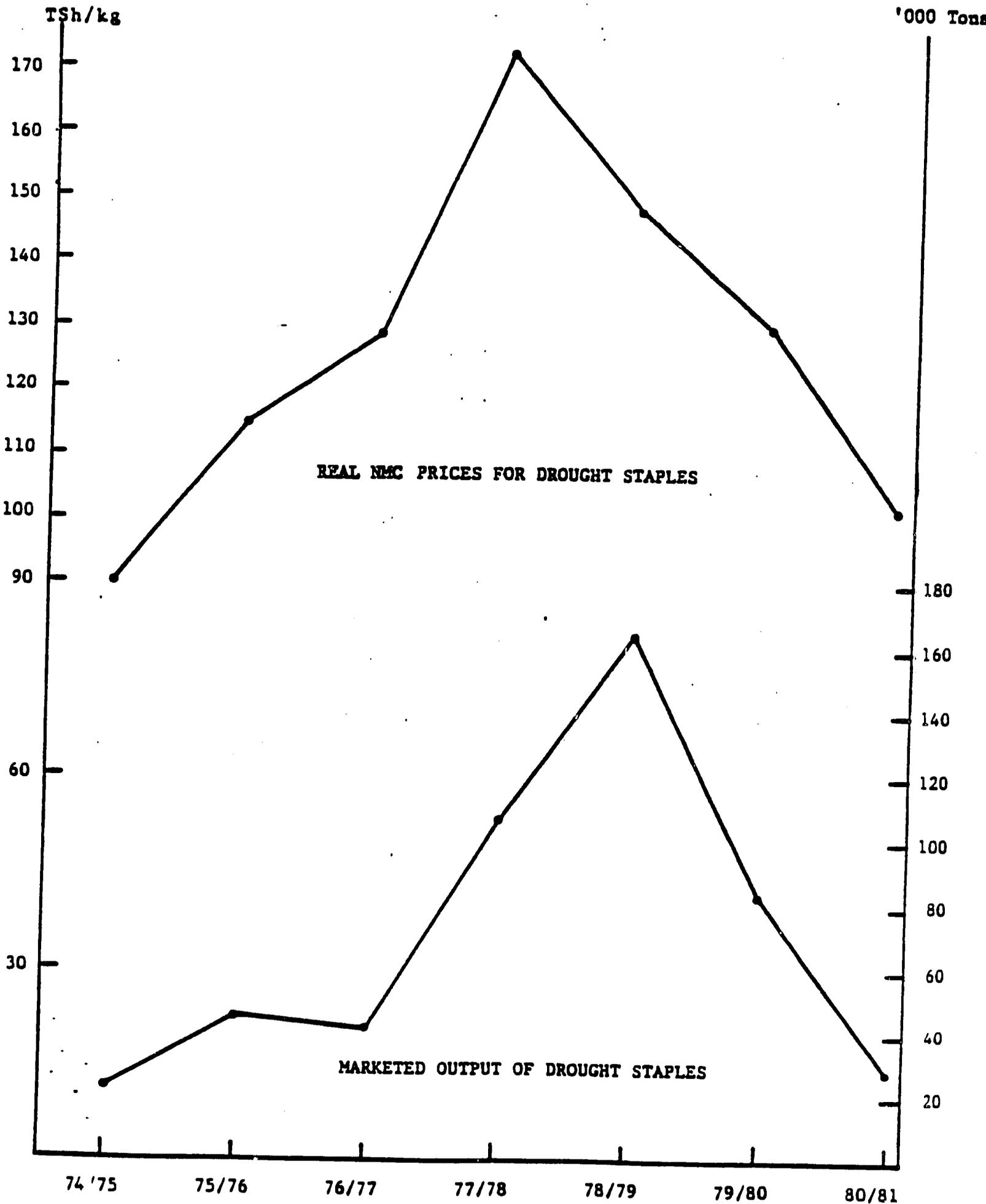
These findings clearly indicate that Tanzanian farmers responded quickly and predictably to price changes for drought staples (see Figure 4). Two results are especially important. First, in the particularly drought-prone central regions (Shinyanga, Mwanza, Mara, Singida, Dodoma, and Tabora), the production of surpluses for the official market for at least one of the drought staples was significantly increased when official prices were boosted. As such, the policy of promoting drought staples succeeded in getting farmers to plant more of them. However, it cannot be assumed that consumption of drought staples was increased, since the seasons in which production increased

Table 20. Official Purchases of Drought Staples, 1972-73 - 80/81
(thousand tons)

CROP	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81
Sorghum	0.6	1.7	1.9	2.9	10.1	33.6	58.6	20.7	18.9
B. Millet	0.3	2.4	2.5	2.2	6.4	14.4	16.5	1.3	0.3
F. Millet					4.5	22.3	23.4	15.5	1.2
Cassava	14.3	18.9	17.8	17.4	20.2	36.9	63.8	44.2	7.5
Total	15.2	23.0	22.2	44.7	41.2	107.7	162.3	81.7	27.9

Source: NMC.

Real Producer Prices and NMC Purchases of Drought Staples, 1974/75-1980/81



Source: Sigma One Corp.

most dramatically (1976-77 and 1977-78) were extremely good growing seasons for the more preferred staples (maize and rice). Second, in some regions with more reliable rainfall such as Mbeya, Iringa, Ruvuma, Arusha, Kagera, and Rukwa--NMC drought staple purchases increased markedly as well. In these regions and also, to a lesser degree, in drought-prone regions, it appears that drought-staples were largely cultivated as cash crops, and thus the promotion policy placed them in direct competition with traditional export crops (coffee, tea, and tobacco) and preferred food crops (maize and rice). The NMC was forced to export the resulting surpluses at a loss in the 1978-79 marketing year.

3.1.5 Pan - Territorial Pricing

Prior to 1974, into-store prices at regional go downs were the same for all officially marketed crops, but producer prices within each region varied, the difference depending mainly on local transport costs. Pan territorial pricing was introduced in order to minimize the differences in returns to farmers having different locational advantages with respect to final markets and export points. As Ndulu argues, this amounts to a transport subsidy to farmers in remote areas poorly serviced by roads or railways, and an indirect tax on those farmers who have better access to markets (either by proximity to those markets or to roads/railways).⁷

The introduction of pan-territorial pricing had two explicit purposes: to equalize income differentials between farmers living in different regions and to increase national agricultural output by stimulating production in remote areas through price incentives. It appears, however, that pan-territorial pricing has not accomplished the first of these objectives.. If productivity is uniform across regions, then paying uniform prices to growers

would equalize incomes. But this is not the case in Tanzania, where differences in resource endowments (i.e., soil fertility, land availability, and weather) cause substantial differences in productivity, even where cultivation techniques are similar.

To illustrate this, consider the possible income redistribution effects of uniform pricing on two regions, Morogoro and Ruvuma. Morogoro is dry with generally poor soil. Ruvuma has fairly abundant rainfall and rich soils. Morogoro is much closer to the major food consuming centers (Dar, Tanga, Mwanza, Arusha) than Ruvuma. Furthermore, Morogoro is serviced by the central rail line, facilitating transport of marketed produce. Given pan-territorial pricing, and assuming that similar crops are grown, farmers in Morogoro--despite poorer yields and generally lower incomes--effectively subsidize the transport costs of their counterparts in Ruvuma, because of their geographical and logistical advantage. This runs counter to the government's original intentions.

With respect to the objective of increasing officially marketed output, the transport subsidy has undeniably led to an enormous expansion of production for official markets in remote areas, particularly Rukwa and Ruvuma. Prior to the introduction of pan-territorial pricing, these two regions were supplying negligible amounts of maize to the NMC; in the past several years they have become two of the major maize-surplus regions in Tanzania. MDB, in a 1980 analysis of regional pricing options for maize, estimated that the transport costs entailed in procuring this maize for sale in urban demand centers are Tsh 1.32 per kilo for Rukwa and Tsh 1.12 for Ruvuma.⁸ The magnitude of these costs has caused enormous losses for the NMC. For the 1980-81 buying year, the transport costs alone for maize procured in the two regions

totalled nearly Tsh 40 million. This is fairly dramatic when one considers that NMC sales of this maize generated less than Tsh 36 million in revenues.

MDB and Ndulu make strong arguments, on both practical and theoretical grounds, that differences in transport costs should be reflected in the prices paid in different regions. The analyses in both papers conclude that very low prices should be paid to farmers in the remote and productive regions of Rukwa and Ruvuma. The fundamental question here is whether the foreign exchange-intensive transport costs are worth the domestic and foreign exchange costs which would be spent in procuring maize elsewhere. The official market for maize seems to have the primary function of providing urban supplies to Dar es Salaam and the northeastern regions. This being the case, the criteria for setting prices in remote regions should be based on the alternative cost of providing a marginal unit of maize to these urban consumers.

Alternative sources fall into two categories: production from regions nearer to the final markets and imports. With regard to the former, Ndulu argues that the higher producer prices which would accompany the removal of the transport tax in regions like Morogoro would increase maize supplies by more than the decrease in supplies caused by the very low prices in regions previously enjoying the subsidy. This is based on his findings that farmers in "close-in" regions are at least as responsive to changes in official prices as farmers in the remote southwest.

Several factors indicate that this is not the case. Clearly, farmers in Rukwa and Ruvuma are highly responsive to official prices. This is borne out by the large increases in the amounts of maize they supplied to the NMC after its institution as a guaranteed market. Alternative marketing options for those farmers are extremely limited by their geographical remoteness. On the other hand, in places like Morogoro and Coast regions, most surpluses go to

parallel markets at prices much higher than the NMC's. As such, the prices on which farmers in these regions base their planting decisions are likely to be much further from NMC's prices than those of farmers in Rukwa and Ruvuma. The weak response of producers in close-in regions to the 20 percent increase in official producer prices in the current year lends support to this argument.

Given the above considerations, it is doubtful whether increases in official prices would produce the large overall increases in officially marketed maize predicted by Ndulu. The real implication of reinstating regional price differentiation based on transport costs will more likely be an increased reliance on imports, particularly if the country continues to experience poor harvests.

The MDB argument in favor of paying low prices to farmers in Rukwa and Ruvuma is based on estimates of the transport costs for maize procured in those areas and the foreign exchange component of those costs (estimated to be 80 percent). We have no reason to dispute the accuracy of these estimates. Given that transport costs are so critical to this decision, however, it should be pointed out that these costs are inflated by NMC's disorganization and inefficiency. If large savings can be made by greater use of railroads, higher capacity utilization and backhauling by lorries, then maize production in these regions would become more viable.

Clearly, pan-territorial pricing imposes a real distortion in the Tanzanian agricultural economy. However, it is only one of several inter-related distortions which are currently causing a misallocation of resources. It is in no way certain that by simply removing these particular sources of allocative inefficiency the entire system will operate more efficiently in any overall sense.

The 1982-83 producer prices announced in July 1981 will re-introduce a form of regional price differentiation. The new system will pay bonuses to growers of maize, paddy, millets, sorghum, and cassava in those areas which are agronomically better suited for the production of those crops. The emphasis of the new mechanism appears to be on food security issues (i.e., drought staple production in dry regions, maize and paddy production in regions with more favorable weather) rather than on relieving NMC of the financial burdens of sub-optimal spatial distribution of production. Under the new system, both Rukwa and Ruvuma will receive the "bonus price" for maize. This runs exactly contrary to the conclusions in the MDB and ERB analyses cited in this section.

Moreover, the new system will more than likely lead to further accumulation of unwanted drought staples in places like Tabora, Shinyanga, Mara, and Singida for the same reasons they built up in 1977 and 1978.

Finally, any new pricing scheme which attempts to rationalize the spatial distribution of Tanzanian agricultural production must include regional price differentials for export crops. It is reasonable to assume that if producer prices truly reflected actual marketing costs, then individual farmers in remote areas would be likely to allocate more of their resources to the production of high value-density crops such as tobacco. In an economy like Tanzania's in which producer prices are set by the government, the announced prices must transmit the appropriate price signals by setting a high per unit price for such crops.

3.1.6 Official Interregional Transfers of Grain

It is much easier to quantify the inter-regional transfers of grain on official markets than the flows on parallel markets. The measure used here

simply consists of the difference between the surplus (outflow) or deficient (inflow) of preferred staples bought and sold by the National Milling Corporation for each marketing year.*

On an aggregate national level the NMC bought more grain than it sold in 1977-78 and 1978-79; in the other 4 years of the period covered in Table 21, more was sold than purchased domestically. The surplus (deficit) is assumed here to have two components: the import/export balance and the NMC's change in stocks. It is clear from an examination of the yearly flow of imports and exports of preferred cereals that Tanzania has been making up the difference between official sales and purchases during this period with imports.

The major recipient of inflows of grain has been Dar es Salaam. In Table 22, the addition or subtraction from marketings caused by imports, exports, and changes in stocks is given in the second column. Assuming that these "external" adjustments go first to satisfy Dar es Salaam's requirements, the balance of Dar es Salaam's consumption can be thought of as a transfer from other regions. This figure is given under the heading "Domestic Transfer." In 1974-75, the only year that the national deficit was greater than Dar es Salaam consumption, there was effectively no domestic surplus to transfer. In all other years NMC purchases were greater than sales if the capital is excluded from the computation.

Other regions have consistently been recipients of inflows of officially marketed grain. Tanga has received more grain than it supplied in five years out of six; its average annual deficit was 10,407 tons. Kagera was a deficit region every year, averaging a net import of 4,336 tons of preferred staples. Mtwara and Lindi have also shown a deficit each year.

*Milled grains sold by the NMC are converted to grain equivalents for this analysis using the following factors: 0.9 kg sembe = 1 kg maize; 0.65 kg rice = 1 kg paddy; 0.75 kg wheat flour = 1 kg wheat.

Table 21

Regional Surpluses and Deficits (-) of Preferred Grains

(tons of Grain Equivalents)

1974/75 - 1979/80

REGIONS	1974_75	1975_76	1976_77	1977_78	1978_79	1979_80	Average 1974_75 1976_77	Average 1977_78 1979_80	Average 1974-1980
ARUSHA	-25193.8	12265.6	19365.9	73969.8	80041.3	51214.7	2145.9	68408.6	35277.2
IRINGA	263.9	10437.9	13006.9	20430.2	24931.8	20821.1	7902.9	21761.0	14832.0
ZIGOMA	-402.1	-4482.2	446.2	374.8	696.0	260.2	-1479.4	443.7	-517.8
KILIMANJARO	10876.5	2687.0	5153.8	25983.0	13958.0	1366.2	6239.1	13769.1	10004.1
KAPA	-8279.5	-2900.2	1988.9	2094.6	1206.6	180.7	-3063.6	1160.7	-951.5
MDEYA	11144.7	11957.3	8806.6	36415.3	27552.8	22572.0	10636.2	28846.9	19711.5
KOFOSOPO	-20506.7	7587.3	292.9	15825.8	6764.6	-6729.5	-4208.8	5287.0	529.1
KWANZA	-12440.6	-8941.6	-11866.8	-845.0	784.5	2729.3	-11083.0	889.6	-5096.7
MTWARA	-21594.7	-2742.6	-1977.6	-3841.8	-3939.5	-2365.1	-8771.7	-3382.1	-6076.9
RUVUMA	2802.2	11460.6	10466.6	15553.3	21773.9	16868.6	8243.1	18065.5	13154.3
SHINYANGA	269.1	-6089.5	-4236.6	5755.3	10032.6	10943.2	-3352.3	8910.4	2779.0
SINDIGA	-11069.4	-1716.0	-5658.8	-1290.4	1216.9	-2479.4	-6148.1	-851.0	-3499.5
TADORA	-4978.0	-9741.6	-519.3	11952.5	9126.6	10276.5	-5079.8	10451.9	2636.0
TANGA	-19350.0	-48.0	2085.8	-11947.0	-10333.7	-22851.4	-5770.7	-15044.0	-10407.4
KAGERA	-1917.3	-3381.0	-3041.1	-3205.0	-12742.8	-1726.0	-2779.8	-5891.6	-4335.7
DODOMA	-16236.2	-10170.3	-2267.7	9770.5	23940.6	12143.3	-9574.7	17284.9	3055.0
FUKYA	.	.	.	9809.4	4972.3	15525.0	.	10102.2	10102.2
LINDI	.	.	.	-1991.6	-1563.7	-1230.9	.	-1595.4	-1595.4
COAST/DAR ES SAL	-94443.9	-85667.8	-97246.6	-115673.6	-152459.7	-143447.3	-32452.8	-137193.5	-114823.2
TANZAN MAINLAND	-208605.8	-73485.2	-45214.3	92690.7	54130.8	-15458.5	-109101.8	43747.7	-32657.0

Source: Sigma One Corp.

Table 22. Dar es Salaam Consumption of Preferred Grains

Year	DSM consumption	National deficit	Domestic transfer to DSM
1974/75	94	-209	-
1975/76	86	- 73	13
1976/77	97	- 45	42
1977/78	115	+ 92	115
1978/79	152	+ 54	152
1979/80	143	- 15	128

Source: Sigma One Corp. from MDB data.

At the other extreme are the regions which have consistently supplied the parastatal with surpluses. In order of average volumes, these regions are: Arusha, Mbeya, Iringa, Ruvuma, Rukwa, and Kilimanjaro. These six regions had a net outflow of 588,000 tons, or 98,000 tons per year from 1974-75 through 1979-80. The average national deficit during this period was 33,000 tons per year.

All other regions showed both surpluses and deficits for the years in question; as a general rule there were surpluses in the good harvest years of 1977-78 and 1978-79. Inter-regional flows through official channels were particularly large in 1974/75 as imports were distributed in the national effort to alleviate the effect of serious food shortages.

3.2 Parallel Markets for Grain

Parallel markets exist because official markets for grain in Tanzania are unable to equilibrate the supply and demand for grain for large segments of the population. Many farmers are unwilling to produce grain for the official price; others cannot easily sell on official markets because of poor access to NMC buying due to the parastatal's logistical constraints. Because NMC's sales are limited by low levels of purchases, and because NMC grain is sold disproportionately in a few urban areas, many consumers are unable to meet food requirements through the parastatal. The unofficial agricultural markets which communicate demand to farmers and supply consumers with essential food commodities are a large and essential part of the food system in Tanzania. This section will first present evidence to show why parallel markets are necessary. Then these markets will be described in terms of the farmers, marketers, and consumers involved. We will then examine the evidence which exists about price levels on parallel markets and their implications for access to food by different segments of the population.

3.2.1 Urban Food Needs and the Necessity of Parallel Markets

The preferred grains which NMC sells are cheaper than those sold on parallel markets. In the case of maize there is a direct subsidy; from January 1980 until July 1981 sembe sold for Tsh 1.25 per kilo while costing NMC 3.80; the consumer price is now Tsh 2.50 with rice and wheat flour selling for Tsh 5.35 and 5.65, respectively. All these prices are well below parallel market prices, and all are subsidized by the country at large through financing of NMC's operating deficit. Table 23 gives the NMC's price of preferred staples from 1973 to the present.

Table 23. Official Retail Prices for Sembe, Rice and Wheat Flour 1973 to 1981 (Sh/kg loose)

Product	Jul 73 to Mar 74	Apr 74 to Oct 74	Nov 74 to May 75	May 75 to Aug 75	Aug 75 to Jan 80	Jan 80 to Jun 81	June 81 onward
Sembe	0.80	1.25	1.75	1.75	1.75	1.25	2.50
Rice	1.65	2.00	5.00	4.00	3.50	5.35	5.35
Wheat	1.65	2.40	4.55	3.75	3.75	5.75	5.65

Source: MDB

Residents of different regions who are dependent on market purchases for their basic food supply have differential levels of access to NMC/RTC sales. The NMC allocates grain to the regions. However, once that central allocation decision has been made, individual Regional Trading Corporations (RTC's) decide where and when to sell. The RTC's receive little or no extra remuneration for transporting grains for sale to rural areas, and the residents of district and regional centers are more able to make the RTC's aware of their food demands. For these reasons the great majority of sales are in urban areas.⁹

The less the parastatal supplies, the greater the need for consumers to purchase food on parallel markets. Although many rural consumers are dependent on other people's production, and some town residents provide part of their own food supply, the projected food needs of towns provide an indication of the minimum market demand for food. By comparing these food needs to the number of NMC/RTC sales in each region we can demonstrate two important facts. The first is that some regions receive much greater portions of NMC grains than others; the second is that urban consumers in many regions have no choice but to depend on unofficial sales.

Table 24 presents the percentage of urban food needs met by parastatal sales over the past 6 years. The calculation depends on three assumptions:

1. The per capita consumption of grains in urban areas is 180 kg per person per year. This is the FAO standard for a cereal-based diet.¹⁰ MBD has used 219 kg. in past analyses; if this standard were used here, the NMC would seem even less important in meeting urban food needs.
2. The RTC's sell 80 percent of their grain in district and regional centers. In some years the NMC will sell more grain in rural areas due to acute food shortages. This is the explanation for statistics of over 100 percent. (For example, 244 percent in Arusha in 1974-75 reflects the fact that more than 20 percent of RTC sales were in rural areas, due to the severe grain shortage caused by extreme drought.) This serves to overestimate the parastatal supply of relatively inexpensive grain to urban areas, which does not change the basic point of the analysis.
3. In Dar es Salaam/Coast regions, 100 percent of NMC sales were in urban areas.

The table shows that Dar es Salaam has met a very high percentage of its grain needs through official NMC sales. From 1974-75 through 1976-77, an average of 70.7 percent of the capital's projected demand was met through NMC sales. From 1977-78 through 1979-80 this figure rose to 90.1 percent. Dar es Salaam produced no maize for sale to the NMC during this period, yet received between

Table 24. Percentage of Urban Food Needs Met by M/C Sales

REGION	1974/75 - 1979/80								
	_1974_75	_1975_76	_1975_77	_1977_78	_1978_79	_1979_80	_1974_77	_1977_80	_1974_80
ARUSHA	243.9	118.9	100.0	93.9	102.7	110.0	154.3	102.2	128.2
IRINGA	59.9	31.5	23.4	35.5	33.3	37.9	38.3	35.6	36.9
KIGUMA	11.3	52.8	15.5	15.9	9.8	40.7	26.3	22.1	24.3
KILI MANJARU	20.3	48.6	80.9	60.1	92.4	124.0	49.9	98.8	74.4
MARA	110.9	43.6	38.3	34.9	30.3	27.2	64.3	30.8	47.5
MBEYA	1.0	12.2	6.0	18.9	27.0	16.5	6.4	20.8	13.6
MOROGORU	114.6	22.8	48.7	24.8	27.9	29.1	62.0	27.2	44.6
MWANZA	62.5	50.5	54.4	24.6	37.4	16.0	55.8	26.0	40.9
MTWARA	108.8	42.0	33.4	39.7	26.0	12.5	61.4	26.0	43.7
RUVUMA	25.3	27.2	17.7	17.8	16.6	15.4	23.4	16.6	20.0
SHINYANGA	41.4	84.6	42.7	26.0	25.9	51.7	56.2	34.5	45.4
SINGIDA	147.1	31.1	63.3	20.5	20.3	20.1	80.5	20.3	50.4
TADORA	50.9	60.6	30.6	11.2	18.1	11.7	49.4	13.7	31.5
TANGA	91.1	75.9	7.6	74.8	58.8	66.7	78.5	66.8	72.6
KAGERA	104.6	125.7	123.6	114.9	345.3	53.5	119.6	171.2	145.4
DUDUMA	123.7	120.7	103.2	71.0	50.8	91.9	115.9	71.2	93.6
RUHA	.	.	.	21.2	18.4	18.3	.	19.3	19.3
LINDI	.	.	.	68.4	38.2	19.2	.	41.9	41.9
CJAST/DAR ES SAL	73.7	63.8	74.7	87.9	93.9	88.6	70.7	90.1	80.4
TANZAN MAINLAND	87.7	66.7	68.5	70.6	74.1	69.1	74.3	71.3	72.8

Source: Sigma One Corp.

31.1 percent and 56.3 percent of total national sales (average 46.4 percent). Dar es Salaam also received an average of 48 percent of rice sales and 53 percent of wheat sales during this period.

Other regions where NMC has consistently been an important supplier over the six marketing years include Tanga (which contains Tanzania's third-largest urban area), Kilimanjaro, Arusha, Kagera, and Dodoma. Sales relative to urban population have increased noticeably in the past three years in Kilimanjaro and Kagera, and have declined slightly in Arusha and Tanga. In Dodoma the 1977-78 and 1979-80 percentages were only 63 percent of those in the previous 3-year period. It should be noted that about 30 percent of the grain NMC sold in Kilimanjaro region was finger millet--most of which was probably used for brewing. Table 25 shows how high a share of total NMC sales of preferred grains were supplied to these six regions.

Table 25. NMC Preferred Grain Sales in Dar es Salaam, Tanga, Kagera, Arusha, Kilimanjaro, and Dodoma

Year	Percent of National Sales
1974/75	63
1975/76	66
1976/77	73
1977/78	78
1978/79	79
1979/80	82

Source: NMC

The decline in Dodoma sales is consistent with NMC's decreased supplies to the dry, drought-prone regions in central and northwest Tanzania. Morogoro sales declined from 62 percent to 27 percent of projected needs between 1974-75 - 1976-77 and 1977-78 - 1979-80, Singida from 81 percent to 20

percent, Tabora from 49 percent to 14 percent, Mara from 64 percent to 21 percent, Morogoro from 56 percent to 35 percent, and Mwanza from 61 percent to 26 percent. This has led to an increased demand for parallel market grain in towns and cities, and thus made parallel market sales in these regions more attractive to farmers relative to sales to NMC. These regions also produce 88 percent of Tanzania's cotton (1978-79), and the increases in parallel market demand engendered by NMC's reduced sales have probably been an additional factor in the decline of cotton production (see Section 2.1.5.3).

Mwanza is Tanzania's second-largest urban area, and its rapid growth and increased grain needs have caused a major flow of parallel market grains from all surrounding regions. In the western and southwestern regions--Rukwa, Ruvuma, Mbeya, and Kigoma--the NMC has been of little import in meeting grain needs. The parastatal has reduced its sales to Mtwara and Lindi steadily over the past 6 years. Sales bottomed out at 12 percent of urban demand in Mtwara and 18 percent in Lindi in 1979-80. In Iringa, a major surplus area, NMC sales have held constant at around one-third of projected needs.

The major point of the above analysis is that in many urban areas of Tanzania many consumers are forced to depend on parallel markets for grain supplies. If these markets stopped functioning, the NMC would have to drastically expand its sales in most areas of the country just to meet food demands by Tanzania's urban minority.

3.2.2 Functioning of Parallel Markets

When residents of rural areas buy grain, they ordinarily do so directly from local farmers. The most important determinant of availability and price is the level of production (and therefore available surplus) in the area.

These rural consumers may plan on exchanging cash or goods produced from other economic activities for their food, or they may be forced onto the market because of their own poor harvests. Prices in those markets have been rising due to inflation and the deteriorating terms of trade in the agricultural sector. Although demand from larger population centers may result in a net outflow of grain from these rural areas, it is less likely that in years of poor harvest there will be inflows of grain to local markets from other areas.

The analysis in the preceding section indicates that residents of many urban areas depend on parallel markets for their food needs. Rice is an important crop in urban markets; urban residents with higher incomes and strong preferences for rice as a staple pay high prices. Maize is still the staple food of most urban dwellers, and cassava is also commonly brought to the larger towns. Much of the flow of grains into district, and even regional centers, is done in a small-scale, informal way. The expense of transportation, however, forces this trade to use vehicles and fuels efficiently. Many cars and trucks on other business carry a sack or two of grain as well. There are enough farmers with reason to go to town and enough town residents with friends or relatives in peripheral areas to account for a large part of this trade. Middlemen and their access to transportation become important in two kinds of grain markets: those that involve major one-way flows from one region to another, and those that involve illegal exports.

Mwanza is a city with a fast-growing population dependent on sources other than the NMC for the majority of its food supply. In the months preceding the 1980-81 harvest a considerable portion of Mwanza's demand has been met by illegally transported and sold maize from Mbulu and Hanang Districts in Arusha.¹¹ It appears that in these two highly productive areas,

enterprising individuals established parallel marketing networks in an attempt to realize the best possible returns from available surpluses. Trucks and petrol have had to be acquired for this purpose. Even at the high parallel market cost of transport, it pays individual traders to make the trip west to Mwanza and other areas. The fact that NMC purchases in Arusha have declined drastically in the past 2 years while harvests have not suffered nearly as badly attests to this (Table 26).

Table 26. NMC Purchases of Maize from Arusha, 1977/78 - 1981/82

Year	Volume (1000 Tons)
1977/78	60.3
1978/79	69.5
1979/80	47.4
1980/81	17.4
1981/82*	11.8*

*Estimated

Source: NMC

Grains are exported illegally from border areas in Mbeya, Rukwa, Kigoma, Mara, Arusha, and Kilimanjaro. These flows go primarily to Zambia, Kenya, Rwanda, and Burundi. High parallel market exchange rates and shortages of consumer and capital goods are a major impetus to this trade. A trader who sells maize over the border can get Tsh 2.5 to Tsh 3.5 for each Kenyan shilling he brings back into the country; the two currencies are officially almost on par with each other, with the Kenyan shilling worth slightly less than the Tanzanian shilling. The trader can also purchase cloth, batteries, or a number of other items which are very scarce in Tanzania. These items may be used by the marketers or resold on the parallel market in Tanzania. The returns to smuggling are large, allowing those involved to offer high prices

or goods to farmers in return for their maize or rice. This offers a real incentive for increased production to producers in border areas. It also raises the prices to local consumers and makes NMC procurement even more difficult.

3.2.3 Prices on Parallel Markets

The best available evidence on parallel market prices comes from David Pudsey's survey of farm management and farm household decision-making. Price data from informal village markets in 13 villages in Mwanza, Mara, and Shinyanga were gathered twice a month over a 2-year period. The crops included are maize, rice and paddy, sorghum, millet, cassava, and beans. The majority of sales in these markets were thought to be for local consumption, although products were also transported to town markets and urban centers. Other evidence comes from Loft and Oldevelt's study of agricultural decision making in Kigoma and from reports submitted as part of the National Food Situation Survey.

These reports give clear evidence that prices on parallel markets are ordinarily higher than those offered to farmers by the NMC. This is illustrated quite clearly by the prices offered on parallel markets in the sample from the Lake Region. Table 27 shows the average prices received during the 1979-80 and 1980-81 marketing years (August 1 to August 1) on the parallel and the official markets and the relative price.

The parallel market prices are higher than the NMC price for every crop during both years. The difference in absolute terms ranges from Tsh .81 per kilo for paddy in 1979-80 to Tsh 5.45 per kilo for finger millet in 1980-81. The relative price ratio between unofficial and official prices is a minimum of 1.54 and a maximum of 4.68. Over the 2-year period in question, farmers

Table 27. Parallel Market Prices for 13 Lake Region Villages Relative to NMC Prices

1979-80	Parallel market price	NMC price	Relative Price: parallel to NMC	Absolute Difference: Parallel and NMC prices
Maize	3.08	1.00	3.08	2.08
Rice	6.96			
Paddy	2.31	1.50	1.54	.81
Cassava*	1.99	.65	3.06	1.34
Sorghum	2.96	1.00	2.96	1.96
Millet	4.73	2.00	2.37	2.73

1980-81	Parallel market price	NMC price	Relative Price: parallel to NMC	Absolute Difference: Parallel and NMC prices
Maize	4.98	1.00	4.98	3.98
Rice	10.94			
Paddy	4.23	1.75	2.41	2.48
Cassava*	2.98	.65	4.45	2.24
Sorghum	4.68	1.00	4.68	3.68
Millet	6.95	1.50	4.63	5.45

I - *Assumed to be Grade I Cassava

Source: Sigma One Corp.

who sold to the NMC would have had drastically lower incomes than farmers selling on the parallel market. As an example, consider a farmer whose annual marketed surplus consists of 500 kg of maize, 250 kg of Cassava, and 250 kg of finger millet. In 1979-80 his income would have been 220 percent higher selling parallel on the market rather than to the NMC. In 1980-81 the parallel markets offered returns 377 percent higher than the official market. Both of these cases are shown in Table 28.

The wide differential between parallel and official price is corroborated by MDB and NMC personnel from Kilimo Food Situation Survey reports from 1980/81. W. Ngirwa, M.A. Sackett¹² and J. Jansonius¹³ report prices for maize sold in town and city markets in Table 29. These prices are for markets of higher volume than in the Pudsey sample. The Kigoma, Tabora, and Mwanza prices indicate that the high prices pertain in major urban markets as well as village markets with very few buyers and sellers.

Loft and Oldevelt present evidence that price is an important factor in farmers' decisions on whether to sell to the NMC or on parallel markets.¹⁴ They present data for six villages whose primary economic activity is growing maize and beans. In the case of beans the NMC purchase price of 3.50 is equal to or above recorded farmgate prices for each month from May 1977 to August 1978 except for the period from September 1977 to March 1978. During this period, 88 percent of total bean sales were to NMC, although sales to the parastatal dropped substantially in months when the official price was well below the open-market price. The mean price for maize, however, was 46 percent higher than the NMC procurement price during this period. Only 20 percent of maize sales from the same villages went through the NMC; the remainder were sold at the higher prices.

Table 28. Income of Hypothetical Smallholder: Parallel Markets versus NMC

Year	Crop	Quantity (kg)	Income (Tsh)		% Difference in income
			@ NMC	@ parallel	
1979/80	Maize	500	500	1540	
	Millet	250	500	1183	
	Cassava	250	163	995	
Total			1163	3718	220
1980/81	Maize	500	500	2490	
	Millet	250	375	1738	
	Cassava	250	163	723	
Total			1038	4975	377

Source: Sigma One Corp.

Table 29. Parallel Market Prices for Unground Maize

Region	District	Price	Date
Singida	Mangoni	n/a	10/80
Singida	Singida	2.33	10/80
Tabora	Tabora	2.67	10/80
Tabora	Urambo	2.33	10/80
Tabora	Ulyankulu refugee settlement	1.20	10/80
Tabora	Nzega	2.67	10/80
Mwanza	Mwanza	4.00	10/80
Mwanza	Mwanza	5.67	1-3/81
Mwanza	Geita	6.00	1-2/81
Mwanza	Geita	4.00	5/81
Mwanza	Magu	5.33	5/81
Kagera	Ngara	4.67	10/80
Kigoma	Kibondo	4.00	10/80
Kigoma	Kasula	2.33	10/80
Kigoma	Kigoma	3.33	10/80
Rukwa	Mpanda	2.67	10/80
Rukwa	Sumbawanga	1.67	10/80

Source: NMC, MDB

3.2.4 Inter-Year Variation in Prices

In years of poor harvests, marketed surpluses fall and demand for marketed grains stays constant or rises as farmers unable to provide for their own subsistence needs become buyers. This causes grain prices on parallel markets to rise; NMC prices are announced before the growing season and so are unable to adjust. This is demonstrated by the difference in price levels in the Lake Region sample for the eight towns with price data in consecutive years.

The 1979-80 marketing year was a good one, due to good harvests in 1978-79. The harvest following the 1979-1980 growing season was lower, causing reduced volumes of marketable surplus in the 1980-81 marketing year. This is reflected in the official production estimates for those years and verified by interviews with Mwanza residents. Table 30 shows the minimum, maximum, and mean prices of towns in the sample for both years. Prices for all crops are substantially higher in the poorer marketing year, even deflating the 1980-81 prices by the CPI for Tanzania. Even cassava, which theoretically can be harvested during poor years after being grown in good ones, shows an increase of 38 percent, indicating that producers and consumers react to changing overall supply situations even with a crop whose output levels were relatively less affected by weather conditions.

Local purchases and unofficial sales to urban centers and other areas are likely to represent an even greater share of marketed food crops in poor years than in good ones. This exacerbates the year-to-year fluctuation in domestically-produced grain available to feed the urban population dependent on the NMC, increasing the need for food imports. It can be seen from Table 31 that NMC purchases of maize fluctuated wildly between 1973-74 and 1980-81, with a low of 24,000 tons and a high of 221,000. Purchases increased by as

Table 30. Price Levels in Years of Good and Bad Harvests

1979-1980 (Good Year)			
	Minimum Annual Average	Maximum Annual Average	Average Across Towns
Maize	2.51	4.14	3.08
Rice	5.00	8.16	6.96
Sorghum	1.88	5.30	2.96
Millet	4.00	6.00	4.73
Cassava	1.42	2.32	1.99

1980-1981 (Bad Year)

	Minimum Annual Average	Maximum Annual Average	Average Across Towns	% Change 1979/80-1980/81	
Maize	3.67 (3.01)	7.19 (5.90)	4.98 (4.08)	62	51
Rice	7.58 (6.16)	15.17 (12.44)	10.34 (8.48)	49	40
Paddy	3.24 (2.66)	5.83 (4.78)	4.23 (3.47)	82	67
Sorghum	3.17 (2.60)	6.05 (4.96)	4.68 (3.84)	58	48
Millet	6.79 (5.57)	7.17 (5.88)	6.95 (5.70)	47	39
Cassava	2.56 (2.10)	3.92 (3.21)	2.90 (2.38)	46	38

Source: Sigma One Corp.

much as 100,000 tons and decreased by over 60,000 tons between consecutive years.

In an effort to examine the effect of the parallel market on the volume of maize purchased by NMC, an estimate was made of the parallel market price of maize. This is nothing more than a proxy for the pattern of parallel market prices. However, it is their relation to official prices rather than their absolute level which is important. These estimates of parallel market prices were made by taking the unit import price of maize in dollars (c.i.f. Dar es Salaam) and converting it to local currency using quotations of the parallel market exchange rate. While these estimates apply to Dar es Salaam, their relative movements should reflect the price of some movements in rural areas. Some evidence for this is given by the average parallel market prices for maize in eight northwest towns which are very close to the prices predicted with the above estimation technique (Table 31). The estimates of the parallel prices reflect the marginal return to the producer of an additional unit of maize sold. Were they to overstate or understate the actual parallel market prices by a significant amount, trade flows across the national borders would be further stimulated, tending to bring domestic prices back to these values.

To test the hypothesis that NMC purchases are a function of parallel market prices, the sales to (or purchases by) the NMC were plotted against the ratio of the estimated parallel market price to the official producer pricing (Figure 5). It is seen that from 1970 to 1980 a close relationship existed. The ratio of the estimated border price in shillings to the NMC purchase price is a good predictor of the level of NMC purchases. These results underscore the inherent responsiveness of Tanzanian agricultural markets to changes in relative prices, and the predictable outcome of producers, consumers, and

Table 31. Tanzania: Relative Prices of Maize and NMC Purchases

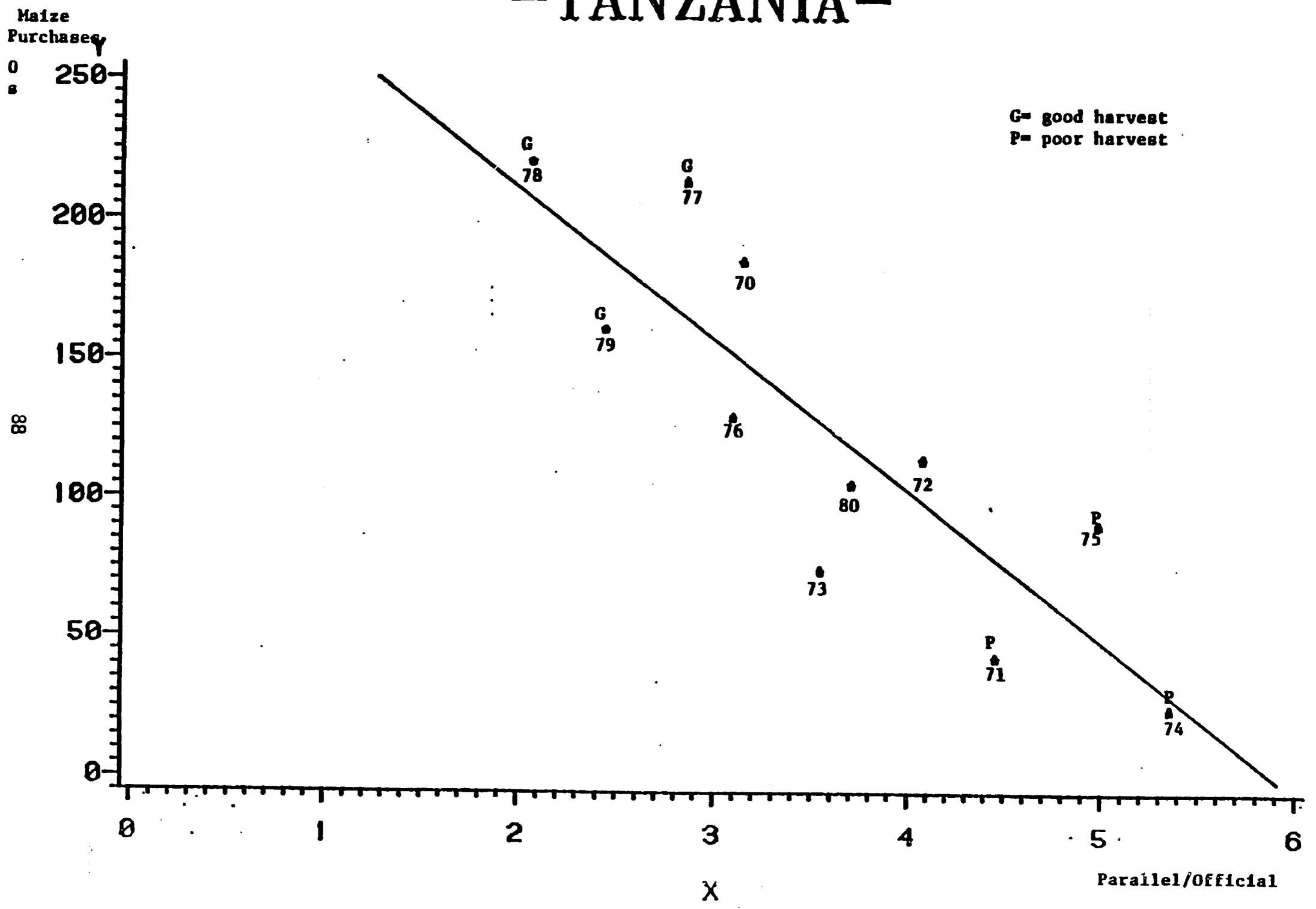
Year	Official producer price Tsh/kg	Est. parallel market price Tsh/kg	000m. t.	% Change from previous year
1970	0.26	0.82	185	
1971	0.24	1.07	43	-77
1972	0.26	1.06	114	+165
1973	0.33	1.17	74	-35
1974	0.50	2.68	25	-66
1975	0.78	3.89	91	+264
1976	0.80	2.48	129	+42
1977	0.85	2.43	213	+65
1978	0.85	1.76	220	+3
1979	1.00	2.45 (3.12 ^a)	160	+27%
1980	1.00	3.71 (4.98 ^a)	105	-34%

^aPrices in parenthesis are average parallel market prices for maize in eight towns in Northwest Tanzania.

Source: Sigma One Corp.

Figure 5.

NMC Purchases and the Relative Prices of Maize —TANZANIA—



merchants reacting to those prices. Preliminary ordinary least squares regressions with these data indicated statistically significant response to both the proxy for the parallel price and an indicator for good and bad years. Approximately one-fourth of the variance which could be explained was attributable to weather, and the rest to prices.

3.2.5 Intra-Year Price Movements

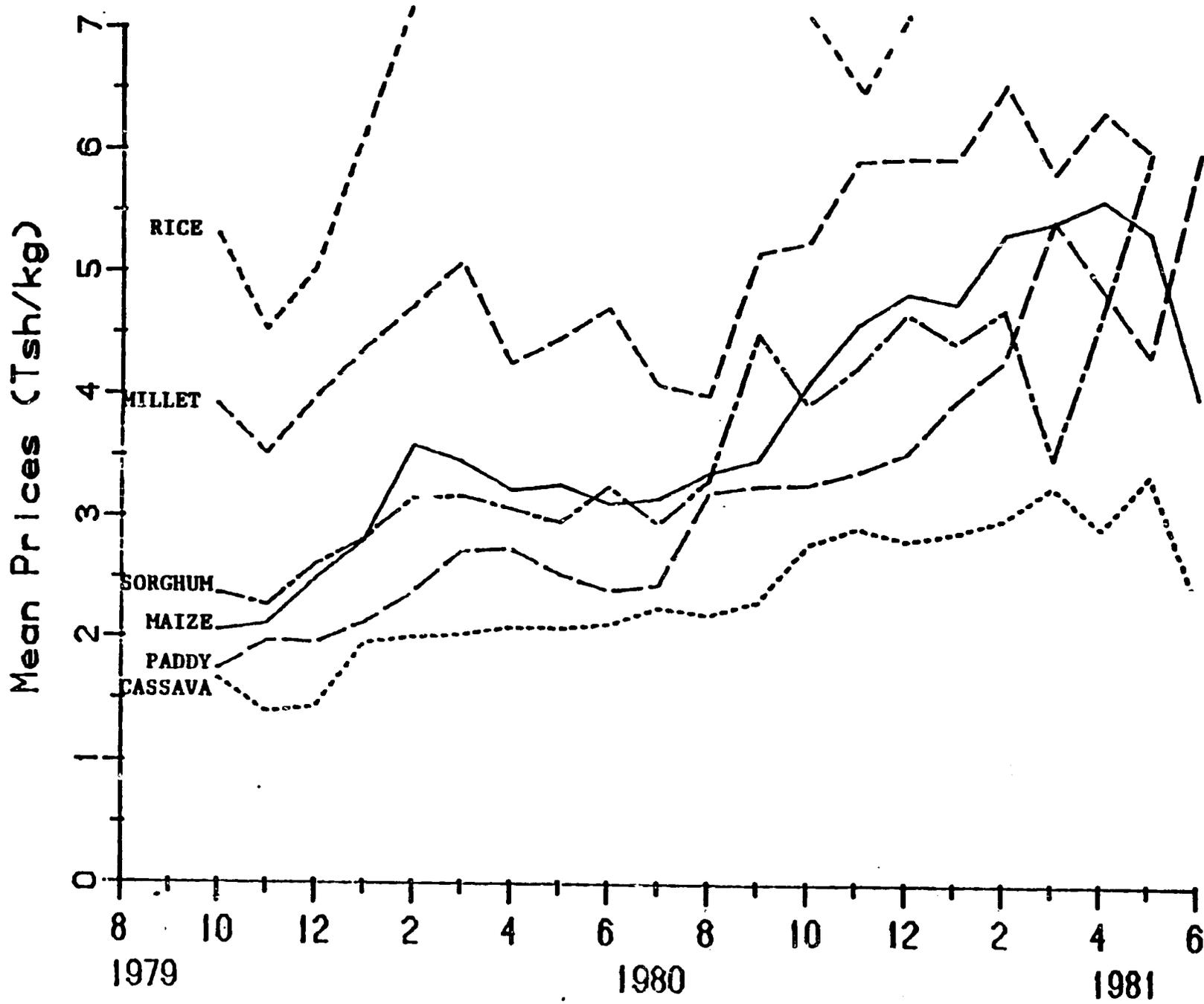
While official prices for grain stay constant throughout the marketing year, this is certainly not true for the prices on unofficial markets. An examination of within-year price movements on parallel markets demonstrates that the prices faced by consumers on these markets climb consistently throughout the year. Figure 6 shows the movements of grain prices for Lake Region towns from October 1979 to June 1981. Although the price level is higher during the second (poor harvest) year, the pattern for both years is similar. Prices begin to come down with the early harvesting in May and June and bottom out in the months after the main harvest in July and August. They begin to climb again around October and peak in the January-March period during planting and weeding.

One obvious but important implication of these movements is that the parallel market provides incentives to store grain past the harvest season. Producers of surpluses can realize a higher price, and farm households around the subsistence level need to store grain to avoid paying the high parallel market price. More grain is therefore available to non-surplus farm households than would be available in the absence of price fluctuations.

Further evidence for the pattern of sales in response to relative prices is provided by data from six villages in Kigoma (Table 32). During the harvest, parallel market prices fall to almost the level of the NMC buying

Figure 6.

Mean Prices By Month for Six Crops for Lake Region Towns



Source: Sigma One Corp

Table 32. Sales of Maize and Relative Prices:
Six Villages in Kigoma

Month	Maize to NMC (000 kg)	Sales to Parallel (000 kg)	Farm Sale Price Received for Parallel Market Sales relative to NMC Price
1977			
May	1	13	1.05
June	4	12	1.07
July	0	5	1.27
Aug	4	8	1.40
Sept	6	9	1.45
Oct	2	9	1.65
Nov	3	11	1.88
Dec	0	10	1.88
1978			
Jan	0	13	1.92
Feb	0	4	1.88
Mar	0	4	1.79
Apr	0	5	1.45
May	0	4	1.06
June	4	10	1.09
July	2	7	1.29
Aug	1	5	1.47

Source: Loft & Oldevelt, p. 103.

Table 32a. Sales to NMC in Six Villages in Kigoma

Proportion of total sales to NMC	Parallel market Price relative to NMC buying price
over 25	1.31
0- 25	1.40
0	1.61

Source: Loft & Oldevelt, p. 103.

price, and sales to NMC as a proportion of total sales reach a peak.¹⁵ This pattern is then reversed. Maize is stored for subsequent sale on the parallel market, and the volume of sales to that market peaks in January, and for almost 6 months (until the next harvest) no maize is sold to the NMC. While these data are drawn from a small sample of villages they reflect the nationwide pattern of sales to NMC, in which 90 percent of the total purchases by NMC occur between June and December. In the absence of seasonal differentiation in the prices paid by NMC, producers respond to the seasonal price pattern of the parallel market, storing maize from the plentiful, low-price months for sale in the deficit, high-priced periods. Such action helps to smooth out the seasonal peaks and troughs in maize prices and allocates the given supplies throughout the year.

The degree of price fluctuation in the northwest sample indicates, however, that returns to storage for sellers are very high relative to the crops' price at harvest. The maize price, for example, was 68 percent higher in February 1981 than in July 1980; the absolute difference was Tsh 2.17 per kilogram. Consumers perceived that the cost to them of buying grain in July and storing it until February was greater than Tsh 2.17 per kilo. This evidence supports the view that there is a shortage of good storage facilities in rural areas. MDB has indicated that the costs of farm-level storage are high relative to larger-scale storage facilities.¹⁶ Because storage of grain on any larger level must be either a village activity or an NMC operation, parallel markets are legally unable to use more efficient methods to store and resell other peoples' grain in the period before harvest. This has raised the price of grain to consumers unable to depend on the NMC and, along with the denial of legal access to transportation, increased the inefficiency and

instability of parallel markets. The data for these six villages reinforce the results that the proportion sold to NMC is in direct relation to the relative prices in official and parallel markets.

Another interesting trend, highlighted by the Pudsey data on parallel markets, is the high price of the "inferior demand" crops, sorghum and millet. Discussions of official Tanzanian grain markets have emphasized that urban demand for these crops is extremely weak; the NMC is unable to sell its stocks.¹⁷ Sorghum sold for TSH 2.96 and 4.68 over the 2 years, just slightly below the maize prices of Tsh 3.08 and 4.98. Millet prices were Tsh 4.73 and 4.98 during the 2 years, consistently higher than maize. These prices indicate that consumers in these areas, whether they use sorghum and millet for brewing or for food, do not consider grains "inferior" to maize. Prices reported in a National Food Situation Survey report for Mwanza city indicate that in May 1981 the parallel market price for maize was Tsh 5.00 per kilo, for red sorghum, Tsh 6.67 per kilo, and for millet Tsh 8.00 per kilo. In Magu District, the town market prices reported for a kilo of grain were Tsh 5.33 for maize, Tsh 4.67 for red sorghum, and Tsh 8.00 for millet.¹⁸ These data imply that there may be strong demand for drought staples in the Lake Region, and possibly NMC could concentrate its sales of these crops in the Northwest.

4. CONSUMPTION EFFECTS

4.1 Introduction

Policies affecting agriculture as a whole, and those which influence the buying and selling of agricultural products, have influenced the ability of Tanzanians in different socio-economic circumstances to maintain adequate food intake. Because there are no data currently available that precisely describe actual consumption on a national level, this chapter will focus on major population groups and discuss the effects of policy on the adequacy, composition, and stability of their diets. The distinctions drawn are somewhat arbitrary; it is hoped that the categorizations are an aid in understanding the important developments over the past decade. When finally available, the publication of results from the 1976-77 Household Budget Survey should provide some corroboration or rejection of our interpretations of the important trends. In the absence of this information, we present information on the food consumption patterns existing in 1969. Table 33 gives budget shares for food and cereals for different regions of the Tanzanian mainland. Table 34 presents the composition of cereal consumption for rural and urban areas in 1969. These data provide a baseine for the interpretation of the following results.

4.2 Consumption Levels in Urban Areas

Given the wide disparity between the official and parallel prices of major food grains, the availability of NMC supplies has been a crucial determinant of food consumption in urban areas. Consumption levels over the past 7 years have probably been higher and more stable in Dar es Salaam and other cities which have consistently received these supplies than in those areas which have not (Table 24). About 45 percent of the urban population lives in regions where the NMC provided less than half of urban food needs. Residents

Table 33. Budget Shares for Cereal Grains and Food
in Tanzania, 1969

	Total Food (% of income)	Cereals (% of income)	Cereals as a % of total food
<u>Rural</u>			
Arusha, Kilimanjaro, Tanga	53	12	23
Mtwara, Ruvuma	51	21	42
Mara, Mwanza, Shinyanga, Kagera	49	13	27
Kigoma, Tabora, Singida	63	26	42
Iringa, Mbeya	58	23	42
Coast, Dodoma, Morogora	55	23	42
<u>Urban</u>			
Dar es Salaam non-central	31	9	30
Dar es Salaam central	21	5	23
Other urban	37	11	30
Mainland Tanzania	50	16	32

Source: 1969 Household Budget Survey.

Table 34. Percentage Composition of Cereal Consumption, 1969

	Rural Areas	Urban Areas
Rice	12.6	23.2
Maize	65.1	48.4
Millet	3.9	-
Sorghum	13.8	0.6
Wheat	1.6	6.0
Other (includes baked products)	3.0	20.7

Source: 1969 Household Budget Survey.

of Dar es Salaam have probably been able to maintain their calorie consumption over this period. The official price of sembe was at or below Tsh 1.75 per kilo until June, 1981, making it possible for a family of four to purchase 15 kg. per person per month for Tsh 105 per month. From January 1980 until June 1981, the NMC sold sembe for Tsh 1.25 per kilo, allowing the same family to meet basic food requirements for only Tsh 75 per month. If the head of household received a minimum wage of Tsh 480 per month in 1980, the family's grain supply represented only 16 percent of total income.

Table 35 shows the percentage of the urban workers' income necessary to purchase 60 kg. of maize per month at parallel market prices. The prices used for 1980 and 1982 reflect an average across the country and time of year; further, the prices are for unmilled maize which still requires family labor or hired milling services before it can be consumed. The 1978 price is fairly low to reflect that grain was much more affordable in years of good harvests than bad. The results highlight the differences in purchasing power over food which are caused by differences in access to markets. If NMC supplies are available, between 16 and 26 percent of income is necessary; without NMC sup-

Table 35. Cost for Cereal in Urban Areas (based on 15 kg of sembe per person per month and a family of four with one wage earner)

Tsh.	1978		1980		1982	
	Official	Parallel	Official	Parallel	Official	Parallel
Sembe Price	1.75	2.00	1.25	4.00	2.50	5.00
Monthly Cost	105	120	75	240	150	300
Income	400	400	480	480	600	600
Income Percentage to Grain	26	30	16	50	25	50

plies 30 to 50 percent of income is required. The difference is so great that average food consumption in towns outside of Dar es Salaam is very likely to be significantly lower than in the capital. The 1969 Household Budget Survey shows only a 9 percent budget share for cereals in Dar es Salaam (African sections) and an 11 percent share in other urban areas. Indeed, at the beginning of the decade total expenditures on food were 31 percent in Dar es Salaam and 37 percent in other urban areas. These shares are almost certainly much higher in 1981. Because food markets outside the NMC are constrained, and even more importantly because the incentives to produce marketable surpluses have been decreased, it can be expected that food consumption levels are lower in these towns and cities than they were a decade ago.

The urban middle class, including merchants and government workers, have probably maintained their level of food consumption over the past decade, buying both from the NMC and on parallel markets. It is likely that this segment of the population has had preferred access to NMC stocks of rice and wheat, either through government allotments or special influence. In 1969, cereals represented only 5 percent of the total expenditures of central (presumably higher-income) Dar es Salaam residents. Food probably represents a larger share of total income for higher-income urban residents now, largely because of the very high parallel market price for rice, the preferred urban staple, and other preferred foods.

4.3 Consumption Levels in Rural Areas

In years of normal and good harvests, rural Tanzanians who produce substantially all of their own food have probably maintained their food consumption levels while reducing their consumption of non-agricultural goods and

services. This is due to decreased incentives to produce surpluses and to shortages of non-agricultural goods. It is also because farmers are unable to buy food from other sources when their need is greatest. In times of poor harvests these people have probably reduced their consumption because it was difficult to store previous surpluses in the form of assets, and to convert these assets to food on the markets to which they had access.

Rural people dependent on markets for part or all of their grain requirements, who rarely are able to buy NMC grain, have probably decreased their consumption due to the high prices and unreliability of parallel markets. This group includes those growing primarily cash crops and workers on estates. It is also true for villages that have diversified away from crop production. Households in these conditions represent at least 10 percent of the population of Tanzania. Many individuals have reacted to this situation by making food crops their primary economic activity, thus reducing their dependence on food markets. This has, of course, further reduced export crop production and diversification of the rural economy. Households which have maintained their level of food consumption have done so at a higher real resource cost. Whether or not some groups in the rural population have been able to maintain their levels of consumption, the agricultural and economic policies have forced the rural majority to dedicate the bulk of their human and material resources to securing food supplies. This has undoubtedly impeded the course of rural development as conceived in the Arusha Declaration.

There is some scattered evidence of the nutritional status of rural Tanzanians from a few food consumption and nutrition studies conducted in the past 6 years. These studies have been concentrated in the central area of the country, and most are more focused on anthropometry (weight and height rela-

tive to age) than direct food consumption. They are presented here because they highlight an important finding of the study--families which produce their own food are better able to feed themselves than families who depend on exchanging cash or services for food on the market.

Lalitha Seshamani studied food consumption behavior in four Iringa villages in April/May and October/November of 1979.¹ One village was an Ujamaa village with diversified production; one a village specializing in maize with high production; one village primarily supplied labor to nearby tea estates in return for cash; the fourth village produced onions for cash and, in times of crop failure, had come to depend on food aid for survival. She found that all the villages were well below FAO standards for calorie consumption. The village which was the highest in consumption of calories over the two observations was the one highly dependent on food aid; 51 percent of total calories in April/May (pre-harvest) and 29 percent in October (when only reserve stocks of aid remained) came from imported soy fortified sorghum grits. Calorie consumption as a percent of recommendations decreased from 79 percent to 70 percent as the food aid was phased out. Mean calorie adequacy in the maize producing village improved from 56 percent in the pre-harvest period to 81 percent post-harvest; in both periods between 60 and 70 percent of calories were from maize. Calorie intake improved slightly after harvest from 62 percent to 68 percent of standard in the village with diversified production, where around 80 percent of total calories came from maize. The village which supplied labor to the tea estates had the lowest average calorie consumption--49 percent of standard in the first period and 44 percent in the second--of any of the villages. Seventy percent of total calories in that village came from maize.

One trend which emerges is that maize was the staple for all villages unless food aid was available; in that village the 21 percent decrease in calories from decreased aid was compensated for by a 20 percent increase in share of calories for maize. There was no evidence of substitution of "inferior" millet or sorghum grain as a staple in families with low food consumption. The more frequently families in the study consumed maize, the larger the quantity consumed per meal.

Another finding concerns the status of non-food producing villages relative to those which were self-sufficient. One village dependent on cash income was very badly off in terms of consumption, and the other was almost completely dependent on aid. Where the primary economic activity was food crop production, people were much better able to provide for themselves. In the village which combined food production with other economic activities (timber, livestock), calorie consumption was somewhat lower than where maize production was predominant. In both of the villages which produced maize, it was consumed at more than 90 percent of all meals. About 20 percent more per meal was consumed in the period after the harvest than preceding, suggesting that storage was difficult.

Anthropometric examination of children found that the labor-supplying village and the village with diversified production had the highest incidence of malnutrition. This correlates with the low-calorie consumption of these villages.

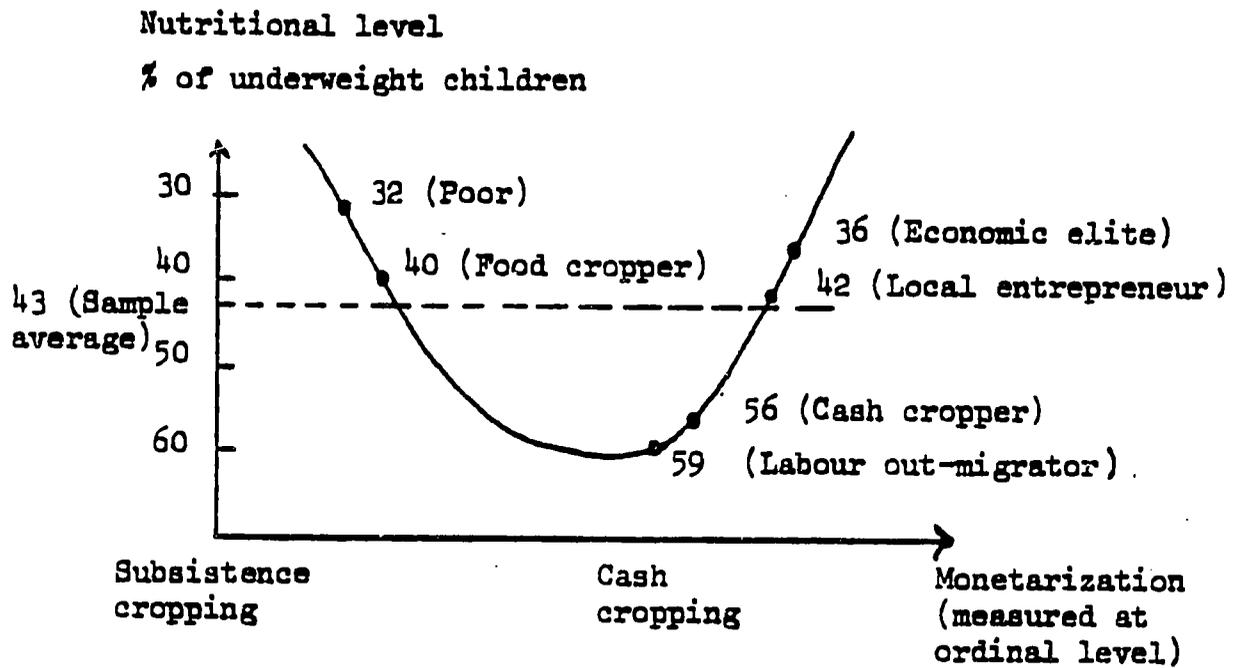
In the maize-producing village and the aid-dependent village income had no effect on calorie adequacy. In the other two villages, increased cash income from sources other than food sales did correlate with improved adequacy. Again, those oriented more towards cash production did not fare as well as those producing their own grains, although income seems to have made some marginal difference.

A study of a village in Kilosa District, Morogoro was carried out by Jonsson and Mgaza in January, 1977.² The village produced maize as its primary economic activity, and the anthropometric status of children under 5 years was quite good. Over 95 percent were above 80 percent of the standard in terms of weight-for-height, and more than two-thirds were above 90 percent of the standard. Classification by Gomez (weight-for-age) was somewhat lower; only 57 percent were above 80 percent of the standard and only 28 percent above 90 percent of the standard. Only 14 percent of the children were below 70 percent of the standard for weight-for-age. Ninety-five percent of the families in the village cultivated their own maize. There does not seem to be a significant correlation between size of harvest and anthropometric status. About 42 percent of the families produced some cotton as well, but there was no correlation between cash-crop production and nutritional status. There was a correlation between crop failure and malnutrition, although it was not very strong. There was also a weak correlation between increasing cash income and improved anthropometric status. Overall, the study found that in a village where people are largely growing their own staples, anthropometric status was fairly good even 6 months after the harvest.

A study of the nutritional status of children under 5 years in several villages in the Southern Highlands was carried out by O. Jakobsen in 1977.³ Malnutrition was measured anthropometrically and related to socioeconomic variables of the children's families. The study took place in an area where cash production was increasing; pyrethrum had displaced food crops on some land. A very strong correlation was found between the percentage of cash in the family's income and malnourished children; except for the economic elite, the children of subsistence farmers and those who raise food crops were better off

(anthropometrically) by a substantial margin than children of cash crop producers or labor migrators (see Figure 7).

Figure 7. Monetization and Nutritional Status



Source: Jakobsen

Malekela and Mahede report on a survey of a village in Kibaha District; unfortunately, no dates were specified.⁴ In this village cassava was the main staple, but production was inadequate to meet food needs. The villagers purchased additional food with cash income, 75 percent of which was derived from charcoal production. Maize, rice, and beans were the foods commonly purchased. Anthropometric status of children was low in this village; 60 percent of children under 5 years were below 80 percent of the standard for weight-for-age.

The above studies are by no means a representative sample; they are extremely limited in area and time. They do, however, tend to confirm a conclusion from the preceding section: rural families which produce their own staple foods are retaining significant quantities for their own consumption.

Families oriented toward cash-producing activities in all of these studies tend to have poorer nutritional status, measured both in calorie consumption and anthropometry.

The long-term trend toward preference for maize has continued in rural as well as urban Tanzania. The past decade has also seen a sharp increase in reliance on cassava in most areas of the country. This has been primarily due to peoples' perceptions of the necessity of keeping their own famine reserve. In urban areas, preferences for rice and wheat have continued to develop, although much of the supply must be imported. While most of the rice and substantially all of the wheat which have been imported have been aid or concessionary sales, continued demand for these commodities will place a strain on domestic production resources unless the aid continues.

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Chapter 2

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Chapter 3

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Chapter 4

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