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AGRICULTURAL POLICY IN TROPICAL AFRICA:
IS A TURNAROUND POSSIBLE?

BY
JEAN M. DUE

JANUARY 1986

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AGRICULTURAL POLICY IN TROPICAL AFRICA:
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Agricultural Policy in Tropical Africa: Is a Turnaround Possible?

Jean M. Due*

Although agricultural production in tropical Africa outpaced population growth from independence in the early 1960s to the mid-1970s, production per capita has fallen in the last decade. Africa is the only major Third World area where this has occurred (Figure 2). What have been the major causes of this failure of agricultural policies in tropical Africa? Can changes be made which will overcome the constraints? Have there been success stories and what have those countries done differently?

Background

Tropical or Sub-Saharan Africa includes some 39 countries south of the Sahara but excluding South Africa (Figure 1). These countries have many characteristics in common but at the same time have a great variety of agro-ecological zones, ethnic groups, and languages.

Table 1 shows trends in agricultural production in tropical Africa since independence. In most cases agriculture suffered from benign neglect in the early decade after independence while governments focused on industrial development, mostly for import substitution. At independence most tropical African countries inherited export crop prices, marketing arrangements, and research that allowed foreign exchange earnings to continue for the first decade, with marketing board surpluses utilized for development

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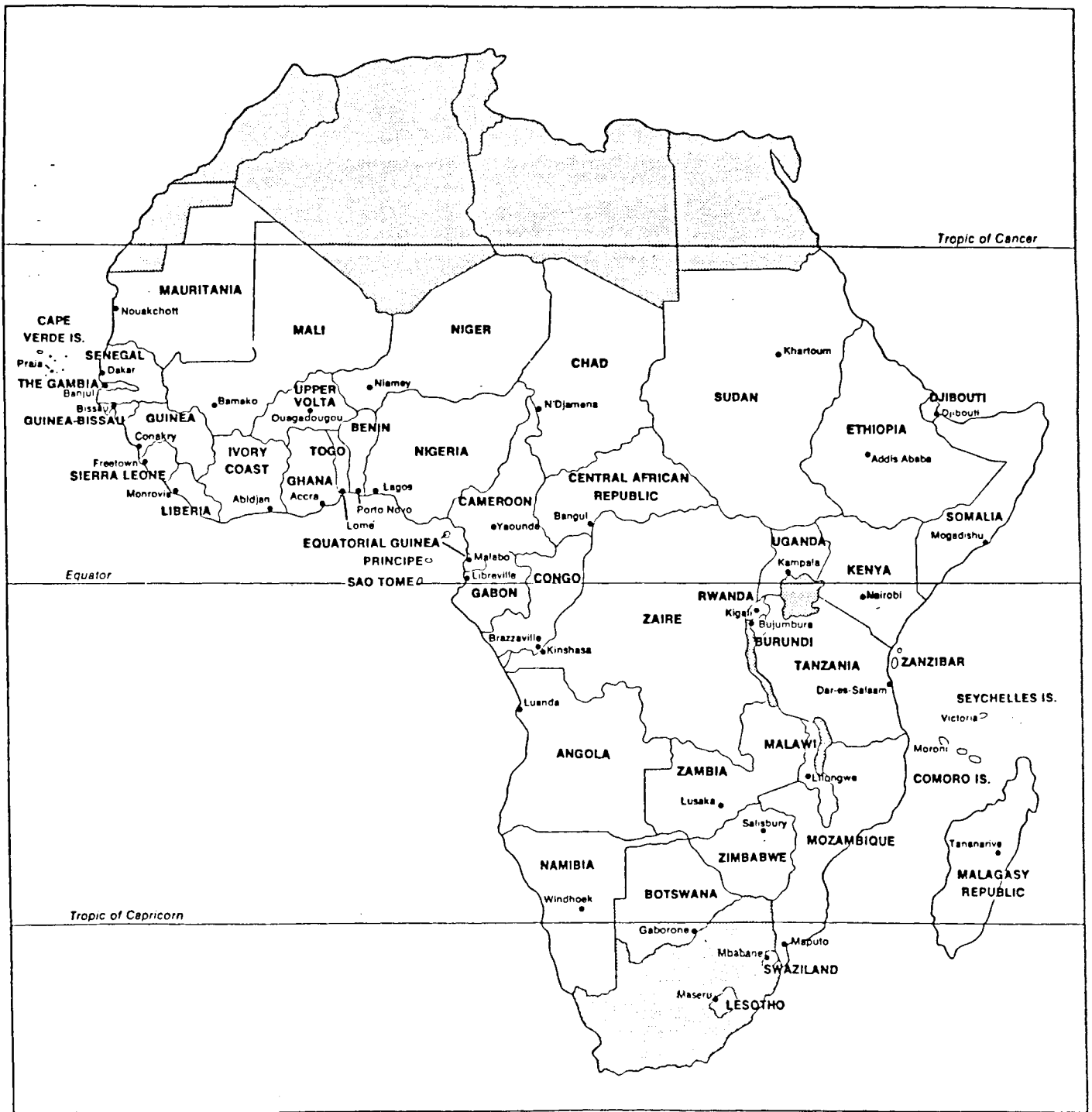
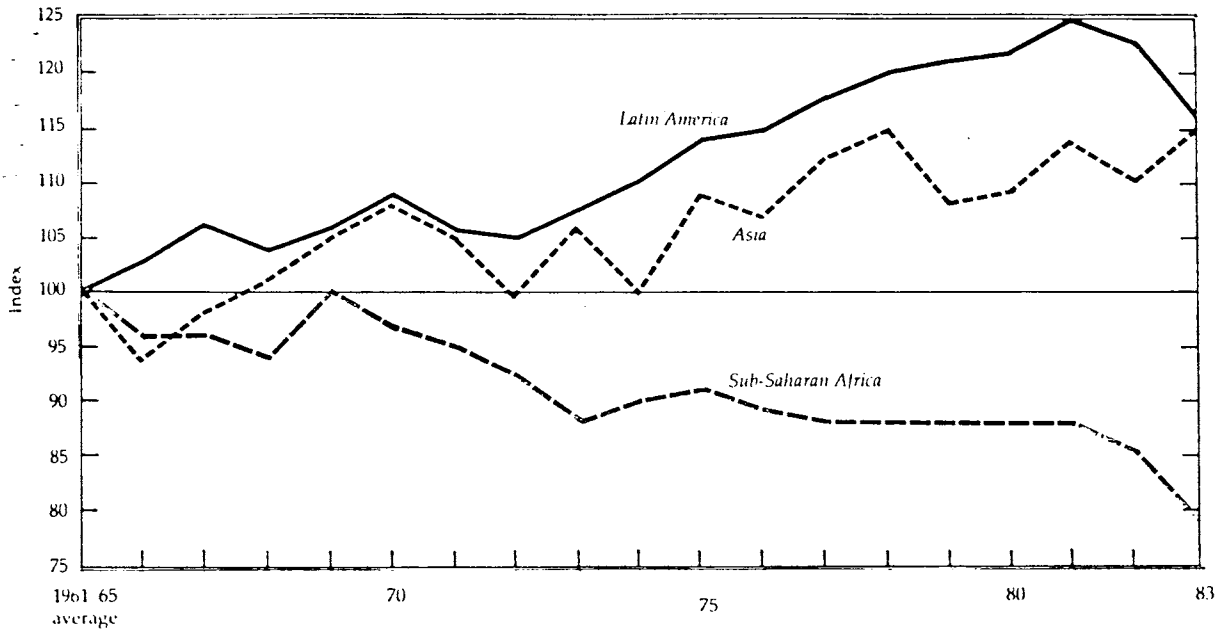


Figure 1. Countries in Sub-Saharan Africa.

Figure 2.

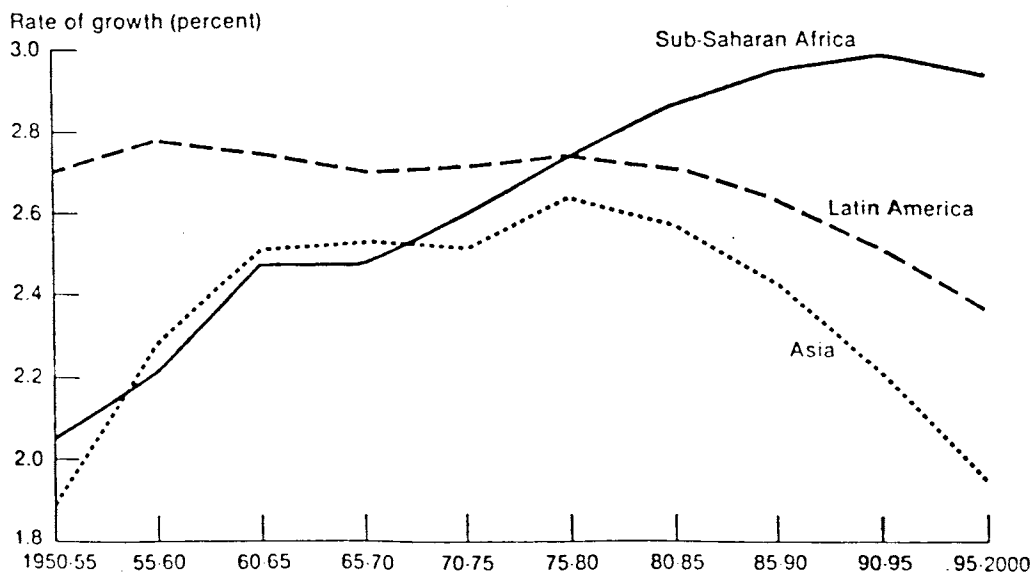
Index of Per Capita Food Production, 1961-65 to 1983
(1961-65 average = 100)



Source: Based on data provided by the U.S. Department of Agriculture.

Figure 3.

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



Source: UN, World Population Trends and Policies, Vol. I.

Table 1. Changes in Population, and Agricultural and Food Production, Total and per Capita, Tropical Africa, Selected Years

Year	Agricultural Production (AP)		Food Production (FP)	
	Average annual growth rate (%) ¹	Index of AP (1969-71=100) ²	Index of AP/capita (1969-71=100)	Index of FP/capita (1969-71=100)
	Popu- AP lation --			
1960-70	2.4 2.5	88	100	88
1971-80		108	93	109
1981-83		120	86	122
1970-82	2.8 2.1			87

Source: 1) World Bank, (1984), Toward Sustained Development, p. 58 and 82.
2) USDA, (1981 and 1984).

projects in other sectors. While agricultural production increased annually at 2.5% during the 1960s and population growth at 2.4% (Figure 3), growth of food production per capita was positive.

In 1974 a combined blow of tripled petroleum prices and drought (affecting most of the Sahel, Ethiopia, Somalia, and other countries) resulted in substantial increases in food imports and severely depleted scarce foreign exchange reserves. As population growth rates continued upward, per capita agricultural production began to fall in 1975 and has continued its downward trend. Although agricultural production has increased at an average annual rate of 2.1% from 1970 to 1982, population has grown at 2.8% per annum, leaving the per capita production growth rate negative. The index of agricultural production (with 1969-71 = 100) had reached 122 and food production 124 by 1982 but production per capita had fallen to 87 and food production per capita to 88. A year later, with

continued drought in many areas, per capita agricultural and food production had fallen to 81 and 82, respectively (Table 2).

Table 2. Indices of Agricultural and Food Production and Per Capita Production, in Tropical African Countries, 1974 to 1983 (1969-71 = 100)*

<u>Year</u>	<u>Agricultural production</u>		<u>Food production</u>	
	<u>Total</u>	<u>Per capita</u>	<u>Total</u>	<u>Per capita</u>
1974	105	94	104	93
1975	107	93	108	94
1976	107	91	109	92
1977	109	90	111	91
1978	112	90	114	91
1979	115	89	117	91
1980	118	89	120	91
1981	121	89	124	91
1982	122	87	124	88
1983	117	81	118	82

*Source: USDA, (1981 and 1984)

The depressed agricultural conditions are mirrored in the conditions of the total economies. The real growth rates of GDP per annum have fallen from 3.8% in the decade of the 1960s to 3.0% from 1970 to 1982 (World Bank, 1985, p. 58) leaving per capita real growth rates of GDP 0.6% per annum in the 1960s and 0.2% since 1970. Per capita GNP, currently averaging \$491 in 1982, has stagnated or fallen in many tropical African countries. What have been the major causes?

Major causes

Both external and internal factors have contributed to the slow growth of the economies. Externally, the world recession reduced import demand and, therefore, Africa's export earnings. Since 1974 some tropical African countries have been spending 50% of their foreign exchange earnings on petroleum; debt burdens have increased from 5.1% of export earnings in 1970

to 12.6% in 1982 (World Bank, 1984, p. 69) and will continue to rise. These two pressures on foreign exchange earnings resulted in less remaining for spare parts and materials and equipment for industry; spare parts have become critical; industry is running at low capacity. Overvalued exchange rates have favored imports over exports. Exports increased at a favorable rate of 6.2% per annum in the 1960s but fell to -0.8% from 1970 to 1982; imports increased 6.0% per annum in the 1960s and at 3.0% per annum in the later period (Ibid, p. 63). As a result, negative balances of payments have become chronic for most of these countries, contributing to the debt burdens above.

In addition to the external pressures, war, civil strife, and political instability have contributed to internal dislocations. Overvalued exchange rates have exacerbated export-import trends; neglect by governments of agriculture and misallocated resources in favor of large scale schemes to the detriment of the small farm families (which are the backbone of tropical agriculture) have contributed to the poor performance of that sector. Price policy favored vocal urban consumers [less than 22% of the total population in 1982 (Ibid, p. 85)] at the expense of farmers; export taxes further reduced the earnings of the export agricultural sector forcing those farm families to turn to domestic crops where possible; inefficient marketing systems further reduced farmer prices; spare parts shortages and high petroleum prices contributed to marketing problems. Human capital for administration, management and research/extension was extremely scarce; extension personnel did not have research output to publicize or transport to service farm families. Thus whole economies suffered.

Characteristics of the agricultural sector

Since agriculture in tropical Africa (with 360 million people) is quite different from that in India (with 700 million), a brief summary may be helpful. Agriculture in tropical Africa is 95% rainfed and small scale with the average farm size being 5 to 8 acres per family. Agriculture is labor intensive with little capital employed except on large estates or state farms, which account for less than 5% of the crop acreage. In many areas shifting cultivation is practiced; one area is cultivated for 3 to 5 years until fertility declines, then another area is cleared and planted. In the tree crop areas (coffee, cocoa, tea, rubber, etc.) land is cropped annually in the same locations. Land is owned by the ethnic group or community and allocated to families on the basis of household size; in general there is no shortage of land for agricultural purposes; unemployed urban male workers can always return to their villages and be allocated land. Over the last decade increases in agricultural production have come primarily from extended acreage, with yields remaining constant.

During the colonial period, research efforts were directed primarily toward export crops, a trend which continued for the first decade following independence but has now shifted to domestic crops. The international research centers have yet to make a significant impact on improving domestic yields, as they have on rice and wheat in India. The research centers are much newer than in Asia and have begun to cooperate with national research institutes only in the period in which human and revenue resources were very limited.

Females contribute at least 50% of the labor in African agriculture as well as being responsible for household tasks and child rearing, working

much longer total hours than males in the same communities. Women and men jointly make decisions as to crops planted and sold in many areas and women choose the seeds to be planted. Yet the extension service is largely male, relating to male farmers only, leaving the females to obtain their knowledge of new technologies through "trickle down" effects.

Governments' agricultural strategies

Initially governments believed that agricultural and livestock production could be increased easily if adequate methods of diseases and insect protection, suitable soil and agronomic conditions, and sufficient seeds were available to farmers. It soon became apparent that price and other incentives, marketing arrangements, input supplies, and other factors were also important.

(i) Pricing

Pricing policies of African governments appear to have been based primarily on political rather than economic considerations. Prices to farmers for domestic crops were kept low to favor vocal urban consumers, some of whom held successful protest rallies when governments proposed raising prices to consumers. Thus small farm families who produce 80% of the domestic and export crops had little incentive to produce beyond their subsistence needs. The negative incentives were increased when industrial production fell and wage goods on which to spend any cash surplus available became very limited. Many of these small farmers produce 50% for home consumption and 50% for the market; as prices deteriorated and population increased, subsistence production increased and marketed production fell. Relatively heavy export taxes provided disincentives to the export sector

and export quality declined as agricultural fertilizers, chemicals and other farm inputs were no longer unavailable.

As population and wage employment increased, there were significant upward pressures on the demand for food. Demand for food was often increasing at 4.5% a year¹, with agricultural production increasing at only 2.5%, contributing to the upward trend in food prices. As in most Third World countries, income elasticity of demand for food is high. Public sector employment increased rapidly putting additional pressure on urbanization and food demand.

(ii) Marketing

At independence African government officials replaced foreign marketing firms with government agencies and nationals to reduce perceived exploitation of farmers by foreign marketers. Marketing boards for domestic crops were established similar to those for export crops, and floor prices were announced for major food staples. In some countries little private sector marketing was allowed except selling in local markets. Governmental desire to increase employment resulted in marketing boards increasing the number of paid employees but efficiency did not increase; costs increased and prices to farmers fell for both export and domestic crops. Marketing agencies, whether cooperatives or marketing boards, were constrained by lack of transport due to shortages of petroleum, spare parts, and mechanics, bad roads, and deterioration of the railroads. Payments to farmers for crops marketed were often very late -- a further disincentive to the

¹ Demand for food is estimated by the simple formula
 $D = p + ng$, where D is annual change in demand for food,
 p is annual rate of population growth, n is income elasticity of
 demand and g is annual change in per capita income.

farmers. In most countries panterritorial pricing was established, which meant that comparative advantage for particular crops and areas was decreased. Parallel markets (to the marketing organizations) developed especially for the major food staples and there was widespread smuggling of food and export crops to neighboring countries offering better prices.

(iii) Research and extension

Research conducted on the research stations had little relationship to farmers' problems and communication between extension and research workers was minimal. Female-headed families, which are growing in numbers, were visited much less often by extension personnel than other families.

Low levels of human capital contributed to poor formulation, administration and extension of agricultural policies. Universities developed during and immediately after the colonial period were primarily liberal arts institutions; agricultural institutions began in the late 1960s staffed primarily by expatriates. As more staff were trained, nationals were appointed but levels of funding were low and research facilities limited.

(iv) Credit

Since the commercial banks had only 5% of their loan portfolios in agricultural loans, most African governments established agricultural development banks (ADB) or agricultural finance companies (AFC) to provide credit to the agricultural sector, especially to small farm families. These banks have had a checkered history; the largest percentage of their loans has been made for the seasonal inputs purchased off the farm. Medium term loans for agricultural implements, oxen and ploughs and long term loans for livestock development, fencing and farm structures have been

allocated at subsidized interest rates. Since land is usually not privately owned, loans for land purchases were needed only in a few countries.

It is expensive to service large numbers of small farm applications; some ADBs have made loans to cooperatives and the cooperatives on-loan to the farmers; others have administered the applications directly; still others have made group loans, with the whole group responsible for repayment. In general repayment rates have been disappointing (around 50%); of course the depressed economies and transport and other constraints have contributed; large scale farms (state farms, government parastatals, and private farms) have had lower repayment rates than small farmers. Loans for crops which are non-consumable or largely not consumed in country (tobacco, coffee, tea, cotton) have had higher repayment rates than consumable crops as the latter can be sold in the local open markets rather than through the marketing authorities and input loans are then not repaid. The subsidized interest rates are much lower than figures which would cover cost of funds, administrative costs, and the default rate and make the institutions viable.

(v) Food imports

As mentioned earlier food imports increased rapidly after the drought of 1974; the World Bank estimates that food imports grew three times as fast as population with food aid increasing substantially; more of the populations shifted their consumption to wheat and rice (the major imports), which increased food dependency and created a mismatch between local production and consumer demand (World Bank, 1981, p. 45). In general wheat and rice in these countries can only be grown at costs far above import levels.

(vi) Planning

Agricultural planning has been included in the development plans in most countries but the plans are much more objectives than blueprints; with the economies depressed in the last decade, revenue sources have been insufficient to initiate many of the plans. In addition there is often little coordination between the donor proposals and the priorities of the development plans. Data, of course, are also much more limited than in India.

What Can Be Done?

Given the major factors contributing to the poor performance of agricultural policies, what can be done to stimulate agricultural production including food? Improved incentives are thought to be among the most important factors. DeWilde, in a study of marketing and pricing in tropical Africa, concluded that farmers are increasingly marketed-oriented and have become sensitive to price changes, including changes in the structure of prices. But he noted also that price changes usually have to be strikingly greater to have a significant impact on farmers' decision processes (DeWilde, 1984, p. 117-8). Farmers attach importance to prompt payment for their products by the official marketing organizations; the frequent delays in payment have adversely affected production decisions. Price information is needed before the beginning of the planting season. Both domestic and export prices must be increased and export taxes reduced.

But pricing incentives alone are insufficient. The availability of wage (consumer) goods and production inputs can significantly affect production incentives. In most cases production inputs have been the responsibil-

ity of the public sector through the extension service or the marketing agencies. Inputs were often late or constrained by transport and foreign exchange. It is widely believed that the private sector should be encouraged to provide competition in input supply and availability.

Marketing is another area in which changes need to be made quickly. Again private sector competition is important in improving efficiency of the marketing boards. Government policy is also important in forcing agencies to be efficient, to increase farm prices, to pay farmers promptly, to provide inputs on time, and to transport production from farm to warehouse to retailers in a timely manner.

An efficient marketing system is very dependent on transport by road and rail; foreign exchange constraints have adversely affected both systems with consequent fuel, spare part, and vehicle shortages as well as materials for road repair. Thus, of crucial importance in tropical African countries is acceleration of foreign exchange earnings. Kreuger has shown that Third World economies have flourished in countries in which the export sector flourished (Kreuger, 1985). Since many of the tropical African countries have little industrial or petroleum output for possible export, agricultural commodities form the primary basis of foreign exchanges increases. It is imperative, therefore, for governments to focus on a revival of the export sector to stimulate foreign exchange earnings and the agricultural sector of the economies. The three countries which have performed best in the last decade, Ivory Coast, Kenya and Malawi have diversified exports and accelerated foreign exchange earnings.

The practice of uniform national prices for major agricultural crops which are costly to transport in relation to their bulk discriminates

against areas close to the market (e.g., milk in Kenya), increases transport costs which must be borne by the state and, in areas remote from markets, may stimulate the production of crops of smaller value to the economy than actual or potential alternatives (e.g., rice compared with cotton in Northern Ivory Coast (DeWilde, 1984, p. 120). Uniform pricing throughout the season, although easier for the government to administer, concentrates sales to the marketing agency in the early part of the marketing season, overtaxing transport, storage and personnel of the agencies.

DeWilde confirms that the parastatal marketing organizations have had inadequate standards of accountability, resulting in considerable bribery, corruption and inefficiency in their operations. He argues that the private and public sectors should be allowed to compete on fair and equal terms; governments should no longer subsidize the parastatals, encouraging them to cover costs other than in exceptional cases. The privatization of more of the marketing will not correct all the problems in the short run as foreign exchange is so essential; stimulation of foreign exchange earnings continues to be a crucial factor in corrective measures.

Realignment of overvalued exchange policies will contribute to improvements in foreign exchange generation and should stimulate initiatives in private production of some commodities formerly imported if economies are liberalized to favor the private sector.

Enrollments in agricultural universities are still low but research is underway; funds are extremely limited and well-trained faculty are lost to international institutions. Donor aid, if coordinated, could assist materially in providing additional funding and training in these institutions.

The agricultural universities allow increased opportunities for upgrading and training of extension personnel. The Training and Visit (T&V) system of extension has been introduced through donor funded projects in some countries with mixed results. It is recognized that extension services need re-organization, but the T&V system may not be optimal for Africa, given other constraints.

The extension service has normally been assigned multiple tasks of input and credit delivery and, sometimes, political education, as well as usual extension duties. These "other" tasks need to be reassigned to enable the extension personnel to deliver extension services.

Research stations are also understaffed and underfunded. Again donor aid could be of significant assistance; donors normally do not fund recurrent budgets but, for the next five years, this is needed. Efforts have already been initiated to coordinate research and extension services through farming systems teams in particular countries. Evaluation of these efforts will assist changes in other countries of the region. Regional research is also being funded by donor aid; regional research committees have been established (especially in Eastern and Central Africa), assisting research scientists to establish research priorities and disseminate results.

Population policy is one area which most African governments have not addressed. Religious and ethnic beliefs make official population policy politically unpopular. However, if African countries hope to sustain reasonably adequate levels of food production per capita, this issue will have to be addressed. Donor assistance is readily available; females are

interested in family spacing techniques; governments need to be persuaded of the necessity of the policy.

Technology transfer

Have economically viable agricultural technologies been developed in Africa similar to high yielding rice (IRRI) and wheat (CIMMYT) in India? Eicher (1984) reviewed the experience in Africa against the theoretical stages of technology transfer developed by Hayami and Ruttan (1976). The first stage is material direct transfer -- the direct transfer of materials such as seeds, machinery, pesticides and fertilizer with local adaptive trials. The second stage is design transfer -- the transfer of designs, blueprints, formulas, etc. with local training allowing scientists to carry out adaptive research to use the imported technology more effectively. Farming systems provide an example. The third stage is capacity transfer -- investment in human capital to provide scientific and technical leadership for national agricultural development.

Eicher's review of African experience in crop production finds that there have been Green-revolution-like breakthroughs in hybrid oil palms in West Africa, in cotton in the Sahel and in maize in Zimbabwe and Kenya. The maize improvement in Southern Rhodesia (Zimbabwe) took more than 28 years of painstaking research; the resulting variety, SR 52, was developed from two local varieties and not from technology transfer. There has been no comparable maize success in West Africa where maize is a less important crop. Oil palm and cotton improvements did result from transfer of genetic materials.

Four major international research centers have been established, IITA (Nigeria, for cassava, cowpeas, and crops for lowland humid tropics), ICRISAT (Niger, for millet, sorghum and groundnuts), WARDA (Liberia, for rice) and ICLA (Ethiopia, for livestock). Eicher believes that IITA, established in 1960, has made progress on improved varieties of cassava and cowpeas but has not fulfilled promised major improvements in cropping systems in the humid tropics. ICRISAT, responsible for sorghum and millet which cover two-thirds of the total cultivated area of West Africa, also has produced no major breakthroughs and what progress has been made has come from "improved locals derived from West African genetic stock."

"ICRISAT has learned that developing a research and training program appropriate to the diverse agro-ecological environments, and the current stage of Africa's absorptive capacity, is a long and painful process. The SADCC states stand to benefit from ICRISAT's experience in learning how to get its feet on the ground in West Africa over the past decade." (Eicher, 1984, p. 16)

WARDA, the international rice research institute in West Africa, has found after 7 years of trials of 4,000 improved mangrove swamp rice varieties, that only two outyielded the best local varieties. ICLA, the international livestock research station, also has not made major research improvements.

Eicher concludes that technology transfers have benefitted the oil palm, cotton and maize programs but that most donors have seriously underestimated the variability of African agriculture and the indigenous science capacity required to achieve the full potential of technology transfer. He agrees with Ruttan (1983) that:

"Only a country that established its own research capacity in agriculture can gain access to the advances in knowledge that are available to it from the global scientific community and embody the knowledge in the technology suited to its own resources and cultural endowments."

It appears that generation of improved varieties is not a quick fix; it is a long program highly dependent on a critical mass of dedicated scientists in the international centers and in the national institutions. Donors can assist in funding both of these programs.

Role of women

Gradually the important role of women in African agriculture has been documented [Spencer (1976), Delgado (1979), Due, et al (1982, 1984), Tibaijuka (1985), and others] and donor agencies, at least, convinced that agricultural policies must be broadened to include and assist women as well as men. Females work longer total hours in agriculture and household tasks than men in most regions. Females have expressed a need for labor-saving devices which assist them in their agricultural labor, yet most labor-saving devices are designed for or taken over by males. Labor-saving devices can be provided which are gender-neutral. Marketing and credit policies often discriminate against women.

Summary

To summarize, a turnaround in agricultural policy in Africa can be initiated immediately with improved incentives, marketing, high yielding varieties and other technologies, improved research and extension services, funding, and other factors but it is going to take a long time (10 to 15 years) before all the efforts bear fruit. National governments and donor agencies have to develop long term consistent policies and plan in terms of decades rather than two year spans.

Success stories

Let me turn briefly to two of the relatively successful countries, Ivory Coast on the West coast and Kenya in Eastern Africa; one a former French, and the other a former British, colony. Each will be contrasted with its nearest neighbor, Ghana on the West Coast and Tanzania in East Africa. Data in Table 3 will highlight some of the differences in the four countries.

Table 3. Comparisons of Economic Indicators of Four African Countries

	Popu- lation	GNP per cap	GNP/cap Annual growth rate	Index food per cap. 1969-71=100	Annual growth rate of agric. 1970-82
	(Millions)	1982 \$	1960-82 %	1980-82	%
Ivory Coast	8.9	950	2.1	107	4.5
Ghana	12.2	360	-1.3	72	-0.2
Kenya	18.1	390	2.8	88	4.1
Tanzania	19.8	280	1.9	88	2.8

Source: World Bank, 1984, pp. 57-8.

Situated side by side on the west African coast, Ghana and Ivory Coast at independence appeared to have excellent changes for rapid economic development. Ghana led the independence movement in 1957 and had more resources and trained personnel than the Ivory Coast in the early 1960s; both were important cocoa exporters; Ivory Coast also exported coffee. Ghana followed a mixed economy development pattern until 1962 when the president convinced the ruling party to follow a socialist path. The major industries were nationalized, government took over the farmers' cocoa cooperatives and 125 state farms were developed as an attempt to modernize small scale agriculture. When this planning failed in 1966, the country

relaxed some of the socialist ideology but a succession of political turnovers and mismanagement of the economy has led to the dismal performance shown in Table 3. Export taxes on cocoa were high; the country received more than one-third of its government revenue from this one source. Farmers were not encouraged to replace old cocoa trees with higher yielding varieties, inputs for the export crops were not always available and yields fell. The country, which was the major cocoa exporter in Africa, fell to third, then fifth place as other producers surpassed her. Poor price policy, lack of inputs and extension personnel, a corrupt marketing organization, transport difficulties and changing leadership placed a real damper on a once vigorous agricultural sector, and it grew at an annual rate of -0.2% from 1970-82.

The Ivory Coast, on the other hand, diversified its agricultural sector to increase its exports of cocoa and coffee, and added pineapples and palm oil. SODAs (Societies for the Development of Major Crops) were established to provide good prices, extension services, marketing, and processing of major export crops and rice, the major food staple. Rice production was expanded to the point of country self-sufficiency. French expatriate assistance increased after independence until more Ivorians were trained. Agriculture has grown at an annual rate of 4.5% from 1970 to 1982 and the economy has boomed with per capita GNP increasing to \$950 in 1982 compared to Ghana's per capita GNP of at \$360.

Kenya, in East Africa, followed a mixed private-public economic development strategy which included major land reform (resettlement) after independence in 1964 when many white farmers left the country. This resettlement of large European-owned farms into smallholder, titled farms

has been very successful. In addition, a relatively good price policy for the export crops, and expansion of smallholder tea through a government operated program, the Kenya Tea Development Authority (like the SODAs in the Ivory Coast), greatly expanded tea production and exports. Coffee, pineapple, and other tropical exports have remained high and further foreign exchange earnings have come from the flourishing tourist industry. Domestic agriculture has also grown (but at a slower rate than export crops) with new HYVs of maize, wheat, and other crops, although domestic marketing boards have been subject to the same criticism as those mentioned earlier -- corruption and inefficiency have surfaced. Only 11% of Kenya's total land area is arable and population increased at 4.1% per annum. Population growth was sufficiently high that the index of food production per capita (with 1969-71 as 100) was only 88 in 1980-82. Thus Kenya has a significant challenge to feed its rapidly growing population in the future given the high population growth rates. Kenya's per capita GNP had grown to \$390 per annum by 1982.

Situated southeast of Kenya, Tanzania is a much larger country but was much less developed at independence in 1961. Tanzania also is a predominantly agricultural economy with less industrial development than Kenya but with better land resources. Tanzania was a major exporter of coffee, tea and sisal at independence. In 1967 the governing party chose an African socialist path of development; all banks, insurance companies, expatriate estates, larger industry, the wholesale trade and transport were nationalized; farm families were moved from scattered holdings into ujamaa villages to provide education, health services, water and political education more

inexpensively. Each village was asked to grow acreages of communally produced crops, the revenue from which would assist in village development.

This ujamaa movement attracted much attention to development planners in other parts of Africa. However, the major movement of farm families was undertaken in 1975-76, just after the oil crisis and the drought in the Sahel and in other parts of Tanzania. Government resources to provide the social amenities fell markedly; the locations of the villages, chosen by political representatives, often were on poorer soil than formerly, water and fuel were often much farther away as was land for agricultural expansion. At the same time foreign exchange earnings were falling due to poor price policies and a decline in the supply of agricultural inputs. Marketing boards in Tanzania have also been high cost and inefficient; consumer prices have been controlled while marketed agricultural production has declined. The whole economy has been severely depressed due to foreign exchange constraints, transport failure, overvalued exchange rates, industries operating at low capacity, high oil prices and lack of competition from the private sector. Population has been increasing at almost 3.4% per annum; as a result food production per capita has fallen from 100 in 1969-71 to 88 in 1980-82 (Table 3).

Regional research

During discussion of this presentation, the question was asked as to whether or not there had been any attempt at regional development of agriculture or agricultural research in tropical Africa. There has been little regional development planning except for irrigation along rivers which flow through more than one country (for example, the Senegal river in

West Africa). However, international research institutes have been established and were described briefly earlier. Also there have been common markets; the East African Common Market covering Kenya, Tanzania and Uganda was successful in generating increased trade in agricultural and industrial products until the late 1960s; member countries then developed different political systems which led to very different development strategies and the break up of the common market. Since that time a number of coastal West African states have formed ECOWAS (Economic Cooperation of West African States). ECOWAS, formed in the mid 1970s, started common market policies slowly to avoid the mistakes of the East African Common market; already trade in industrial products has been enhanced but, since many of the countries produce similar agricultural products, growth in agricultural trade has been slower.

In Southern Africa, nine member countries have organized SADCC (Southern Africa Development Coordinating Council) to coordinate agricultural research efforts for the member countries. SADCC invited ICRISAT to establish a major research center in the region specializing in sorghum, millet and groundnuts; this research center will be near Bulawayo in Zimbabwe.

Conclusion

Agricultural output in sub-Saharan Africa has increased at more than 2% per annum since independence but population growth has surpassed agricultural production, so that production per capita is now lower than at independence. The internal and external factors which have contributed to this depressed situation have been reviewed and major policy changes highlighted.

Rapid agricultural growth will not occur over night; long term planning of concentrated, concerted effort will be necessary; human capital investments must parallel other policy changes. African countries, with low per capita GDP and with many demands on their treasuries, cannot finance the restructuring of their economies and their agricultural sectors without major infusions of donor aid over a sustained period.

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