Constraints Facing African Countries to Provide Needed Food

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Abstract: An analysis of the staple grain economies of ten African countries shows that declining per capita food production has not been offset by increased imports. The impact of weather variation, particularly drought, has been severe, reducing annual production by as much as 50 percent at times. Policies affecting food availability have undergone changes as governments seek to stimulate production. Increased producer prices, urged by donor countries, have elicited a positive response. The magnitude of price response varies among countries but in general provides support for those who argue that raising prices is an incentive to producers. Lagging domestic production has increased food import dependency. At the same time, deterioration of the domestic economies, combined with global factors, has led to financial crises. As food production has fallen, a part of the dwindling supply of hard currency has been spent on the purchase of food. Governments increased imports in response to production shortfalls. Increased foreign exchange earnings also led to greater imports. Food aid did not significantly reduce commercial imports. Adjustment by means of food imports will be slow in countries with historically low volume of imports. Price policy reforms and increased export earnings will lead to greater improvements in food consumption in those countries with better production performance.

Introduction

In the past decade, sub-Saharan Africa has been characterized by declining per capita food production and high year-to-year variability. In the most recent 3-year period, numerous countries in eastern, western, and southern Africa have experienced drought and other conditions leading to severe food shortages, and in some cases famine. The food situation in sub-Saharan Africa has come to be recognized as a chronic problem that is likely to continue to prevail in the future unless its root causes can be identified and corrected.

This paper explores some of the probable causes of chronic food shortages, quantifies the responsiveness of production and import levels to economic forces, and projects food availability under selected sets of possible conditions. The analysis focuses on 10 sub-Saharan countries: Mali, Niger, and Senegal in western Africa; Ethiopia, Kenya, Sudan, and Somalia in eastern Africa; and Lesotho, Mozambique, and Zambia in southern Africa.

Production Characteristics

The analysis reported on in this paper is restricted to grains (millet, sorghum, wheat, maize, teff, and barley), which account for more than 60 percent of total food consumption in the ten countries covered by the study. Productivity is generally low, whether measured on a per unit-area-cropped basis or on a per person-hour basis. Country growth rates of grain production during 1966-83 varied from -2.85 percent per year in Mozambique to 4.2 percent per year in Sudan. Three of the countries had negative growth rates, and three had growth rates lower than 1 percent. Given population growth rates of about 3 percent per year, only Sudan (and possibly Niger) were able to maintain per capita food production levels (Table 1). The major portion of production changes in 1966-83 can be attributed to changes in area cropped rather than to changes in yields.

Food production is subject to great variability due to drought, which has played a major role in causing food shortfalls in the ten countries. Nine of the ten countries (not Lesotho) are located in the semiarid tropics where rainfall is highly variable. Food crops are, by and large, produced under rainfed conditions, and weather variability greatly influences crop yields. Grain production variability, measured by the coefficient of variation from trend, is great; coefficients of variation range from 11 percent in Kenya to 25 percent in Lesotho (Table 1). During 1966-84, the ten countries faced serious drought in one out of every three years. The impact of drought varies by country and year. The resulting production shortfalls ranged from a minimum of 10 percent to a maximum of 50 percent among the ten countries (Table 1).

Government Policies and Programmes

While natural conditions have contributed to the slow growth of food production in the ten countries, counterproductive domestic policies and ineffective administrative systems are also important. In the early years following independence,[2] the relative share of government spending on the agricultural sectors of the countries declined. In the agricultural sector, governments tended to

Table 1—Food Production and Price Responsiveness, 1966-83

	Production growth (%/yr)	Drought shortfall (%)	C.V. (%)	Price elasticity (negative) Production	Area
Ethiopia	1.5	10-40	12	0.19-0.53	0.00-0.76
Kenya	1.9	12-45	11	0.07-0.46	0.00-0.35
Lesotho	-2.4	23-44	25	0.00-0.39	0.15-0.16
Mali	-0.5	14-30	13	0.00-0.35	0.07-0.23
Mozambique	-2.9	20-50	14	0.12-0.23	0.10-0.12
Niger	2.3	20-26	20	0.11-0.14	0.09-0.29
Senegal	0.5	13-41	23	0.11-0.32	0.40-0.43
Somalia	0.6	13-40	12	0.03-0.10	0.08-0.14
Sudan	4.2	20-34	19	0.22-0.34	0.23-0.33
Zambia	1.1	13-46	15	0.21-0.43	0.06-0.31

favour the establishment of large-scale farms in the expectation that the multiplier effect of that type of production would "trickle down" to the majority of smallholders relatively quickly. That expectation did not materialize. Increasing rural poverty and unemployment raised the question of whether the impact of government interventions was, on balance, beneficial or harmful.

In the early 1970s, the widespread nature of rural poverty forced governments to modify their policies. The policies, intended to contribute to development, were based on increasing the government's role in providing a whole range of economic services (e.g., distribution of inputs, marketing of outputs, and provision of credit). In the first half of the 1970s, after the first oil price rise, and after a substantial rise in world food prices, countries began questioning their agricultural policies.

Low productivity growth was explained by insufficient producer incentives. Governments adjusted their pricing policies in varying degrees. A sharp increase in nominal prices for major food commodities followed (e.g., producer prices for maize in Zambia, sorghum in Sudan, and millet in Mali increased by 50, 140, and 60 percent, respectively, in 1974-76). However, these producer price increases were largely offset by increased inflation. The purchasing power of farmers in many countries fell. Producer prices, deflated by the consumer price index (CPI), and reflected in rural-urban terms of trade, declined or stagnated for all major commodities in all ten countries. For example, in the Sudan during 1977-83, the 160 percent increase in the official producer price of sorghum and the 330 percent increase in the CPI resulted in a 50 percent decline in real producer prices.

Many donor countries, including the USA, continue to encourage the food deficit developing countries to provide incentives to producers through high commodity prices. The success of that approach depends on positive production responses to high farm prices. To test for the existence of such responsiveness, we estimated price elasticities for area and production of each type of grain. Prices were lagged if they were not announced prior to the planting season, and dummy variables were used to represent the occurrence of drought. Cross price elasticities were estimated, but were not significant because of high correlation among commodity prices due to government manipulation of all commodity prices.

The results indicate that producers responded positively to changes in real prices. The magnitude of response varied among countries and commodities (Table 1). The price response of area was greater when yields were declining. When yield growth was positive, production price elasticities were higher. Countries with a better historical agricultural performance in terms of production growth rates and food self-sufficiency showed more responsiveness to prices. Our results provide support for those urging the use of producer price incentives as a means of improving food availability.

Food Imports

As in most developing countries, the export sectors of the ten countries covered by this study are based on a single primary commodity, or at most a very few primary commodities, that accounts for a significant proportion of GDP, government revenue, and export earnings.

The oil price shock of the mid-1970s, followed by economic recession, reduced the purchasing power of the industrial world. By the end of the 1970s, quantities of exports from the ten countries were no greater than in the mid-1960s, reflecting reduced world demand for primary commodities. The modest export growth of the 1960s was in part offset by a decline in terms of trade during the 1970s. The reduction in real export earnings was also accompanied by instability of export prices and volume, aggravating the countries' financial problems. During 1966-82, slow and unstable growth of agricultural production required that critically short foreign exchange be used for food imports, even in years of good weather. All ten countries had positive rates of growth of food imports. Although the rate of import dependency changed through time and varied among countries, import volume increased as much as 10 to 20 fold during the 1966-82 period. In Kenya, Sudan, and Niger, with better agricultural performance, the high import growth is from an initially very low base, but the alarming aspect is the likely magnitude of food import needs in the future and the gloomy prospects for earning foreign exchange.

The increased food import needs means competition among imports of food, other raw materials, and capital goods for limited foreign exchange. How large should the overall budget allocation for the food sector be? The political risk involved in incurring massive food shortages, particularly in urban areas, is a threat to African governments. On the other hand, budgetary pressures arising from stagnant economic growth limit government spending for food subsidies.

A simple least squares regression was used to quantify the relationship between quantity of food imports (dependent variable), domestic production, foreign exchange earnings, world food prices, and food aid received. The sign and magnitude of the coefficients indicate the percentage change in commercial food imports resulting from a 1 percent change in each of the variables (Table 2). Kenya, Sudan, Mali, and Ethiopia, with lower import dependency, are more responsive to production shortfalls (elasticities of 2.30 to 2.87) than countries with higher import dependency (elasticities of 0.10 to 0.82). Increases in foreign exchange earnings led to a low volume of import adjustment in Senegal, Lesotho, and Mozambique, with chronic food problems and high import dependencies.

The degree of substitution between food aid and commercial imports varied by country and year. Food aid is used as a means of obtaining budget relief or supplementing commercial imports to improve the diet of the people. Consequently, food aid did not reduce commercial imports much and was not a strong substitute for imports, except in the case of Ethiopia. World prices did not significantly affect import levels. Decisions about imports were apparently made more on the basis of need (either emergency or chronic) and ability to pay. Such purchases were thus made almost irrespective of world price variations.

Implications for Food Consumption

Although the ten countries tended to increase food imports, their import volumes were less than their production shortfalls, which led to a decline in per capita availability. Overall, their food balances were low (sometimes below the minimum requirement) and consumption varied significantly from year to year. When drought and strife suddenly depressed food availability levels below the historical trend, per capita food consumption declined and raised the threat of famine.

Table 2—Import Elasticities for Cereals: Changes in Imports Due to a 1 Percent Change in Production, Foreign Exchange, and Food Aid

	Production	Foreign exchange	Food aid
Ethiopia	-1.15	1.70	-0.61
Kenya	-2.39	1.22	-0.02
Lesotho	-0.23	0.51	0.03
Mali	-2.87	1.26	0.13
Mozambique	-0.53	0.50	0.15
Niger	-1.07	0.86	0.01
Senegal	-0.37	0.14	0.23
Somalia	-0.82	0.86	-0.07
Sudan	-2.30	1.04	-0.04
Zambia	-0.87	1.44	-0.02

Table 3—Expected Food Consumption After Three Years Under Alternative Conditions

	Food situation based on historical trends:		Food availability under the following conditions:		
	Self-sufficiency ratio (%)	Calorie availability/ requirements (%)*	20 percent production drop due to droughtö	10 percent increase in foreign exchangeö	5 percent increase in producer priceö
Ethiopia	0.90	83	82	102	105
Kenya	0.94	86	88	106	106
Lesotho	0.47	98	82	101	101
Mali	0.96	68	86	103	101
Mozambique	0.56	68	96	101	101
Niger	0.94	99	82	101	111
Senegal	0.65	98	89	105	104
Somalia	0.42	89	98	111	101
Sudan	1.00	85	87	103	103
Zambia	0.85	95	87	108	106

[*Calculated on the basis of the proportion of cereal in the total diet of the country's population as reported in FAO food balance sheets. öPercent of historical trend.]

To assess the likely future of food consumption in the ten countries, the historical trend was projected into the future, providing a base scenario. The effects of several developments were then estimated for a period of 3 years (the period of projection follows our expectation of drought occurring every 3 years). The possible developments considered were: if a drought led to a 20 percent drop from trend food production; if foreign exchange earnings grew 10 percent annually; and if real producer prices were raised 5 percent each year. For the simulated period, the share of food aid in total imports was assumed to be the same as during 1981-83. The self-sufficiency ratios derived from trend projections of production and imports, and from nutritional adequacy based on a minimum of 2,340 calories per day, are shown in Table 3. Given those projections, 6 of the ten countries would not import more than 20 percent of their consumption. Lesotho, Mozambique, Senegal, and Somalia would be highly dependent on imports. The average nutritional level would be lower than requirements based on historical trends.

The results indicate that food consumption would be highly sensitive to drought. In all countries, a 20 percent reduction in agricultural production would severely decrease food availability. Even with a sizeable import response to the production shortfall, consumption would decline significantly from the trend forecast. If we were to add the impact of the drought to countries already consuming below the nutritional norm, the impact would probably be severe because of distributional skewness. The impact of drought in general would be more profound in countries with a history of higher self-sufficiency. For example, in Niger and Ethiopia, commercial imports would not compensate for more than 2 percent of a production shortfall of 20 percent. Those countries have limited capacity to import and therefore cannot adjust quickly.

Improved export earnings would lead to an increase in food imports. However, in contrast to the severe changes brought about by drought, financial improvement would increase food availability only moderately—about 4 percent on the average. In Zambia and Somalia, the increase in foreign exchange earnings could increase consumption by 8 to 11 percent. If the ten nations reformed their pricing policies, food availability would improve, especially in countries with better historical food sector performance. Price increases are expected to be effective in the short term, under normal weather conditions.

Notes

[1]Economic Research Service, US Department of Agriculture.

[2]Ethiopia did not have a colonial period *per se*, although it was controlled by Italy during 1936-41.