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A STRUCTURAL VIEW OF POLICY  
ISSUES IN AFRICAN AGRICULTURAL DEVELOPMENT

by

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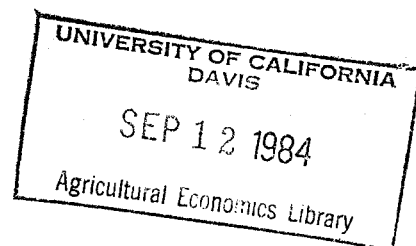
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A STRUCTURAL VIEW OF POLICY ISSUES IN  
AFRICAN AGRICULTURAL DEVELOPMENT

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INTRODUCTION

Sub-Saharan Africa is the only major region of the world where food production per capita is declining. It is also the only major region in which population growth rates are still accelerating. The latter combined with rising per capita income has caused relatively rapid growth in food consumption. As a result, imports of basic food staples have grown at some seven percent per year. The disturbing trends in food production cannot be explained by weather or civil disruption alone. They have been a feature of much of Sub-Saharan Africa for several decades. Projection of present trends to 40 million tons of imports in the year 2000 represents a major potential problem of supply, transport and financing.

The emphasis in the current policy debate, as epitomized by the World Bank (1981), is on increasing producer price incentives through higher food prices and diminishing the size of government, particularly parastatals which bring unusually high marketing costs. An alternate view emphasizes structural changes, in particular: improved research, input delivery and infrastructure systems (e.g. Lele, 1981; Christensen and Witucki, 1982; and Eicher). We argue the latter course but stress special problems arising from the dual rural-urban economies of Africa, the unusually difficult physical environment

of agriculture in Africa, and the large role of governments if the necessary structural changes are to occur. We do not disagree that agricultural prices should be at the international level or higher, but we expect supply to be highly inelastic unless accompanying structural changes occur. Similarly, we do not disagree that African governments are typically overextended, but we place emphasis on restructuring public resources towards the large expansion of public goods required for effective structural change.

#### RURAL-URBAN DUALISM

It is widely agreed that labor, especially labor during peak periods, is the key limiting resource to African agricultural production (Eicher and Baker). Furthermore, there has been a massive labor outflow from African agriculture over the past 15 years. Urbanization has occurred at the rate of 6.5% per annum over the 1960's and 1970's. As of 1979, 17 percent of sub-Saharan Africa's labor force was in the urban service sector, compared to 71 percent in agriculture (World Bank, 1981). Labor shortage is becoming particularly acute in West Africa in particular (Gbetibouo and Delgado), and is a significant factor in the decline of food production.

Rapid migration of labor to urban areas and consequent labor shortage in agriculture results from very low productivity in agriculture and very high urban wages. The ratio of real unskilled wages in agriculture to nonagriculture in Kenya varied from 20 to 25 percent over the 1972 to 1983 period. Comparable ratios for the same period in Ivory Coast and Upper Volta were 40 to 50 percent (Ranade,

Jha and Delgado). Overall rural-urban income disparities on the continent typically range between 1:4 and 1:9, compared with many countries in Asia with ratios of 1:2 to 1:2.5 (Lele, 1981).

### CAUSES OF RURAL-URBAN DUALISM

#### Low Productivity of the Agricultural Base

Labor productivity in the agriculture of Sub-Saharan Africa is very low, even by Asian standards. The rate of growth of yield increase for the major foodgrains in most African countries over the 1960's and 1970's was negligible (Paulino in MDB). Furthermore, the adaptive model of technology transfer will not be sufficient to deal with African problems. Spencer cites the case of the West African Rice Development Association, which screened 2000 varieties of improved (mainly Asian) upland rice over seven years: only two of them did better than local varieties, primarily because of disease and pests (MDB).

Thus, the poor record of production growth and the low incomes in agriculture are understandable in terms of the nature of physical land resources, especially outside highland areas of East Africa. In semi-arid West Africa, soils are typically of low natural fertility with about half the organic content and water-holding capacity of semi-arid tropical soils in South Asia (Matlon in MDB). In the humid and sub-humid tropics of Sub-Saharan Africa, production potential typically decreases while moving from the less to more humid zones (ter Kuile in MDB). This is because of decreasing solar radiation, decreasing soil fertility and greater fragility, and increasing incidence of pests and diseases. In East and Central Africa, potential is somewhat more

clearly linked to rainfall and elevation (Collinson in MDB). However, rainfall in Eastern Africa, as in semi-arid Western Africa, is especially variable by world standards (de Vries and de Wit in MDB), and adds a particular element of uncertainty to cropping.

#### Large Capital Inflows

On the other hand, returns to urban employment are relatively high, substantially because of large capital inflows. A major factor has been the growth of official development assistance, which was just under 20 percent per annum in nominal terms between 1973 and 1980 for Sub-Saharan Africa as a whole. In 1981, net disbursements of ODA to at least three of the Sahelian countries--Mali, Mauritania, and Upper Volta--were in excess of one-quarter of GDP. In wealthier and more populous countries such as Nigeria, the role of ODA was minimal, however government oil revenues averaged one-quarter of GDP from 1977 to 1981 (IMF).

These large capital inflows can be considered "exogenous", since they do not require cost competitive production behavior to secure them. It is not realistic, or desirable, to believe that agricultural problems can or will be solved by delinking national economies from these sources of inflow. Rather, agricultural policies need to be built around these forces.

The effect of these large capital inflows on African agriculture may be split into the resource movement effect and the spending effect, components of the "Dutch Disease" model of asymmetric growth (Corden and Neary, Oyejide in MDB). The resource movement effect consists in the drawing of domestic skilled manpower and other resources into the booming sector, at the expense of other activities. If the

booming sector is government services supported by foreign assistance, a heavy user of domestic resources, this effect may be major.

The spending effect comes from the manner in which the income arising from these inflows is spent, typically on importables and services. In Africa, this is likely to be of major importance, particularly since a large component of aid is technical assistance with the implied multiplier effects of expatriate consumption patterns.

Furthermore, when large exogenous capital inflows are coupled with a relatively higher rate of protection to nonagriculture, as is almost universally the case in Sub-Saharan Africa, the result is typically an overvalued exchange rate (Oyejide in MDB). This leads to decreased incomes for already low-income agricultural producers of both food for home consumption and commodities for export.

#### Political Forces

Another force serving to maintain the dual economy is bound up with the politics of new nation states. Fragile politically and foreign-dominated financially at independence, governments had every incentive to expand central government budgets as rapidly as possible, to gain control both of the polity and economy. Furthermore, the very rapid expansion of expectations at independence put great pressure on governments to provide services and show material results, even where economic conditions did not warrant such activity. It is not surprising therefore that parastatal activity grew very rapidly in the 1960's and 1970's in Sub-Saharan Africa. This expansion was perforce achieved through agricultural taxation. Even in countries as clearly identified with private sector initiatives as Ivory Coast, enterprises with significant government participation grew from a

negligible number in 1960 to 200 in 1980, including 53 parastatals staffed by civil servants (France, Ministry of Foreign Affairs).

A further political factor is that increasing urbanization over time and the growth of the service sector progressively strengthens urban lobbies relative to disorganized smallholders, with consequent success in protection of urban industry and efforts to reduce agricultural prices.

Finally, scarcity of trained people, the consequent heavy use of expatriates and the demonstrated effect on local salaries results in huge salary differentials between high and low paid persons. For example, the current ratio between the highest paid and the lowest paid civil servant in the United States is 8:1; in India it is 5:1; in Nigeria it is 20:1. Such disparities within the nonagricultural sector tend to pull the wages of a relatively small number of unskilled urban workers up relative to the earnings of agricultural producers.

#### THE PRICE INCENTIVE PARADIGM

While "getting prices right" is inately attractive as a simple, quick prescription for poor performance in agriculture, the preceding discussion provides the basis for understanding why it is not likely to be a sufficient condition for accelerated agricultural growth. The price incentive paradigm presumes use of donor leverage to transfer income from a relatively small number of urban producers of non-tradable services and consumers of importables to a relatively large number of rural producers of exportables. This would be done by a combination of devaluation, tariff reform, and direct pricing policy action to shift the internal terms of trade in favor of agricultural



producers. Shrinking the size of government is a key aspect of this package, both to reduce the revenue imperative of governments which must be satisfied by soaking agriculture, and to reduce the level of market-distorting intervention by parastatals, which are seen as vehicles for depressing the internal terms of trade against agriculture. Many governments have recently responded to the call for these reforms, either out of conviction or necessity (Christensen and Witucki).

The available data, however, although scant, are not reassuring as to the success of the price incentive paradigm. It is noteworthy that in a recent attempt to argue the case for an elastic aggregate agricultural supply response to price in Africa (Bond), the price coefficients obtained in a time series regression analysis for nine countries using aggregate data were statistically insignificant in seven cases. The eighth can be discounted because of omission of a control variable for the effects of weather on prices and production, leaving one significant long-term supply response coefficient. This was for Kenya, an atypical country in this respect where high potential agriculture and relatively developed infrastructure suggests such a capability. Nevertheless, the long run response elasticity estimated was only 0.16 (ibid.).

A major reason for low supply elasticity in Sub-Saharan Africa is the poor state of agricultural infrastructure and input distribution systems in Africa (Olayide and Idachaba in MDB). This is of course reinforced by difficult resource conditions, initially low input intensity, and the inadequacy of existing technologies for lowland semi-arid and humid areas (Vallaeys, Silvestre and Blackie in MDB).

More important, while the elasticity of supply in African agriculture is probably unitary with respect to labor input, the supply of labor is probably quite inelastic. First, small increases in the marginal value product of labor due to price policy do not fundamentally change the incentive to work in nonagriculture, given the magnitude of the differential between sectors. Second, the three to one ratio of rural to urban labor forces implies that a ten percent increase in the former would require a thirty percent decrease in the latter. This is hard to envisage, even in the dynamic sense of slackened rural-to-urban migration.

#### THE STRUCTURAL CHANGE PARADIGM

The principle problem in developing much of Sub-Saharan agriculture is how to deal with a difficult and variable resource base in an economic environment where agricultural production costs, especially in terms of the opportunity costs of labor, are constantly being pushed upwards by factors outside the agricultural sector. The immediate implication is that growth in production will be dependent upon technological innovation that cuts per unit costs, especially labor costs. Central to this process is the provision of better input delivery systems, rural infrastructure, agricultural research and extension systems, and increasing the supply of decision-makers who can make the whole system work. Without these, price changes are likely to have at best once and for all effects, and most likely small ones at that. The need in Africa is for substantial sustained acceleration in the agricultural growth rate.

Increasing the Input Intensity of African Agriculture and Creation  
of Rural Infrastructure

It is clear that a low input-intensity process of agricultural development is even less feasible in Africa than in other parts of the world. This is precisely because of the very poor fertility and fragility of much of the arable soils and the often high, but greatly variable rainfall. In fact, fertilizer consumption was less than 5 kg./ha. in the early 1980's in more than half of the 39 Sub-Saharan countries considered by Paulino (MDB). In the first instance, a substantial increase in input intensity means that necessary distribution channels have to be developed. This in turn requires substantial investment in the transport and communications infrastructure, both to provide inputs and market outputs. The costs of such investment should not be underestimated; in isolation from an already highly productive agriculture in densely populated zones, it is unlikely that such investments will pass standard short-run rate of return criteria. Furthermore, it is clear from past experience that these investments need to be directed to items that support smallholder production systems rather than capital-intensive large-scale state farms. Finally, it is clear that much is not known about how to best provide inputs to smallholders and how to use them, especially under highly variable local conditions (Matlon). The scope for technical and policy research here is especially large.

The Need for Agricultural Research

Agricultural research is clearly central to the problem of providing sustained growth in labor productivity in Africa's difficult physical

environment. Yet the necessary institutional and technological development will not take place in a research environment increasingly dominated by short-term production-project related work, as has recently been the case in Africa. Many of the existing technological breakthroughs on the continent, such as the development of Zimbabwe hybrid maize, have their roots in research studies undertaken by a single group of scientists over several decades.

Most regions of Africa have yet to evolve the post-colonial research centers and universities that stimulated agricultural growth in Asia. The changing patterns of donor assistance in the 1970's in Africa, relative to those in the 1950's and 1960's in Asia, must share some of the blame for this situation. Building effective regional and national research systems capable of doing basic as well as adaptive research is clearly the first priority for long-term acceleration of food production growth rates.

#### Building Institutional and Human Capacity for Growth

In the policy research sphere, much basic work remains to be done in Sub-Saharan Africa to understand basic processes associated with agricultural issues. Since these processes are never by definition static, institutions must be created to respond to this need. National aspirations, the need for continuity in staffing and priorities, and the need for insights into a complex socio-economic environment mandate that these institutions exist at the national level. This has important implications for the demand for skilled manpower, especially in the smaller countries.

More generally, development of agriculture in Africa, as elsewhere, will be a brain-intensive process requiring significant investment in

higher education to this end. This serves not only to increase the supply of a key scarce resource--informed decision-making power--but also to provide the constituency for the creation and implementation of research results. National and donor efforts, or the lack thereof, to support creation of national facilities of agriculture in Africa over the last decade should be reviewed in this context, and then compared to the Asian experience a decade earlier.

#### THE ROLE OF NATIONAL GOVERNMENTS

National governments have a big role to play in the development of agriculture in Sub-Saharan Africa for three sets of reasons. These pertain to the allocative role to be played among public goods, among geographic regions, and between agriculture and other sectors.

First, the discussion above indicated that large increases in public goods such as rural infrastructure, research, and education will be required. Given the scarcity of resources and the non-capturability of benefits, institutions of government must make informed choices.

Second, the variability of the resource base and a production imperative suggest that the higher potential regions of African countries will quickly move ahead of lower potential regions. However, in practice these definitions may apply to micro areas close to each other, in addition to ethnically distinct geographic regions. Willy nilly, strong pressures to assist the lower potential regions will arise on both political and equity grounds. At the very least, governments will surely have to play a role in easing the transition in the lower potential areas.

Third, the case was made above that a number of quasi-inevitable structural processes, grounded in the history and political economy of Africa, will continue to favor nonagriculture over agriculture. Furthermore, the manifestation of these processes, such as an overvalued real exchange rate under import-substituting industrialization and mineral rents, will probably be beyond the capacity of agriculturally-oriented policy to change. Therefore, it appears likely that in many African nations, governments will need to intervene in a "second-best" sense to provide equal effective protection to agriculture. The type of intervention needed will change over time and require continued complex analysis by institutions of government.

#### THE ORGANIZATION OF RURAL PEOPLE

Precisely because the allocative role of government is so important in African agriculture, the primary requirement for agricultural development is a political lobby to secure resources and attention to the problems of the sector. Examples of successful agriculture are not lacking in Africa--cotton in southern Mali, tea in Kenya, maize in Zimbabwe, cocoa in Ivory Coast--and they all share two common attributes. First, they were all accompanied by a heavy provision by the state of research, extension, infrastructure, and an assured market. Second, farmers in the relevant zones were organized into a politically powerful voice to secure resources and to keep parastatal service organizations in check.

An associated issue stems from the massive nature of resource requirements relative to availability. This is especially true for those services which local people most vigorously demand: roads, schools, and public health facilities. These must come substantially

from increased taxation at the local level, and will not be forthcoming if local people are not organized to provide them.

Finally, if equity issues are to be dealt with, lower income people must themselves be organized. Rural organization reflecting existing power structures may well be effective for bringing agricultural growth through interaction with national level institutions. However, those structures are less likely to deal effectively with the special problems of the poor. This may require support from the national government in order to redress the local level imbalance in power between the well-to-do and the not-so-well-to-do.

FOOTNOTES

\* Coordinator for African Research and Director, respectively, of the International Food Policy Research Institute. We have drawn heavily from the 35 papers and discussion at the University of Zimbabwe - IFPRI Conference on Accelerating Agricultural Growth in Sub-Saharan Africa, held at Victoria Falls, Zimbabwe in August, 1983 (Mellor, Delgado and Blackie), henceforth referred to as MDB).



REFERENCES

- Bond, Marian E. "Agricultural Responses to Prices in Sub-Saharan African Countries." IMF STAFF Papers 30(1983)703-26.
- Christensen, Cheryl and Larry Witucki. "Food Problems and Emerging Policy Responses in Sub-Saharan Africa." American Journal of Agricultural Economics 64(1982):889-96.
- Corden, W. M. and J. P. Neary. "Booming Sector and De-Industrialization In a Small Open Economy." The Economic Journal 92(1982): 825-48.
- Eicher, Carl K. "Facing Up to Africa's Food Crisis." Foreign Affairs, Vol. 61, No. 1 (1982), pp. 151-174.
- France, Ministry of Foreign Affairs. Public Enterprises in Ivory Coast. Development Studies Sub-directorate, no. 49, June 1982.
- Gbetibouo, Mathurin, and Christopher L. Delgado. "Lessons and Constraints of Export Crop-Led Growth: Cocoa in Ivory Coast." The Political Economy of Ivory Coast, eds. I. William Zartman and Christopher L. Delgado, pp.115-47. New York: Praeger, 1984.
- International Monetary Fund. International Financial Statistics. Washington, D.C.: 1983 Yearbook.
- Lele, Uma. "Rural Africa: Modernization, Equity and Long-Term Development." Science 211(1981):547-53.
- Mellor, John W., Christopher L. Delgado and Malcolm Blackie. Accelerating Agricultural growth in Sub-Saharan Africa. Washington, D.C.: International Food Policy Research Institute and Johns Hopkins University Press, forthcoming.

Ranade, C. G., Dayanatha Jha and Christopher Delgado. "Technological Change, Production Costs and Supply Response." Paper prepared for for IFPRI workshop on Food and Agricultural Price Policy, Belmont Estate, Elkridge, MD, 29 April-2 May, 1984.

World Bank. Accelerated Development in Sub-Saharan Africa: An Agenda for Action. Washington, D. C.: October, 1981.