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Food Problems and Prospects In Sub-Saharan Africa

The Decade of the 1980's

A Summary of the Report prepared for the
U.S. Agency for International Development/Africa Bureau
by the
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Africa and Middle East Branch

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I. THE FOOD SITUATION

Sub-Saharan Africa is the only region of the world where per capita food production declined over the past two decades. (Figure 1) A few countries improved on the record of the early 1960's. Most, however, showed moderate to severe declines. (Table 1) In 1978 per capita food production in Angola, Benin, Ethiopia, Ghana, Nigeria, Senegal, Sierra Leone and Upper Volta was less than 90% of the 1961-64 average.

Declining per capita food production exacts a high price in both human and economic terms. The human cost is inadequate nutrition, and sometimes large-scale starvation. In most Sub-Saharan countries, per capita calorie intake falls below minimal nutritional standards even in "normal" years. (Table 2) Even if total available food supplies were distributed equally and efficiently, there would not be enough to provide everyone with an adequate diet. In the eighteen countries where per capita calorie availability is less than 90% of minimal requirements, serious nutritional problems are unavoidable. When adverse weather or political disruption is added to this precarious "normality", major food crises result. Two years of drought, coupled with refugee flows, have led to outright starvation in several East African countries in 1980-81, despite an increase in food assistance to the region.

The economic price of inadequate domestic food production is a rising import bill. Governments in Sub-Saharan Africa have responded to lagging production by increasing imports. (Figure 2) During the 1960's grain imports posed little financial hardship. While the volume of imports doubled, the cost rose by only 50%. Stable low prices, combined with concessional sales, made imports a cheap and relatively secure way of meeting growing urban demand. In the 1970's, however, the situation changed dramatically. The cost of Sub-Saharan Africa's cereal imports doubled

Table 1--Indices of per capita food production, Sub-Saharan Africa, 1970-79

Region and country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979 ^{1/}
	1961-65=100									
Sahel:										
Mali	84	86	65	67	86	88	97	82	103	75
Niger	104	109	105	66	91	76	103	92	106	85
Senegal	64	87	56	68	90	100	87	59	88	68
Upper Volta	76	70	66	58	72	76	74	67	69	67
West Africa:										
Benin	92	89	88	53	89	84	85	88	89	82
Cameroon	97	102	97	93	97	96	97	96	97	97
Ghana	99	93	81	87	88	75	74	71	68	70
Guinea	107	110	109	108	98	94	101	93	102	101
Ivory Coast	107	113	105	109	120	142	129	125	124	132
Liberia	81	84	84	91	100	94	96	98	96	97
Nigeria	95	93	93	87	90	89	88	86	84	84
Sierra Leone	93	98	96	95	92	96	92	95	87	82
Togo	108	103	102	96	98	96	97	93	97	96
Central Africa:										
Angola	104	95	88	95	92	72	65	58	53	51
Zaire	119	109	106	112	107	105	106	103	97	97
East Africa:										
Burundi	117	119	119	117	98	113	110	109	108	109
Ethiopia	99	99	91	87	84	67	63	58	52	54
Kenya	96	91	99	97	96	102	113	117	111	110
Rwanda	123	122	115	118	112	121	119	121	119	119
Sudan	110	115	107	101	114	125	122	123	129	123
Tanzania	102	104	100	101	114	117	99	98	100	105
Uganda	95	92	87	82	79	81	77	73	76	68
Southern Africa:										
Madagascar	108	107	107	98	102	105	105	107	108	99
Malawi	96	108	118	109	110	97	101	95	96	90
Zambia	95	117	132	110	135	139	153	142	128	164

Sources: U.S. Dept. Agri. Econ., Stat., Coop. Service, Indices of Agricultural Production, 1970-79.
^{1/} Preliminary

Table 2--Calories per capita, selected countries in Sub-Saharan Africa, 1977

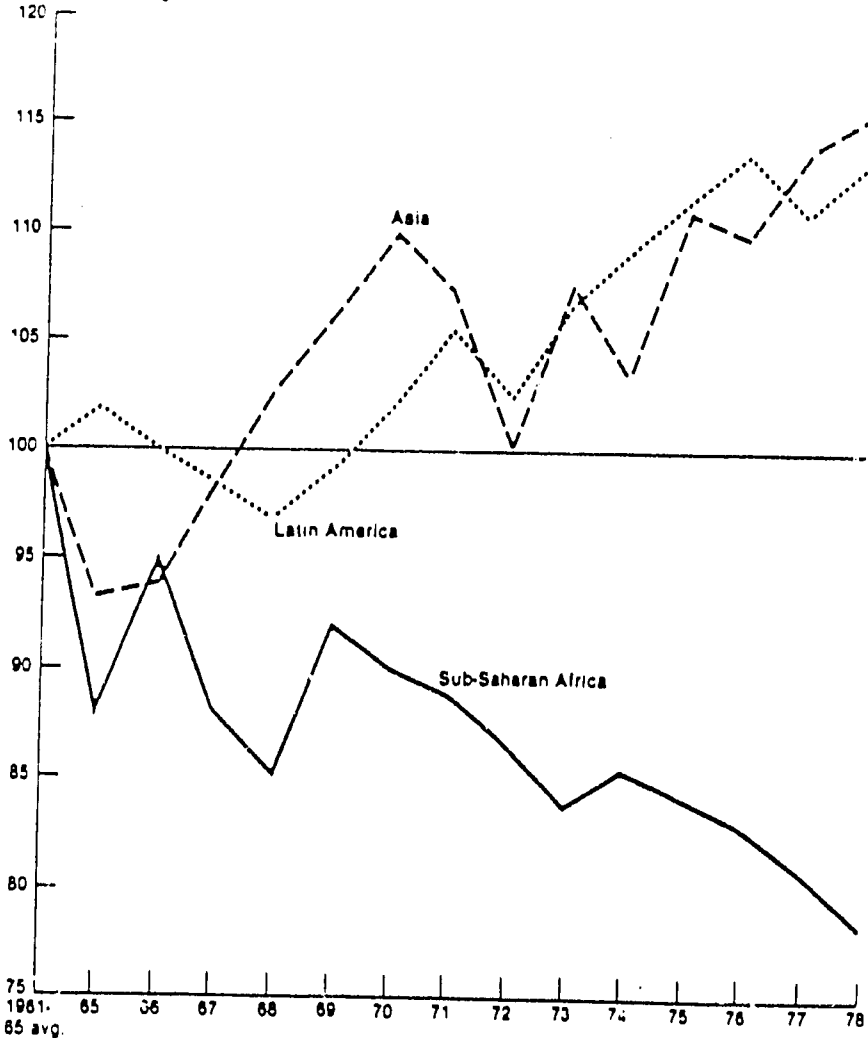
Region and country	Percentage of nutritional requirements	Region and country	Percentage of nutritional requirements
	Percent		Percent
Sahel:		Central Africa--Con.	
Chad	74	Congo	103
Gambia	--	Equatorial Guinea	--
Mali	90	Gabon	--
Mauritania	86	Zaire	--
Niger	91		
Senegal	95	East Africa:	
Upper Volta	79	Burundi	97
		Ethiopia	75
West Africa:		Kenya	88
Benin	94	Rwanda	98
Cameroon	89	Somalia	88
Ghana	86	Sudan	--
Guinea	84	Tanzania	93
Guinea-Bissau	--	Uganda	91
Ivory Coast	105		
Liberia	104	Southern Africa:	
Nigeria	83	Botswana	--
Sierra Leone	93	Lesotho	99
Togo	90	Madagascar	115
		Malawi	90
Central Africa:		Mozambique	81
Angola		Zambia	87
Central African Republic	99	Zimbabwe	108

Source: World Bank, World Development Report, 1980.

Figure 1

Sub-Saharan Africa
Index of Food Production per Capita

% of 1961-65 avg

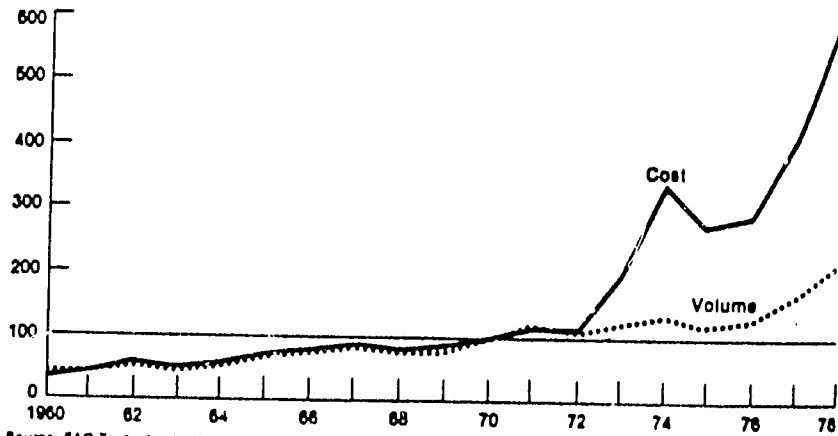


Source: ESCS Indices of Agricultural Production

Figure 2

Sub-Saharan Africa
Indices of Grain Imports: Volume and Cost

% of 1970



Source: FAO Trade Yearbook

between 1970 and 1978, while many countries experienced growing balance of payments problems. Higher prices for oil and manufactured imports as well as increased food prices contributed to the problem.

Our projections indicate that if per capita production continues to decline during the 1980's, both commercial and concessional import requirements will be higher in 1990.^{1/} If real per capita income and producer prices were simply maintained at 1975 levels, the import demand for cereals in 1990 would be about 11.5 million metric tons. High as this demand is, there would still be food needs unmet by either local production or commercial purchases. Providing minimally adequate diets for the 1990 population would require an additional 12.4 million tons, more than the total import demand. For many countries, it will be difficult to even maintain real 1975 per capita income levels. Real per capita income fell in all regions of Sub-Saharan Africa between 1975 and 1979. If this lower 1979 standard of living were maintained in 1990, cereal import demand would fall to 9.5 million metric tons, while unmet food needs would rise to over 13 million metric tons.

Even if we assume that there will be growth in real per capita income, the picture in several regions is disturbing. If growth followed the 1965-79 trend, import demand would rise to 18.5 million tons--11.9 million in West Africa alone. Because income growth is so skewed across regions, diets would be adequate in West Africa, but not in the Sahel, Central and East Africa. There an additional 9 million metric tons would be required to achieve adequate diets. If growth followed the post-1972 pattern (characterized by high oil prices and rising inflation), regional skewing would be even more extreme. The 1990 cereal import

1
Projections of 1990 import requirements were made for five regions in Sub-Saharan Africa--West, East, Central, Southern and the Sahel. An econometric model was used to project supply and demand for wheat, rice, corn, millet, sorghum and roots, tubers and plantains. Import demand is domestic demand minus domestic supply. A commodity's demand is a function of total income and price. A commodity's supply is a function of production (itself a function of the historical cropping pattern, producer price and risk) times yield.) Unmet food needs are the difference between cereals needed to supply 2300 calories/person/day and the demand for food. For details, see Chapter V.

demand would reach 21 million metric tons--over 18 million in West Africa. Unmet food needs would persist in other regions, and 10.1 million tons of cereals would be necessary to meet them.

II. WHY THE PROBLEM?

Why is Sub-Saharan Africa's food situation so precarious? Much of the problem lies on the supply side. Aggregate food production has grown very slowly--about 1.8% per year. This is below the growth rate for Asia or Latin America. Productivity has been low. African cereal yields are less than half those in Asia, while yields for pulses, roots and tubers are about two-thirds Asian yields. (Figure 3) Hence, growth in food production has depended heavily on increasing cultivated area, sometimes offsetting declining yields. In the Sahel, both area and yield declined significantly during the last decade. (Table 3)

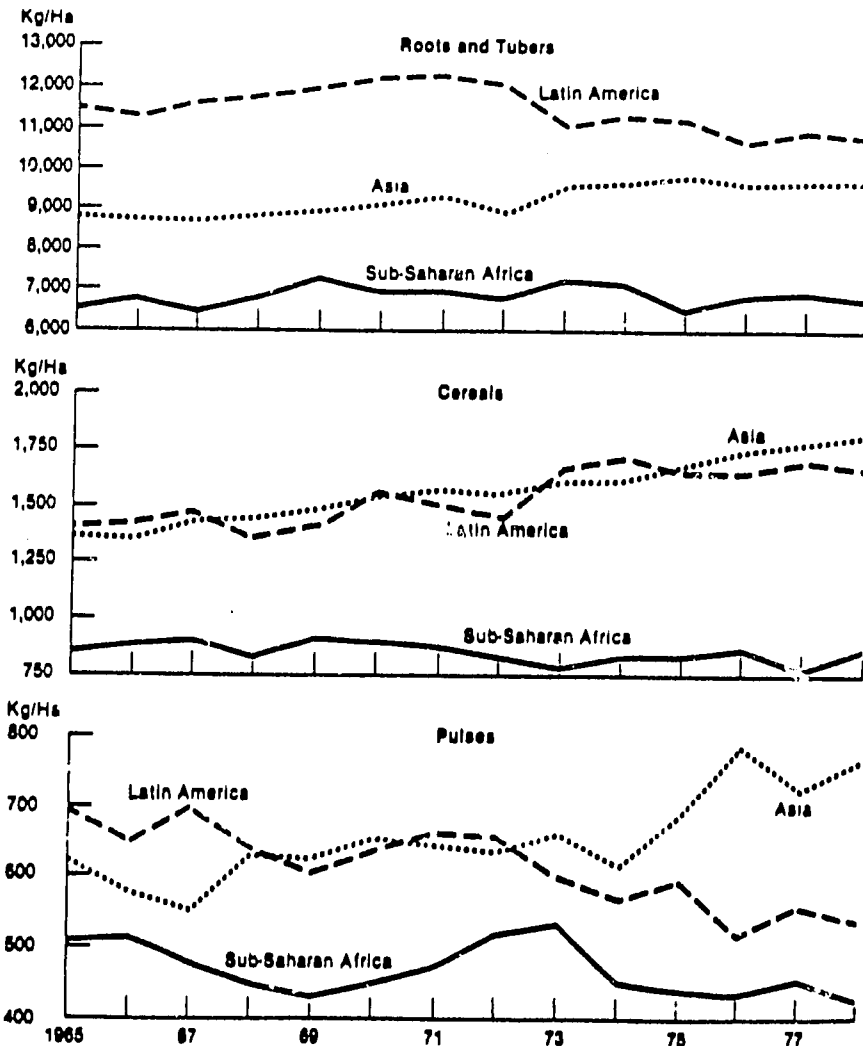
Production Problems

Part of the poor food production record can be explained by the structure of food production and the natural environment. While land tenure patterns vary, most food is produced by subsistence cultivators working relatively small holdings with few commercial inputs. Fertilizer use is lower than in either Asia or Latin America, and much of what is used is applied to export crops. Water control lags behind Asia and South America, with less than 2% of cultivated land under irrigation. The development of higher yielding varieties lags behind other regions, as does mechanization in agriculture. Basic food stuffs are produced in large part by human labor using simple hand tools. Disease, as well as cultural and economic conditions, limit the use of draft animals in many areas.

Subsistence cultivators are not insensitive to market conditions or unable to produce food for sale. Our analysis indicates significant responses to price changes in all regions except Central Africa. There transport problems make marketing difficult. Nevertheless, simply raising producer prices is not enough, even though

Figure 3

Sub-Saharan Africa, Asia, and Latin America
Yields for Staple Crops



Source: Latin America and Asia-FAO Production Yearbook, Sub-Saharan Africa-IBCS estimates

Table J--Area, yield, and production: Average annual growth rates,
Sub-Saharan Africa, 1962/64-1972/74

Commodity and region	Production	Yield	Area
	Percent		
Cereals:			
Sahel	-1.6	-1.3	-0.3
West Africa	.7	-.6	1.3
Central Africa	3.2	-1.6	4.7
East and Southern Africa	2.6	1.5	1.1
Roots and tubers:			
Sahel	-.7	-1.2	.5
West Africa	1.8	.4	1.4
Central Africa	1.4	-1.7	3.1
East and Southern Africa	1.7	3.3	-1.5
Pulses:			
Sahel	1.6	-1.9	3.5
West Africa	2.0	-2.6	4.8
Central Africa	1.9	-2.0	4.0
East and Southern Africa	-.9	-.2	2.1

Source: Food and Agriculture Organisation, Regional Food Plan for Africa, July 1978.

prices

have been low in most countries. Without better supplies of yield increasing technology, improved tools which allow for more efficient use of labor, and money to finance innovation, relative price differences will simply direct resources from one crop to another without quantitatively increasing agricultural output.

In addition, the natural environment poses some real constraints on quickly increasing food production. Many tropical soils are delicate, losing both organic matter and nutrients when exposed directly to the elements. Traditional cultivation practices, such as inter-cropping and broadcast sowing, were sound adaptations to the natural environment. So were complex rotation and fallowing systems. Nevertheless, these cultivation practices are beginning to reach their limits in many areas. In some regions, especially the Sahel, serious land degradation has already occurred. If African food production is to show sustainable increases, it is necessary to move to more intensive cultivation, with higher yields, that does not severely compromise the long-term productivity of agricultural land.

The physical basis for such a transition in Sub-Saharan Africa is not yet established. There has been no African Green Revolution like that in Asia. Breakthroughs in producing higher yielding varieties of African food crops, with the exception of maize, have not been made. Wheat is hard to grow in the tropics, except in the cool season under irrigation. It is therefore of minor significance except in a few countries with irrigated areas, such as Sudan, or countries with highland climates.

The most promising crop technology in Africa has been developed for maize, and the adoption of higher yielding varieties in many countries such as Kenya, Zimbabwe, Zambia, Malawi, and Tanzania has improved productivity.

In addition, crop technology cannot play as important a role in fostering an African Green Revolution as it did in Asia. Low-cost mechanical technology, capable of breaking labor bottlenecks, must play a critical role. The crop technologies associated with Asia's Green Revolution were land-augmenting, and land was the scarce factor of production. Adjustments in labor utilization followed, once the visible benefits of the package were known. In Sub-Saharan Africa, labor (especially during peak periods) is often the scarce factor of production. The first adjustment to be made in an African Green Revolution package must come in the form of labor utilization. There is likely to be a premium on technologies which increase the output per person-hour.

Achieving real production breakthroughs, then, may require some rethinking of agricultural research methodology. Farming systems research, which focuses not only on particular crops or machines, but also upon the interaction with farming practices, is an important step in this direction. Understanding traditional planting strategies, their perceived benefits, and especially the labor patterns they entail, is important in defining the areas in which innovation would be most fruitful. The crop-specific approach to agricultural research in Africa has, to date, resulted in no viable packages based on crop technology, in part because of problems in adopting crops outside the area in which they were developed, and in part because packages need to be tailored to the labor scarcity conditions of African agriculture. More intensive localized research may be the most productive research option over the next decade. There is no reason to hope for a quick break-through in producing physical production packages even if African countries make agricultural research a high priority program.

Production problems alone cannot account for the difficult food situation facing Sub-Saharan Africa. Two additional factors are important: the patterns of food demand being established, and the impact of government policies on the entire food production and distribution system.

Food Demand

In virtually every country, the diets are dominated by cereals, roots, tubers, bananas, and plantains. The movement away from direct cereal consumption, evident in many developed countries, is not imminent. However, there are clear urban-rural differences in diet. Wheat as a complementary food (in the form of bread) and rice as a staple are becoming increasingly important in urban areas. The urban markets for many traditionally grown foods such as cassava, millet, and sorghum, are limited.

Increasing population and rapid urbanization exacerbate weaknesses in African food production and distribution systems. Sub-Saharan Africa's population growth rate has increased steadily over the past twenty years--from 2.05 percent in the mid-1950's to 2.74 percent in the late 1970's. It now has the highest population growth rate of any developing region (Figure 4). Furthermore, population growth rates are projected to remain high over the next decade. According to United Nation's projections, Africa is the only developing regions in which population growth rates will continue to increase throughout the 1980's. They are not expected to level off until about 1990, when they will average about 3 percent per year.

Urbanization patterns also contribute to current food problems, since the interaction between urbanization and income growth creates a structure of demand which is difficult to supply from local production. Sub-Saharan Africa is presently the least urbanized region in the world, with less than a quarter of its people living in cities. The urbanization rate is high, however. Urbanization rates of 5 percent per year are common, implying that the urban population will double in fourteen years (Table 4). Urbanization puts a premium on convenience foods, such as bread, rice, and processed foods, which are often difficult to supply from local production. Few countries can produce wheat in any significant quantities; rice production is often expensive--both in relation to world market prices and the cost of producing other staples. Commercial processing of local foodstuffs is not well developed. Meeting the urban food demand

Figure 4
Sub-Saharan Africa, Asia, Latin America
Population Growth Rates, 1950-2000

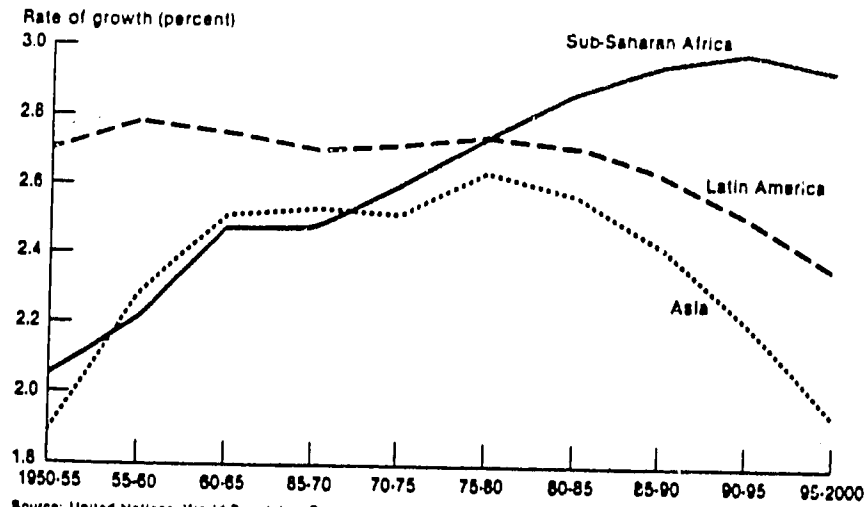


Table 4—Urbanization in selected countries, Sub-Saharan Africa

Country	Percentage of population in urban areas, 1980	Urban population growth rate, 1970-80
Percent		
Sahel:		
Chad	18	6.7
Mali	20	5.5
Mauritania	23	8.6
Niger	13	6.8
Senegal	25	3.3
Upper Volta	9	4.1
West Africa:		
Benin	14	3.9
Cameroon	35	7.5
Ghana	36	5.2
Guinea	19	6.1
Ivory Coast	38	8.2
Liberia	33	5.6
Nigeria	20	4.9
Sierra Leone	25	5.6
Togo	17	5.6
Central Africa:		
Angola	21	5.8
Central African Republic	41	4.9
Congo	37	3.2
Zaire	34	7.2
East Africa:		
Burundi	2	3.6
Ethiopia	15	6.9
Kenya	14	6.8
Rwanda	4	5.9
Somalia	30	5.1
Sudan	25	6.8
Tanzania	12	8.3
Uganda	12	7.0
Southern Africa:		
Lesotho	5	7.8
Madagascar	18	5.2
Malawi	9	6.2
Mozambique	9	6.8
Zambia	38	5.4
Zimbabwe	23	6.4

Source: World Bank, World Development Report, 1980.

from local resources will require better procurement and marketing policies, improved infrastructure, more progress in processing and storing local staples, and active attempts to shape the tastes and preferences of urban consumers.

Policies

Most countries have policies directly designed to influence consumer choice, as well as to affect food production, distribution and trade. Many countries use direct controls to maintain consumer prices below the free market price. Such controls apply generally to rice, wheat and maize, less so to cassava, tubers, and plantains. There is a continuing tension between maintaining low retail prices and providing appropriate incentives to producers through increased farm-gate prices. In practice, price policies have proved to be more consumer-biased than producer-biased, generally because urban consumers are more important politically. There are some signs that these biases are changing, since producer prices have been increased and retail prices for basic food-stuffs have sometimes followed suit. Nevertheless, it will be hard for governments facing serious budget deficits to sustain increases in real farm-gate prices which would produce a net return to farmers capable of financing improved production methods.

Governments frequently attempt to maintain lower retail prices by becoming involved directly in food marketing. Some (those of many Sahel countries, and Kenya, Somalia, Tanzania, and Madagascar, among others) have a legal monopoly on marketing some staple food products. However, governments rarely achieve monopoly control of the market, even with the help of procurement quotas. Low retail prices generally induce government marketing agencies to procure at low prices in order to preserve their margins. Low prices contribute to poor records in procurement (late payments and other forms of mismanagement are other contributory factors), which in turn result in shortages. Black markets and hoarding develop. The end result is that significant numbers of consumers have to pay high "black market" prices for scarce commodities, while a favored few enjoy subsidized consumption at very low prices. The inequities in this system are apparent.

The counterpart to government attempts to intervene in consumer markets on the production side is the disincentive to production. Farmers, seeing little profit in growing food crops for sale in government-controlled markets, grow just enough to feed their families, and grow export crops for sales, or use their labor elsewhere other than in agriculture by migrating.

Government policies also affect the distribution of modern inputs. Fertilizer is subsidized and delivered through government agencies throughout the Sahel and in several countries in West, East, and Southern Africa. In general, however, subsidized inputs reach only a fraction of the countries' farmers, and uncertainties about availability, combined with delivery delays, often limit their impact.

Pricing and procurement policies which are inconsistent with other policies can be very costly. Policies designed to increase domestic production can be easily undermined by food import policies, especially when import margins are higher than those obtained by handling domestic production. Continued imports, combined with local stockpiles in other parts of the country, can arise.

Additional policy complications come from weather-related production variations. Because there is little irrigated food production, crop yields vary significantly. Higher producer prices, combined with exceptionally good weather, have produced domestic surpluses in several countries. Without adequate storage facilities, these countries are often faced with the choice of losing much of the crop, or attempting to export it (frequently at a loss). Kenya, Tanzania and Senegal all had this experience shortly before the onset of serious drought. On the other hand, when weather is poor, quantities procured by governments drop by more than the fall in production, as subsistence farmers hold back a larger share of the crop to meet their own needs. Import requirements grow, often at the same time that prices are increasing. Better coordination between storage policies, producer prices, and trade policies is required to provide better domestic supply management.

In short, governments' policies often fail to encourage production and marketing of local food commodities. In the Sahel, this fact is increasingly being recognized, and the redirection of the role of official agencies and the acceptance of a useful role for private traders are important steps in changing this situation. However, it will be necessary to make substantial improvements in supporting services such as transportation, storage, and information networks to foster an effective and efficient marketing system. In some countries, because private trade networks are less well developed, government marketing agencies have a legitimate role to play.

Investment in agriculture and in rural areas has been low in Sub-Saharan Africa. From colonial times to the present more attention has been given to the promotion of export crops such as cotton and cocoa than food crops. The lack of goods and services in rural areas, the orientation of education and poor return from farming have contributed to migration to cities. Weak infrastructure, particularly for transportation, is a major constraint on expanding production. Timely marketing of crops and delivery of inputs are difficult. Managerial capability also is limited. The operations of government marketing organizations and large scale farming enterprises for example have been hampered by managerial problems.

III. CONCLUSIONS

The study draws the following specific conclusions from its analysis.

1. In the near term, the coordination of government policies in food production, marketing and trade offers the best hope of meeting food needs in Sub-Saharan Africa. At the same time, it must be recognized that the timing of the application of these different policies will need to vary from one region to another, and that there are countries where the realization of production potential depends far more on a single special factor (such as provision of inputs in Kenya) than on others. This question of the coordination of policies and their timing does not respect national borders: a policy success in one country may have repercussions, beneficial or harmful, in neighboring countries.

2. Slowing down the shift of urban consumer tastes to non-domestically produced foods and introducing new processing technologies for domestically-produced foods to make them more palatable and convenient afford some scope for diminishing imports. Programs along these lines will have a beneficial impact in terms of the attainment of self sufficiency in food by some countries, and of generating employment in all countries where they are tried. The process of servicing urban markets, viewed by us as a necessity, can thus stimulate economic growth in rural areas.

3. The transformation of the subsistence sector, in ways that raise living standards and respect social values, should, and indeed must, be a longterm goal of African governments, both from the point of view of increasing food production and of generating national economy. It must be based on improving productivity in food production, which is the key to reversing deteriorating trends of food supply. Increased productivity in food production can be expected to lead, either directly or indirectly, to higher rural income, and decreased drudgery of farm work. Rural purchasing power in turn could induce an infusion of consumer goods into rural areas, and act as a further stimulate to higher productivity. The isolation of the subsistence sector will then have been broken.

4. The study takes a time frame of ten years. But in the longer term, a solution of the food problem in Sub-Saharan Africa probably depends on basic investments in education and research. Policies and programs suggested above will inevitably be self-limiting unless they are backed up by an appropriate set of local institutions. Such institutions must bear the burden of raising the presently low status of agriculture so as to upgrade human capita in food production, and of finding the answers to basic, unanswered questions about the capability of soils and crops to sustain a highly productive agriculture. Investments of this nature often do not have a high annual pay-off, which may make them unattractive in the short term. The alternative, however, is an indefinite continuation of ad hoc policymaking.