
National and Regional Self-Sufficiency Goals

Implications for
International Agriculture

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The Evolution of Food Self-Sufficiency Policies in West Africa

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Although increasing food self-sufficiency has been a stated priority of most West African countries since independence, the ability of the region to produce food for itself has steadily declined over the past thirty years (Table 5.1).¹ Whereas world food production per capita increased 38 percent over the period 1948–1950 to 1983–1985, in West Africa it *decreased* by 20 percent, a decline even greater than that of the continent as a whole—and, over this period, Africa was the *only* continent where per capita food production decreased. The performance of West Africa was strongly influenced by food production and demand trends in Nigeria, which contains about half the region's population. (Because of poorly developed statistical services in this region, the figures on food production and population cited in this chapter are weak, and must be interpreted cautiously.)

As a result of lagging staple food production and growing demand, food imports into the region soared. Between 1974 and 1986, the volume of total cereals imports into the region increased by 66 percent, reaching 3.4 million metric tons.² Over the period 1964–1966 to 1983–1987, the value of West African imports of agricultural products and inputs increased roughly twice as fast as its exports of these products (Ghersi et al. 1989). As a consequence, the rate of self-sufficiency in cereals fell from 87 percent in 1974/75 to 80 percent in 1984/85. Even with a 20 percent jump in grain production between 1984 and 1985 due to extremely good rains, the rate of self-sufficiency in 1985/86 stood at only 85 percent.

Not only did the quantity of food imports increase, but the composition of staple food consumption shifted away from traditional cereals such as millet and sorghum toward rice and wheat. Between the periods 1961–1965 and 1979–1983, wheat and rice grew from 15 percent of total cereal consumption in the region to 31 percent, with more than half of these cereals imported. Over that period, per capita consumption of rice and wheat increased by 16 kilograms, whereas that of millet and sorghum (almost all of it locally produced) fell by 22 kilograms (Delgado and Reardon 1987).

Table 5.1 Comparative Evolution of the West African Food Situation, 1948-1985
(percentage change between 1948-1950 and 1983-1985)

Region/Country	Area	Yield	Production	Population	Production per Capita
World	22	117	166	92	38
Africa	61	30	109	148	-15
West Africa	68	24	108	160	-20
Nigeria	79	14	112	189	-27
Rest of West Africa	58	33	105	130	-11

Sources: Area, yield, and production figures are calculated from data presented in Ghersi et al. (1989). Population figures are midyear estimates for 1950 and 1985 and are taken from United Nations (1979, 1986).

Practically no wheat can be grown in West Africa, and the region produces less than half its rice. In contrast, rates of self-sufficiency are high for millet, sorghum, and maize. One of the key policy issues for the region is whether it is possible to influence the structure of demand away from these imported commodities toward staples in which the region has a stronger comparative advantage, thereby increasing overall staple food self-sufficiency.

To provide a more detailed look at the mechanisms driving trends in self-sufficiency in this vast region, this chapter focuses on two parts of West Africa where different factors have been at work: (1) Nigeria, where the oil boom and macroeconomic policies radically changed both supply and demand conditions in the food economy, and (2) the semiarid Sahelian countries, just south of the Sahara, where frequent droughts have played a major role in influencing self-sufficiency policies.

BACKGROUND ON THE REGION

It is dangerous to generalize about West Africa, an enormous, highly diverse region, including seventeen countries and covering an area nearly equal to that of the continental United States. Climatic zones range from the arid Sahara in the north to tropical rainforest in the south. The pattern of agricultural production consequently varies widely, from shifting cultivation, tree crops, and plantation agriculture in the south to nomadic herding in the north. Rice, roots, and tubers predominate as staples in southern coastal regions, and dryland cereals, such as millet, sorghum, and maize become increasingly important as one moves north. Consequently, focusing entirely on grain self-sufficiency may be misleading. Whereas cereals account for over 70 percent of total calorie consumption in inland countries such as Mali and Burkina Faso, they make up less than 40 percent of total dietary calories in many of

the humid coastal states, such as Ghana and Togo, where roots and tubers are more important (Ghersi et al. 1989).

Ethnic, cultural, and political differences also divide the region. The colonial powers balkanized much of West Africa, imposing artificial borders and divergent monetary, political, and trade regimes. These differences have persisted and in some cases grown since independence. Consequently, West Africa is characterized by many small economies (the two exceptions being Nigeria and Côte d'Ivoire), often trying to pursue divergent policies from their neighbors, although the underlying economic conditions would argue for greater policy coordination.

Differences in exchange-rate policies between the former French colonies and the other countries of the region have been especially important for food self-sufficiency. The French-speaking nations (except Guinea and Mauritania) share a common currency (the CFA franc) that is freely convertible to the French franc (FF) at a fixed rate of 50 CFAF = 1 FF. The convertibility of the CFAF, coupled with France's willingness (within limits) to support balance-of-payments deficits of its former colonies, have enhanced the ability of most of the franc-zone countries to import food.

Most of the other countries in the region have, until very recently, had highly overvalued, nonconvertible currencies. Although this overvaluation made food imports into these countries artificially inexpensive, it also imposed foreign-exchange shortages that limited the capacity to import. The situation has changed in recent years as several countries, such as Ghana and Nigeria, have shifted to floating exchange rates and as the CFA franc has itself become increasingly overvalued relative to other major currencies.

Despite the heterogeneity of the region, certain commonalities exist across countries, as the following two case studies illustrate. From these commonalities several lessons emerge about the forces affecting food self-sufficiency in developing countries and policies that influence it; these lessons are discussed in the final section of the chapter.

NIGERIA

The onset of oil production in Nigeria in 1958 was a mixed blessing, stimulating industrialization while also foreshadowing the downturn of the country's agricultural production. At the time of independence in 1960, agriculture was the driving force in the Nigerian economy, accounting for 63 percent of gross domestic product (GDP), 97 percent of total exports, and 71 percent of employment (Oyejide 1986; World Bank 1981b). Nigeria was one of the world's leading exporters of groundnuts, cocoa, cotton, rubber, and oil palm products. By 1981 the structure of the Nigerian economy had shifted so dramatically that oil accounted for more than 95 percent of export earnings, and by 1985 agriculture accounted for less than 3 percent of total exports. Nigeria had become a net importer of several commodities, such as cotton

and palm oil, which once had been part of its economic foundation (Table 5.2). The decline in exports reflected rapidly increasing domestic demand as well as slow growth in domestic production and an increasingly overvalued exchange rate.³ In 1976 imports of rice and wheat, for which demand was booming, began to surge. As the population became more urbanized and the opportunity cost of time spent in home preparation of food increased, the value of convenience foods such as wheat and rice increased. Nigeria's ability to produce enough food to feed itself was seriously eroded by 1980. Imports of agricultural products rose by 2800 percent between 1969 and 1981, while food production grew only 1.7 percent a year between 1965 and 1980 (World Bank 1987).

Nigeria's transformation into a major agricultural importer occurred despite numerous declarations by various Nigerian administrations over the past twenty-five years that Nigeria would become food self-sufficient and regain its position as a major exporter of cocoa, groundnuts, cotton, oil palm products, and other agricultural products. But for most of this period, as outlined below, Nigeria lacked a consistent, long-term agricultural development strategy. The approach to agricultural policy in Nigeria has often consisted of crash production programs and ad hoc measures aimed at offsetting the impact of broader macroeconomic conditions driven largely by the oil sector of the economy. Agricultural policy was thus an adjunct to industrial policy. The aim was to extract capital, foreign exchange, labor, and cheap food from the agricultural sector for use in other sectors, rather than to exploit intersectoral linkages so that agricultural and industrial growth would be mutually reinforcing.

One consequence was that, until recently, the agricultural sector often bore the brunt of macroeconomic policies designed to ease the foreign exchange pressures imposed by the erratic performance of the world oil market during the 1970s and 1980s. These policies often resulted in the protection of domestic agricultural production through the use of import restrictions, such as import bans, prohibitive import tariffs, and import licensing. These measures had the effect of raising the costs of importing food while conserving much-coveted foreign exchange. In fact, estimates of effective rates of protection indicate that import-competing crops have been protected since the mid-1960s (Oyejide 1986). Even so, such protection did not result in a high supply response for several reasons. Export crops did not receive protection until the 1980s and were, in fact, implicitly taxed, albeit at a decreasing rate throughout the 1970s. Furthermore, the rates of protection for agriculture were generally lower than those for the manufacturing sector, inducing a net flow of resources out of agriculture. Finally, the sporadic nature of the quantitative restrictions resulted in the level of protection to domestic agriculture being unstable and unpredictable (Oyejide 1986).

Feeding the population of Nigeria is a formidable task. Accurate population figures for Nigeria are difficult to come by, but estimates place

Table 5.2 Indicators of Nigeria's Foreign Agricultural Trade, 1963-1988 (thousand metric tons)

	Net Exports				Net Imports		
	Groundnuts ^a	Cocoa ^b	Palm Oil	Cotton ^c	Wheat ^d	Rice	Maize
1963	624	177	41	128	53	1	0
1964	553	200	43	136	39	1	0
1965	520	306	25	152	56	1	0
1966	582	193	23	145	192	1	0
1967	549	248	34	17	124	1	0
1968	648	209	14	3	106	0	0
1969	525	174	14	8	192	1	0
1970	291	196	28	8	267	2	9
1971	137	272	23	20	405	0	4
1972	106	228	1	2	317	6	2
1973	199	214	8	0	455	1	2
1974	30	197	-17	0	325	5	2
1975	0	195	-16	31	408	7	2
1976	2	223	5	-2	735	65	10
1977	1	165	9	0	770	427	37
1978	0	193	8	-2	1363	564	47
1979	2	208	22	-13	1339	788	111
1980	0	111	-1	-54	1176	400	168
1981	0	130	-11	-105	1517	600	293
1982	3	137	-23	-151	1269	539	347
1983	0	100	-26	-58	870	544	50
1984	0	131	-26	-21	1071	213	40
1985	0	93	-26	-28	1442	356	77
1986	0	148	-10	-178	996	320	50
1987	0	101	-15	-28	141	400	0
1988	0	155	-10	-11	25	200	0

Source: FAO, *FAO Trade Yearbook*, various issues.

^aGroundnuts, total green, shelled basis

^bCocoa beans, raw or roasted

^cCotton lint

^dIncludes wheat and wheat flour in wheat equivalent

the population at 95-110 million in 1988. (Nigerian population and agricultural production statistics are notoriously suspect.) Even more troubling than the absolute size of the population, however, is the increasing speed at which the population is growing. Between 1965 and 1980 the population grew at a rate of 2.5 percent per year, but between 1980 and 1985 the figure jumped to 3.5 percent, one of the highest rates in Africa, reflecting the substantial immigration of foreign workers attracted by the oil boom. The implications of this growth rate on Nigeria's ability to feed itself are enormous, considering the slow growth of agricultural production since the 1960s.

The Evolution of Self-Sufficiency Policies, 1960-1972

Food self-sufficiency is a goal that has evolved slowly in Nigeria. In the early 1960s, a major goal of agricultural policy was the revitalization of the agricultural export sector in order to provide foreign exchange. The scant concern about food-crop agriculture during the early years of independence reflected the success that Nigeria had experienced up to that time in increasing food production simply by expanding the cultivated area. As both land and labor constraints increasingly limited Nigeria's ability to follow this strategy during the 1960s and 1970s, government policy shifted toward more explicit attention to food self-sufficiency.

In the First National Development Plan of 1962-1968, objectives for agriculture were not clearly specified, despite the general aim to "achieve a modernized economy consistent with the democratic, political, and social aspirations of the people [by an] increase in the production of export crops" (Idachaba 1980, page 40). A mere 1.6 percent of the total federal public sector budget was allocated to crop research, even though crop production amounted to nearly 50 percent of GDP in the four years preceding the plan. In part because of this lack of attention, by the end of the plan period in 1968, total food production was only 83 percent of what it had been in 1964 (Idachaba 1980).

The marketing of export crops was handled by official monopoly marketing boards, which were established in the late 1940s to stabilize prices and incomes of export crop producers and to support crop research and development. The boards employed licensed agents, who were authorized to purchase at officially decreed, fixed prices (guaranteed minimum prices, or GMPs). The boards handled the movement of export crops through world commodity markets. For most commodities, the GMPs were below domestic market prices and thus served as a means of taxing agriculture, with the proceeds often flowing to other sectors.

During the First National Development Plan, Nigeria was generally running balance-of-payments deficits. Import restrictions including import duties of 40-70 percent on agricultural commodities were imposed to help alleviate balance-of-payments pressures. The deficits became especially acute during the civil war, which began in 1967, leading to a more concerted emphasis on export crops during the Second National Development Plan of 1970-1974, with the aim of generating foreign exchange (Idachaba 1980). The concentration on export crops was reflected in the allocation of agricultural research funds. Export crops received 63 percent of total agricultural research monies, whereas only 33 percent went to food crops (Idachaba 1980). The poor quality of government spending on agriculture has continually plagued the agricultural sector and has been partially responsible for the sector's weak performance (Lele and Bindlish 1988). Import licensing and even higher customs duties further restricted imports. These actions were driven more by a need to deal with the foreign exchange constraint than with

a strategy of agricultural development based on protection. During this period, as throughout most of the postindependence period, food self-sufficiency was perceived primarily as a tool to deal with the foreign exchange crisis rather than as an end in itself. The federal agricultural programs were aimed primarily at promoting large-scale, mechanized farming in hopes of increasing output and consequently freeing much-needed labor for the growing industrial sector. But these programs were often mismanaged and inappropriate for the small-scale nature of Nigerian agriculture, which did not have the institutional capacity to effectively repair, maintain, and manage mechanized farm equipment.

The Oil Boom and Bust, 1972-1986

The fivefold increase in oil revenue between 1972 and 1974 set the stage for the Third National Development Plan of 1975-1980, which eased many of the restrictions on imports imposed during the previous plan. By 1977, import duties were 10-20 percent, as low as they had been in 1960. Thus the protection that had been accorded agriculture through the previous restrictions was now gone. The oil boom raised the overall income level of the country, which led to increased demand for almost all goods and services, both tradable and nontradable. Higher foreign exchange earnings supported increased imports to satisfy the higher demand for tradable goods. This is highlighted in Table 5.2 by the dramatic increase in imports of rice, wheat, and maize beginning in the mid-1970s. However the increased demand for domestically produced nontradable goods was met by a finite supply. This induced a price rise in nontradable goods relative to tradables, generating an implicit appreciation of the real exchange rate. The overvaluation of the naira, which continued until devaluation in 1986, made it increasingly difficult for the agricultural export sector to compete on world markets, augmenting the shift of labor out of agriculture induced by the oil boom (Collier 1988).

The growing services sector in the cities that arose to support the new oil industry, the urban bias in the provision of infrastructure, and high urban wages induced high rates of rural-to-urban migration. The proportion of the population living in cities grew from 13 percent in 1960 to 30 percent by 1980. Consequently, in spite of rapid overall population growth in the country, agriculture faced labor shortages and hence higher costs of production. This was especially devastating at a time when the food needs of the population were growing rapidly and surpluses from the agricultural sector were expected to finance the growth of industry. Falling per capita food production combined with burgeoning consumption caused the demand for imports to skyrocket. Between 1970 and 1980 the food import bill rose more than tenfold. Agricultural exports plummeted as well, making the agricultural sector a net consumer of foreign exchange.

Increases in food imports represented a threat to Nigeria's foreign exchange reserves and raised concerns about the ability of the country to

sustain such expenditures should oil revenues drop. In response the government launched Operation Feed the Nation (OFN) in 1976, intended to increase food production and help Nigeria attain self-sufficiency in food through the distribution and subsidization of inputs such as seeds and fertilizers. The government also announced countrywide, guaranteed minimum producer prices. But the inefficiencies that dominated OFN hindered Nigeria's ability to feed itself. Prices paid to producers were often well below market prices and remained unadjusted for long periods. As a result, real producer prices continued to decline, falling 24 percent for food crops and 33 percent for export crops between 1970 and 1983 (Oyejide 1986).

In 1977, the world price of oil began to plummet. Once again the government imposed import restrictions in the hope of conserving foreign exchange. Import prohibitions were placed on fresh milk, frozen and chilled meat, eggs, beet sugar, live poultry, bakery products, vegetables, and fruit. Licensing also covered cane sugar, wheat, rice, cereal flour, beef, and other grains. The early 1980s were especially severe for Nigeria, as revenue from oil production dropped dramatically, falling 52 percent between 1980 and 1983. After an average annual growth rate of GDP of 8 percent between 1965 and 1980, GDP fell at an average annual rate of 3.2 percent between 1980 and 1986. The Fourth National Development Plan of 1980-1985 aimed at self-sufficiency in food production by 1985 and sought to regain the country's previous position as a major exporter of groundnuts, cocoa, cotton, rubber, and oil palm products. In pursuit of these goals, the government launched the Green Revolution Programme in 1980. Again the emphasis was placed on large-scale, capital-intensive production schemes despite the fact that 90 percent of agricultural production still came from smallholders. As the foreign exchange crisis widened between 1982 and 1983, more than 200 commodities were added to the list of those requiring import licenses (Oyejide 1986), and the exportation of many food crops was banned. In 1986 the list of bans on imports included wheat, rice, maize, vegetable oils, and a wide array of other foods.

Although it is virtually impossible to assess the magnitude of smuggled goods into Nigeria, the increased use of import bans greatly increased the incentive for smuggling, given the low prices of several food crops on the international market. The international price of imported rice, for example, remained low enough that smuggling rice from neighboring countries was profitable in spite of the high costs involved in smuggling. Neighboring countries such as Benin, Chad, Cameroon, and Niger have served as sources of contraband commodities. Imports of rice and maize were banned in 1986, probably explaining the increase in rice imports into Niger from 9,880 metric tons in 1984 to 28,230 metric tons in 1986. A similar jump was experienced in Chad, with rice imports rising from 6,250 metric tons in 1984 to 27,380 in 1985 and 17,200 in 1986. Maize imports into Cameroon

jumped from 800 metric tons in 1984 to 4,300 in 1986 (FAO, various years). The most striking case of re-exportation, however, was in Benin, where rice imports jumped from 36,600 metric tons in 1983 to more than 352,000 metric tons in 1987, of which more than 90 percent was re-exported to Nigeria (Vallée 1989). Indeed, Benin became Nigeria's largest supplier of cereals and luxury goods from the international market. During the late 1980s, government receipts from port charges and import duties for goods destined for re-exportation to Nigeria provided roughly 50 percent of government revenues in Benin.⁴

Over the years, Nigerian governments have tried to limit smuggling through border closures and other operations. In 1985, the Buhari government created a "border zone" stretching twenty kilometers back from the border. This zone received no supplies of any products likely to interest neighboring countries, such as fuel, spare parts for vehicles, and cement. Buhari's successor, President Babangida, abolished the border zone and began bilateral negotiations with neighboring countries to control cross-border trade. Yet when rice imports continued to soar, he closed the border in late 1988 and dispatched the army to try to control smuggling (Igué 1989; Vallée 1989). The border closure was short-lived, however, and bilateral negotiations were reopened. Thus, although the bans were intended to increase the protection accorded Nigerian producers, and thereby contribute to Nigeria's increased ability to produce its own food, they have not been very effective because of heavy leakages, especially in rice. The bans appear to have been more effective in limiting wheat imports. In 1986, total official and unofficial imports of wheat and wheat flour into Nigeria totaled 1.2 million metric tons (grain equivalent). By 1987, the total had fallen to only 100,000 metric tons (Coste 1989). The bans also forced Nigeria to forgo the foreign exchange that had been earned through import tariffs and the issuance of licenses, although the allocation of these had been fraught with corruption.

Structural Adjustment Since 1986

By 1986, the worsening economic crisis had led Nigerian government leaders to rethink the role of agriculture in the country's economic development strategy. Increasingly they viewed agricultural policy, including trade, in terms of its impact on agricultural growth and intersectoral linkages, not merely as a means of easing foreign exchange constraints or financing growth in other sectors. The Structural Adjustment Programme (SAP) initiated in 1986 clearly reflected this changing perception of agriculture. The long-overvalued naira was devalued by nearly 70 percent, making the importation of capital (and imports in general) more expensive and Nigerian exports more attractive on the world market. In addition to attempting to expand nonoil exports, the SAP sought to reduce the import content of locally manufactured goods, achieve self-sufficiency in food, and give a larger role to the private sector. It abolished import licenses (replaced with import bans), placed the

allocation of scarce foreign exchange in the hands of an auction market, abolished export duties, and privatized numerous parastatals.

The SAP also abolished commodity marketing boards, which had been burdening the budget since the early 1980s. In the early 1960s, prices paid by the boards to producers were so low that they amounted to an implicit tax on exports. But due to the declining value of export crops resulting from an overvalued exchange rate, the tax had become a subsidy that the government was unable to sustain. The marketing boards had accumulated large debts by 1986. The boards were also fraught with inefficiencies and mismanagement, lack of funding, inadequate stocks of materials, and a lack of basic data for planning. The boards were consequently abolished by the Babangida regime in 1986, and a free market in all agricultural commodities was established. The abolition of the commodity boards, coupled with the devaluation of the naira, had the effect of substantially increasing prices paid for export crops. For example, the price paid for cocoa during 1986/87 was as high as 3500–5000 naira per metric ton, compared to the official producer price of 1600 naira per metric ton in 1985/86. Nonoil exports, particularly cocoa and other agricultural products, have performed well, rising 40 percent a year in 1987 and 1988 (World Bank 1989a).

Incentives in the food crop sector have also improved as the devaluation of the naira increased the cost of imported foods. Thus, one significant effect of the SAP has been to shift the domestic terms of trade back toward Nigerian agricultural production. Lele and Bindlish (1988) argued that the outmigration of labor from the rural areas was reversed with the onset of the oil slump in the early 1980s. However, recent FAO figures show that between 1980 and 1985, the percentage of the economically active population in agriculture actually declined from 68.1 to 66.5 percent; by 1988 the figure had dropped to 65.5 percent, suggesting that at best the outmigration from the rural areas may have been slowed but not reversed.

As might be expected, the SAP also had substantial impact on the neighboring countries that had built much of their development strategies during the 1980s on their clandestine trade with Nigeria. By the late 1980s, the effects of Nigeria's trade bans and devaluation had so reduced the re-exportation of goods from Benin, Niger, and Chad to Nigeria that these countries were all forced to undertake structural adjustment programs themselves.

Clearly, Nigeria has had a difficult time orchestrating the simultaneous growth of the industrial and agricultural sectors. With the slump in the oil industry beginning in the early 1980s, the dangers of relying on one "get-rich-quick" resource have been felt. Since then the agricultural sector has received considerable attention. The devaluation of the exchange rate, the elimination of the commodity boards, and the institution of import bans have all helped to reignite growth in the agricultural sector. In 1986 maize production grew by 12.3 percent, sorghum by 9.3 percent, millet by 11.6

percent, and rice by 13.8 percent, perhaps heralding a resurgence of the agricultural sector.

The limited success Nigeria has had in achieving self-sufficiency in food over the thirty years since independence has been due to large shifts in factors affecting both supply and demand. Despite periods of high rates of protection and favorable terms of trade to the food-crop sector, and several statements of commitment by successive regimes to attaining food self-sufficiency, the agricultural sector has been unable to produce adequate food to feed the Nigerian population. The frequent changes in governments since independence have promoted a short-sighted approach to agricultural policy. Highly visible projects, such as large irrigation schemes and the promotion of mechanization, were seen as indications that the government was "doing something" about agriculture. However, the lack of a long-term, comprehensive plan of improving the production capacity of the small-scale farmer has been a major downfall of agricultural policy in promoting the growth of supply. More fundamentally, the reliance on the agricultural sector as a shock absorber for the economy in times of fiscal crises has forced the agricultural sector to bear most of the burden of adjustment of the economy to changes in relative prices and to changes in the exchange rate, trade, and other macroeconomic policies. At the same time, the rapid income growth and urbanization stimulated by the oil boom induced a growth in demand, particularly for rice and wheat, far in excess of Nigeria's domestic production capacity, and, consequently, imports soared. Nigerian leaders hoped that the structural adjustment program, the first phase of which ended in 1988, would lead to a more balanced growth between the industrial and agricultural sectors. Their aim was to begin to assure Nigeria's long-term ability to feed itself through a combination of domestic production and imports paid for by production from other sectors of the economy.

THE SAHEL

The Sahel encompasses the nine West African countries located just south of the Sahara (Cape Verde, Senegal, The Gambia, Mauritania, Mali, Burkina Faso, Niger, Chad, and Guinea-Bissau). These are among the poorest countries in the world. In contrast with Nigeria, where food self-sufficiency policies were largely driven by developments in the oil economy, in the Sahel such policies arose mainly in reaction to massive droughts that struck the subregion during the early 1970s. Although the drought was the proximate cause of these food self-sufficiency measures, the trend toward decreasing food self-sufficiency in the Sahel was already well established before the 1970s. Table 5.3 summarizes cereals production and output of six Sahelian countries during two periods: 1974/75–1984/85 and 1985/86–1988/89. The earlier period includes eleven years in which rainfall was generally below historical levels and in which most Sahelian countries

Table 5.3 Trends in Cereals Self-Sufficiency in Major Sahelian Countries, 1974/75-1988/89 (thousand metric tons)

Country	Production	Food Aid	Commercial Imports	Import Dependency ^a (percent)
Burkina Faso				
1974/75-1984/85	1,155	54	82	10.5
1985/86-1988/89	1,781	50	110	8.5
The Gambia				
1974/75-1984/85	69	15	48	47.8
1985/86-1988/89	101	15	88	50.2
Mali				
1974/75-1984/85	991	75	69	12.4
1985/86-1988/89	1,816	59	104	8.4
Mauritania				
1974/75-1984/85	43	76	72	73.4
1985/86-1988/89	139	72	173	63.8
Niger				
1974/75-1984/85	1,704	54	53	6.4
1985/86-1988/89	1,870	43	74	6.3
Senegal				
1974/75-1984/85	734	78	420	40.4
1985/86-1988/89	1,013	93	382	30.2
Total				
1974/75-1984/85	4,697	352	744	18.7
1985/86-1988/89	6,719	332	931	15.9

Sources: For 1974/75-1983/84, all figures are taken from Berg (1987, p. 332). Production figures for 1984/85-1988/89 are from the following sources: 1984/85-1985/86: CILSS/FAO data published in *CILSS/Club du Sahel Newsletter*, no. 1, December 1987, p. 3; 1986/87-1987/88: CILSS/FAO data published in *CILSS/Club du Sahel Newsletter*, no. 4, February 1989; 1988/89: CILSS/Club du Sahel, unpublished data. Trade figures for 1985-1988 from FAO (1988).

Note: All figures are annual averages for the period.

^aImports as a percentage of total grain availability

followed restrictive policies concerning private grain trade. Beginning in 1985, rainfall returned to more normal levels, and many countries began to liberalize their grain markets, at least domestically. Total cereal production stagnated during the earlier period, although there were significant year-to-year variations. In contrast, cereal production in these six countries has grown sharply since 1984, averaging 63 percent higher during 1985/86-1988/89 than in the previous eleven-year period.

Because production stagnated during the earlier period while demand continued to grow, imports soared. The share of imports in total cereal consumption increased from 15 percent in 1974/75 to 26 percent in 1984/85.

In the subsequent four years, the growth of domestic production has cut the share of imports in total consumption to around 16 percent. However, the absolute levels of imports have remained fairly steady, reflecting a structural deficit in rice and wheat production that is not offset by increases in millet and sorghum production due to the reluctance of Sahelians to substitute millet and sorghum for rice and wheat in their diets. A large proportion of the imports to these poor countries arrived in the form of food aid. In 1984/85 per capita food aid for the region totaled 32 kg, nearly 20 percent of total grain consumption (Staatz 1988).

Table 5.3 reveals that the degree of reliance on grain imports varies greatly between the coastal states and the landlocked countries. In the latter, greater transport costs offer some natural protection to domestic agriculture, and lower per capita incomes limit demand. Between 1974/75 and 1984/85, imports (largely wheat and rice) accounted for 40 percent of grain consumption in Senegal, 48 percent in the Gambia, and 73 percent in Mauritania. In contrast, the proportion was only 12 percent in Mali and 6 percent in Niger.

Grain production in the Sahelian countries is highly volatile. For example, between 1980 and 1987 total millet, sorghum, and maize production in Mali varied nearly 100 percent, from 779,000 to 1,501,000 metric tons. Rice production (milled equivalent) showed even greater volatility, ranging from 109,000 to 236,000 metric tons (Office Statistique des Communautés Européennes 1988).⁵ This volatility, combined with the thinness of markets, results in widely fluctuating prices. Between March 1987 and July 1988, for example, the producer price of millet in southern Mali quadrupled (Staatz et al. 1989). The volatility in production and prices has had two contradictory effects. On the one hand, it has made the issues of domestic food supply and food prices central political concerns in most Sahelian countries. Securing a reliable food supply has become a top priority, and official pronouncements of the Sahelian states have often framed this in terms of assuring food self-sufficiency. For example, Senegal's New Agricultural Policy, adopted in 1984, called for the country to move from roughly 50 percent self-sufficiency in basic grains in 1984 to 80 percent by the year 2000. The Malian food strategy calls for 100 percent grain self-sufficiency. On the other hand, the volatility of domestic production increases the potential gains from trade, as the variance in world and regional production is less than that of individual Sahelian countries. Yet until the late 1980s, few Sahelian countries included international trade as an integral part of their food security strategies. Indeed, most took an antagonistic view toward trade, viewing self-sufficiency as necessary in order to control domestic food supply.

Factors Affecting Grain Self-Sufficiency In the Sahel

Drought is frequently cited as the main explanation for the Sahel's decreasing grain self-sufficiency over the past thirty years. Yet a number of forces, many

of them policy related, have affected both the domestic supply of and demand for cereals in the Sahel.

Slow growth in domestic supply. The slow growth in domestic grain supply through the mid-1980s in the Sahel reflects the combined effects of a weak and declining natural resource base, poor weather, substantial underinvestment in food crop research, and inappropriate government policies. The resource base in many of the Sahelian countries is fragile, particularly in the northern regions where population pressure has led to the encroachment of cultivation into areas traditionally reserved for grazing. The resultant loss of vegetative cover has led to environmental degradation and fears that the Sahara is spreading southward into the region. Poor weather in the 1970s and 1980s compounded the production problems arising from this weak resource base. Throughout most of the Sahelian countries, rainfall is the main constraint on production, as reflected in the rapid increase in production when rainfall returned to more normal levels in 1985. Historically, the Sahel has experienced recurring long cycles of below- and above-average rainfall, with the entire cycle often lasting thirty to forty years. The late 1960s through the mid 1980s were marked by lower than average rainfall for most parts of the Sahel and the Fouta-Djalon area of Guinea, which includes the headwaters of several major rivers of the subregion. This period was punctuated by severe droughts in 1972/73 and 1983/84. The poor weather had major impacts on staple food production in the subregion, which is almost entirely rainfed or produced under irrigation that is highly dependent on river levels. Although rainfall has returned close to or above historical norms, the trauma of disruption and death caused by the drought of the early 1970s strongly influenced the drive toward food self-sufficiency in much of the Sahel during the 1970s and 1980s.

Domestic production was further limited because of the general underinvestment in food-crop agriculture in most of the Sahelian states since independence. For example, in Mali the share of the agricultural sector in total development funding fluctuated around 20 percent between 1960 and the late 1980s, showing a declining trend after 1978 (Dioné 1989). Of these funds, only 6 percent were devoted to research in 1970-1973, falling to 2.2 percent for the 1986-1991 National Development Plan (Dioné 1989). Over the period 1965-1987, agriculture in Mali (including livestock) accounted for 54 to 65 percent of GDP, 71 to 96 percent of merchandise exports, and 80 to 90 percent of all employment (World Bank 1987, 1989b). The underinvestment of financial resources was matched by lack of investment in human capital. Between 1952 and 1963, in all of Francophone Africa, including the Sahel, only four university graduates were trained in agriculture (Eicher 1984). Investment that did take place in domestic agriculture concentrated heavily on export crops, particularly cotton and peanuts, and on large rice irrigation schemes. Ironically, the investments in cash-crop production may have done more to increase food self-sufficiency than the rice

projects. For example, throughout the Sahel there has been major investment in the cotton subsector, with spectacular results. Over the period 1961/62-1985/86, cotton production grew nearly eightfold. Most of the increase was due to higher yields, which grew sixfold over this period, reflecting the introduction of new varieties, animal traction, chemical fertilizers, and pesticides (OECD 1988).

The green revolution in cotton production and, to a lesser effect, the expansion of peanut cultivation have helped stimulate food crop production. Goetz (1990) and Dioné (1989) describe how cultivation of these cash crops has augmented food crop production by helping to finance the acquisition of agricultural inputs (particularly animal traction equipment and fertilizer) and the development of market infrastructure. Revenues from cotton and peanuts also provide liquidity to farm households in the immediate post-harvest period, thereby allowing them to defer grain sales to later, more profitable periods of the year. Incentives are thereby created for family labor to remain on the farm, cultivating cereals as well as cash crops. In southern Mali in 1985-1987, 75 percent of the marketed surplus of millet, sorghum, and maize was produced by fewer than 20 percent of total farm households. Most of these surplus producers were also heavily involved in cotton production (Dioné 1989). In contrast, although the irrigation schemes did increase domestic rice production, they did so at high cost. The World Bank (1981a) estimated that for coastal countries such as Senegal, the cost of production of rice from these schemes was, at a minimum, 50 to 120 percent higher than the cost of imported rice. Furthermore, although there has been expansion of new irrigation, poor maintenance has led to substantial amounts of irrigated land going out of production, resulting in little net increase in irrigated area (World Bank 1981a).

Although it is often alleged that government price policies have uniformly discriminated against food crop production in the Sahel, the record is mixed on this point. An analysis of net protection coefficients shows that in general the Sahelian countries taxed export crops more heavily than food crops over the period 1977-1984.⁶ In Senegal, for example, farmers received only about 75 percent of the world price for peanuts, but 94 percent of the world price for cereals. There was considerable variation across countries, however, with Mali heavily taxing both export and grain crops, and other countries outside of the franc-zone, such as Mauritania and the Gambia, paying above-market prices for cereals. Despite being heavily taxed relative to cereals, cotton production expanded rapidly during this period, reflecting the large increases in productivity brought about by technical change in the cotton subsector. In contrast, the lack of technical progress in the cereals subsector contributed to the slow growth in cereals production even in those countries where prices were high relative to world market levels.

During the period 1985-1987, when domestic prices for both exports and cereals rose markedly relative to world prices, the pricing situation changed

dramatically, particularly in the franc-zone countries. It appears that the franc-zone countries were trying to use trade policies (import tariffs and export subsidies) to counteract the effect of an increasingly overvalued currency (Shapiro and Berg 1988). One effect of this increased protection was to stimulate re-exportation of grain, particularly rice, from non-franc-zone countries into neighboring franc-zone countries, especially to Senegal and Mali.⁷ The Gambia, for example, imported roughly 65,000 metric tons of rice in 1987 that it subsequently re-exported clandestinely to Senegal, and approximately 35,000 additional metric tons were re-exported to Senegal from Guinea-Bissau and Mauritania. Similarly, between 60,000 and 95,000 metric tons of re-exported rice flowed into Mali in that year (Coste 1989). The Gambia, in particular, based much of its commercial and agricultural development strategy during the late 1980s on its ability to live off of the protection Senegal offered its rice sector.⁸ The net effect of these re-exports was a weakening of the ability of the Senegalese and Malian governments to use trade protection to boost domestic grain self-sufficiency.

Domestic grain marketing policies also probably constrained the growth of domestic supplies. Following independence, almost all the Sahelian states opted for a strong state role in the grain marketing system through the creation of state grain boards, which were often granted official monopolies in grain marketing. In addition, governments at times set low and inflexible official producer and consumer prices, most frequently with no provision for geographical or seasonal variations. Because the official marketing agencies never proved capable of handling a majority of the marketed surplus, a parallel market, illegal but frequently tolerated, continued to operate in these countries.

The imposition of rigid regulations governing grain marketing had two effects on grain self-sufficiency. First, it raised transaction costs in marketing by forcing private traders to operate clandestinely, increasing their risk of grain confiscation, and inducing them to avoid highly visible investments in transport and storage that could have led to economies of scale (Staatz et al. 1989). These increased transaction costs undoubtedly reduced producer prices and probably discouraged production for the market.⁹ Second, by restricting intra- and intercountry movements of grain, the marketing regulations reduced the volume of market trade, thereby making markets more volatile and risky. This, in turn, increased the incentives for individual households, regions, and countries to strive for food self-sufficiency, as they could not reliably count on the market to supply food to them when their own supplies ran short. Ironically, in a part of the world where the vagaries of weather make local grain supplies very unreliable, government policy, by fragmenting markets, forced households and regions to rely primarily on these local supplies rather than using trade to help smooth out supply fluctuations. A vicious cycle developed wherein government officials, viewing the erratic performance of these fragmented markets, often concluded that the private trade was incapable

of serving the public and that further restrictions on the private sector were necessary.

The massive amounts of financial and food aid pouring into the Sahel may have also reduced pressures on Sahelian governments for domestic policy reform. In 1987, foreign aid per capita in the Sahel stood at US\$59, compared with US\$26 for sub-Saharan Africa as a whole and US\$9 for Asia (CILSS/Club du Sahel 1990). The Sahel figure was the equivalent of 20 percent of GNP per capita for the region.¹⁰ The willingness of the donors to finance the accumulating deficits of marketing parastatals and general government budgets, and to ship large amounts of food aid, probably reduced the incentives of Sahelian governments to address structural imbalances in their economies. The situation began to change in the early 1980s when, with the emphasis on structural adjustment, donors began to demand fundamental policy reforms in exchange for continued aid. Some of these changes are discussed below.

Growth in domestic demand Self-sufficiency in cereals also fell because of burgeoning demand, particularly for rice and wheat. Population grew at 2.8 percent per annum from 1960 through 1985, doubling over this period and outstripping domestic food production. As a result, per capita grain production in 1982-1984 had fallen 6 percent relative to 1974-1976 (OECD 1988, Staatz 1988). Per capita income growth was near zero during the period 1965-1985, and hence was not a major cause of demand growth (Staatz 1988). In contrast, urbanization has played a major role in changing the composition of demand for foodgrains in the Sahel. Although the Sahelian population continues to be predominantly rural (Senegal, the most urbanized country of the subregion, has 40 percent of its population in cities), urban populations grew between 1960 and 1985 at an annual rate of 7 percent (OECD 1988). The opportunity cost of women's time in urban areas (where households may be cut off from their extended families) is often higher than in rural areas, as is the cost of fuelwood. Both of these factors have favored the consumption of rice and wheat, which are easier to prepare and consume less fuel in preparation. When preparation costs are included, traditional coarse grains such as millet, sorghum, and maize are not nearly as competitive with rice as would be suggested by the relative prices of these cereals in the market (Reardon 1989). Furthermore, urban congestion has made it more difficult for urban workers to return home for lunch; therefore, a "fast-food" industry has developed in most major cities, consisting of vendors who prepare sandwiches or lunches based on rice. Reardon et al. (1989) have shown that far from being a luxury food, rice is heavily consumed by the poor in Ouagadougou (the capital of Burkina Faso), much of it in prepared form at lunch stands. Delgado (1989), in a study of grain consumption patterns between 1970 and 1983 in Senegal, Côte d'Ivoire, Burkina Faso, and Niger, found that urbanization, rather than changes in relative prices, was the main factor shifting demand from millet, sorghum, and maize toward rice and

wheat.¹¹ In order to increase their overall degree of grain self-sufficiency, CILSS (the regional organization of Sahelian states) has launched a major research effort to develop improved processing methods for millet, sorghum, and maize. The aim of this project is to make these grains more attractive to consumers by increasing their convenience and reducing their cost "delivered to the consumer's table."

Recent Developments

Several factors thus combined to erode the competitiveness of Sahelian grain production during the 1970s and 1980s. These factors included low productivity relative to that of major grain-exporting countries, overvalued exchange rates, and export subsidies paid by major exporters such as the United States and Thailand. At the same time, demand was rapidly shifting away from millet, sorghum, and maize, which the Sahel has traditionally produced, toward rice and wheat, because of the convenience of these foods. The result was burgeoning imports, which are not financially sustainable given the weak export earnings of the region.

Concerns about the Sahel's competitiveness came to a head in 1986, when record harvests, combined with low world prices for imported rice, led to grain market gluts throughout the Sahel. After years of struggling to deal with food shortages, the Sahelian countries found themselves awash with surpluses of millet, sorghum, and maize, brought on, it seemed to policymakers, by artificially cheap rice imports that had captured much of the domestic market. In an attempt to deal with the problem, participants in a CILSS/Club du Sahel regional grain policy conference held in Mindelo (Cape Verde) in December 1986, proposed the creation of a regional protected market for cereals in West Africa. The proposal called for the creation of a free-trade zone for cereals within West Africa, but the imposition of uniform variable levies on grain imports into the region. This system of protection, it was argued, would create the incentives needed to boost domestic production, stimulate investment in the agricultural sector, shift consumption away from rice and wheat toward millet, sorghum, and maize, and thus reduce dependence on imports (Gabas et al. 1987).

The Mindelo proposals stimulated a huge debate among donors and Sahelian policymakers about the feasibility and desirability of such a scheme.¹² Numerous questions were raised about whether the coastal states would be willing to participate in such a plan, as they would be forced to forgo cheap imports in order to help support grain producers of the inland Sahel countries. In addition, it was not immediately apparent how a variable levy would be imposed across countries with widely varying and fluctuating exchange rates. Others questioned whether the program would be desirable, even if it could be implemented. In essence, those who argued for higher prices were advocating a price-led strategy of agricultural development. Such a strategy, as opposed to one based on reducing unit costs of production (and

hence the real cost of food to consumers), raises serious questions for many countries in the Sahel, where a large number of rural residents are net purchasers of food who would be hurt in the short run by higher food prices. Higher food costs would also probably result in pressures to raise wages (and hence increase labor costs), thereby reducing the competitiveness of the noncereals sectors of the economy. It would also increase production costs to those industries, such as poultry production, that use cereals as a major input (Dembélé and Staatz 1989).

In recognition of some of these shortcomings, calls for regional protection became more muted in the late 1980s. A CILSS/Club du Sahel conference in Lomé (Togo) in late 1989 called for more attention to be focused on food security on a West African regional basis rather than national food self-sufficiency. The importance of regional trade in foodgrains within West Africa, which had been documented by researchers during the late 1980s, was explicitly recognized as a contributor rather than a hindrance to food security (CILSS/Club du Sahel 1990).

Hence, by the beginning of 1990, policymakers in the Sahel were beginning to broaden their view of food security, no longer equating food security with food self-sufficiency. Much more attention was being paid to assuring a stable supply of food from a combination of domestic production and regional and international trade, and to generating sufficient incomes to assure the poor access to that food. There was also greater recognition that food policies could not be established in isolation of broader macroeconomic policies and the trade policies of neighboring countries. The return of good rains in 1985 certainly made the transition to a more liberalized, trade-oriented grain policy politically easier for these countries. A major challenge will be for them to maintain this broader view of food security when droughts recur and renewed calls arise for export bans and restrictions on private grain trade.

CONCLUSIONS

The experience of West Africa over the past thirty years illustrates the complexity of factors influencing staple food self-sufficiency. At first glance, it seems paradoxical that West Africa's food self-sufficiency has fallen even more quickly than that of the rest of Africa, as this is the region of sub-Saharan Africa (excluding the Republic of South Africa) that has shown the strongest economic growth and has the highest per capita income of any region on the continent (Staatz 1988). But it is precisely this economic growth, particularly in Nigeria, that has fueled much of the demand for imported cereals, thereby contributing to lowered self-sufficiency. Self-sufficiency was further weakened by the lack of a long-term agricultural development strategy in most countries, which slowed the growth in domestic food supplies. Inappropriate macroeconomic policies, such as

overvalued exchange rates, also lowered incentives for domestic food production and cheapened grain imports. The experience of West Africa also illustrates the futility of countries with porous borders attempting to enforce national self-sufficiency policies independently of the policies of their neighbors. Attempts by Senegal, Mali, and Nigeria to increase domestic food self-sufficiency by imposing trade barriers to protect domestic agriculture were quickly undermined by traders in neighboring countries (often with the complicity of their governments), who responded to the profit opportunities created by these protectionist measures.

By the late 1980s, most West African governments began to face up to the failures of their previous food policies and increasingly recognized that national food self-sufficiency, although still a political slogan in some countries, was neither a realistic nor a desirable goal. Policymakers have increasingly begun to view food security (assuring the population access to an adequate supply of food, be it imported or domestic) as the more appropriate aim. Attaining such a goal will involve strengthening the already existing trade links among the West African countries themselves in order to exploit the complementarities in food production within the region. It will also require stimulating broad-based income growth through cash-crop production and non-farm activities, as well as food production in order to assure that the population has the means to obtain its basic food, whether imported or locally produced.

NOTES

1. In this chapter, West Africa is defined to include the following countries: Benin, Burkina Faso, Cape Verde, Chad, Côte-d'Ivoire, the Gambia, Ghana, Guinea Bissau, Guinea-Conakry, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

2. These figures were calculated from World Bank data (World Bank 1989a).

3. Trends in domestic production varied widely by commodity. For example, between 1970 and 1985, groundnut production fell by more than half and rice production stagnated, whereas palm oil production increased by 50 percent.

4. As stated by John Igué in an oral presentation to the CILSS/Club du Sahel Lomé Seminar on Regional Trade in West Africa, Paris, November 1989.

5. Even though rice is produced largely under irrigation, production is highly weather dependent due to the low degree of water control in most Malian irrigation schemes.

6. Net protection coefficients (NPCs) are essentially ratios of domestic farmgate prices (adjusted for internal handling and transport costs) to world prices. Hence, an NPC less than one indicates that a crop is being taxed relative to world market prices, whereas an NPC above one indicates a subsidy. The analysis discussed here is based on NPCs presented by Shapiro and Berg (1988).

7. During the late 1980s, Mali imposed an import tariff of 38 percent on rice, complemented by occasional import bans when the government's main rice-producing parastatal, the Office du Niger, had difficulty selling stocks (Ceolo

1989). Similarly, during the period 1985–1988, the Senegalese government set the official retail price of broken rice at 160 CFAF per kilogram, compared with a CIF price in Dakar of approximately 69 CFAF per kilogram (calculated from data in Ceolo 1989).

8. For details, see Ndoye et al. (1989); Coste (1989); and Vallée (1989).

9. It is impossible to quantify this effect (or to judge its impact on supplies relative to the impact of changes in rainfall) because of a lack of data on supply elasticities and on parallel market prices during this period. For a review of the debate on the level of supply elasticities for cereals in the Sahel, see Shapiro and Berg (1988); D'Agostino and Staatz (1989); and Jayne and Minot (1989).

10. This figure was calculated from data from the World Bank (1989b).

11. Delgado found no statistically significant relative price effect except for rice in Senegal. In contrast, a 1 percent increase in urbanization led to a 2 percent increase in the proportion of rice in total cereal consumption.

12. For summaries, see Jayne and Minot (1989) and D'Agostino and Staatz (1989).

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