

**RESTRUCTURING FOOD SYSTEMS TO SUPPORT A
TRANSFORMATION OF AGRICULTURE IN
SUB-SAHARAN AFRICA:
EXPERIENCE AND ISSUES**

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**John M. Staatz, T.S. Jayne, David Tschirley, James D. Shaffer, Josué Dioné, James Oehmke,
and Michael T. Weber**

Michigan State University

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During the 1980s and early 1990s, almost all African governments began restructuring their countries' agricultural markets, input distribution systems, exchange rate and foreign trade regulations, agricultural research systems, statistical services, and other agricultural support systems. The motivation for restructuring was twofold. First, the systems had become very expensive. Governments could not pay the systems' large and growing costs, and donors were increasingly reluctant to foot the bill. In Zambia, for example, maize subsidies accounted for 17% of the total government budget in the late 1980s (Howard et al.).

More importantly, the agricultural support systems were not providing the benefits expected of them. In some cases they were counter-productive, acting as barriers to improved economic performance rather than providing the orderly markets and incentives to increase production anticipated by their instigators. The calls for restructuring agricultural support systems (particularly calls for market liberalization) were based on the belief that market-driven systems would be more effective in stimulating growth and structural transformation than were the bureaucratically driven systems previously in place.

Yet, as Schmid points out, there are a myriad of ways of constituting a market, each with its own consequences for the growth path and pattern of development that ensues. The purpose of this paper is to use observations from the past decade's experience to help understand the relationships between policies advocated in the restructuring efforts and the process of structural transformation. We stress the central role that well-functioning systems of exchange play in structural transformation, income generation, and food security. We argue that for these exchange systems to function well, certain types of collective action are crucial. A key dilemma in Africa is how to design incentives for such collective action that promote structural transformation rather than just turning into an opportunity for rent seeking. The paper gives little emphasis to the role of reforming agricultural research systems, although some of the observations we make about constituting effective exchange systems may also apply to strengthening national agricultural research systems.

Part I of the paper places the issue of reform of exchange systems in Sub-Saharan Africa within the context of the broader structural transformation of African economies. This section stresses how the transactions costs inherent in many of the current exchange systems in Africa retard structural transformation and productivity growth. Part II examines what recent research findings have taught us about the impact of reforms over the past 10 years on the performance of agricultural support systems, particularly markets, in Africa. Section III draws implications for the design of future research and policy.

I. SYSTEMS OF EXCHANGE AND STRUCTURAL TRANSFORMATION

No country has ever achieved major increases in productivity and the material standard of living of its citizens without a *structural transformation* of its economy. Structural transformation involves a net transfer of resources from agriculture to other sectors of the economy, so that agriculture ends up accounting for a smaller proportion of output and employment in the economy. In most successful transformations, this transfer is achieved through productivity growth in agriculture coupled with changes in the intersectoral terms of trade (including taxation) (Mellor). The reasons for this relative shift away from agriculture (increasing labor productivity in agriculture, Engel's law, etc.) have been extensively discussed in the development literature since the 1950s (e.g., Döring; Timmer).

Structural transformation inherently entails a movement away from subsistence-oriented, household-level production towards an integrated economy based on specialization and exchange. Through this process of integration, individuals gain access to the knowledge systems of the wider world, as embodied in new technologies, management practices, and institutions.

However, the process of transformation that makes higher living standards possible also makes farm households more dependent on and vulnerable to the performance of a broader set of exchange systems for inputs, consumer goods including food, and income. Rural households have little control over these systems, and their dependence on them for basic necessities is a source of uncertainty. While most farm households in Sub-Saharan Africa (SSA) participate in the market economy, most hedge their bets by trying to produce the bulk of their food themselves. The fact that many farm households have failed to meet their food needs through home production and depend upon markets and food aid is less an indication of success of the transformation than of failure of subsistence agriculture to cope with increasing population pressure and the vagaries of the weather. The irony is that food security for a large proportion of farm households, given the conditions in much of SSA, requires dependence on markets.

Transaction Costs and Modes of Exchange

Whether structural transformation actually takes place, and the nature of the growth paths it engenders, depend critically on the cost of exchange (transaction costs) within the economy. These costs are determined by the structure of *exchange systems*, which we define as the mechanisms through which people carry out economic transactions. Exchange systems include various types of markets and contracting, intra-firm and bureaucratic transfer mechanisms, and

economic interchange based on kinship obligations, etc.¹

The movement away from autarky makes possible a new set of production possibilities using inputs acquired through exchange, allows the household and the economy to benefit from the economies of size that accompany specialization, spreads risk of supply and demand shocks over a broader geographic area, and ultimately broadens the household's consumption choices (Bromley and Chavas). Yet the ability to capture the gains from specialization is limited by the size of the market. The size of the market is in turn influenced by transaction costs. These costs include the ex-ante costs of collecting the information necessary to decide whether to engage in exchange, negotiating the deal, and the ex-post costs of contract monitoring and enforcement. Where these expected costs exceed the expected gains from exchange, no transaction takes place. Furthermore, since households vary in the transactions costs they face, the extent of market participation varies across households (DeJanvry, Fafchamps, and Sadoulet). The degree to which households differ in the transaction costs they face greatly influences how much various households rely on markets as part of their food-security and income-generation strategies and who benefits during the structural transformation.

All transactions can be viewed as some form of explicit or implicit contract. The nature of the contract, however, varies depending on the characteristics of the good or service being exchanged, the nature of the assets involved in its production, the frequency of the exchange, and the degree of uncertainty surrounding the exchange (Williamson, pp. 68-84). Where the performance of the good being exchanged is easily verifiable at the time of the trade, few highly specific assets are at risk in production, and future contingencies do not strongly affect the mutual benefits gained from the exchange, relatively simple contracts clearly delimiting the obligations of both parties and spelling out all contingencies can adequately govern the exchange. Such contracts (which Williamson calls *classical contracting*) correspond to many of the spot markets one sees for agricultural products in Africa.

As more uncertainty surrounds the outcome of a transaction (for example, as contracts cover a longer period, during which it is impossible to predict all future contingencies) and as more specialized assets are put at risk in production, spot market becomes subject to increased transaction costs. The need for more complex forms of contracting arises to facilitate trade. Because it is impossible to specify all future contingencies, contracts in more complex goods and services necessarily become incomplete. Thus, mechanisms such as third-party arbitration and on-going renegotiation of contract terms become necessary to deal with future contingencies. Because performance of the exchange takes place over time, agents incur costs of monitoring their trading partners' performance. Hence, exchange of these more complicated goods and services involve higher transaction costs. Spot markets are not well-suited to handling these additional transaction costs. The size of the market may be restricted as households revert to autarkic patterns of resource allocation unless alternative mechanisms (various forms of explicit contracting across firms, vertical integration, etc.) evolve to govern these transactions (*ibid.*)

¹Markets can include a wide range of pricing mechanisms, from auctions to posted prices to private treaty. In this paper, *spot markets* refer primarily to "traditional markets" for agricultural products where prices are set by haggling (private treaty). These markets deal exclusively in already-produced goods--i.e., they do not involve any sort of forward contracts.

Spot Markets

Structural transformation involves a movement towards more round-about production of these complex goods and services. While spot markets often are well-suited to allocate supplies of already-produced goods efficiently, they are less suited to guide production of complex goods and services because they impose substantial risk on investment in specialized production processes requiring future planning (*ibid.*; Galbraith). Market liberalization programs in SSA have focused much of their attention on trying to develop and improve the performance of spot markets. But spot markets may not be appropriate for promoting many of the types of productivity-enhancing investments and production processes associated with specialization, economies of scale and the structural transformation. A major challenge in fostering transformation is how to develop broader-based institutions for governing more complex transactions (contingent pricing mechanisms, franchising arrangements, etc.).

In much of SSA, high uncertainty about future production (a function of unpredictable weather) and government and donor policies, impacted information, and unreliable contract enforcement mechanisms lead to very high transaction costs, especially across markets that rely on impersonal exchange.² The risk of reliance on these markets is particularly high for households operating at the margin of survival, where small fluctuations in real income can have disastrous consequences. Traditionally, when households and firms in SSA have had to deal with incomplete contracting situations, they have attempted to lower the transaction costs of trading in markets through engaging in a highly personalized system of exchange (e.g., within the village or along ethnic or kinship lines in bureaucracies and markets) and through internalizing transactions within the household or firm.

Research from throughout SSA has documented how such high transaction costs have constrained economic growth. A large proportion of rural households typically strive to meet their food needs through their own production as much as possible (Goetz, Jayne, Tschirley and Weber 1993); use little or no credit to finance productive activities (Government of Zimbabwe); and use little hired labor, relying mostly on labor available from the nuclear or extended family (*ibid.* Goetz).

The attempt of rural households to satisfy the bulk of their food, credit, and labor requirements internally is both cause and consequence of thinly traded markets and low-productivity agriculture. Specialization and productivity are retarded by a vicious cycle: thinly traded, volatile markets entrench incentives to engage in self-provisioning of food, labor, credit and other goods, and self-sufficiency behavior reinforces the thinness and volatility of markets. Market thinness reduces the potential to exploit economies of scale in distribution, keeping marketing costs high, widening further the wedge between producer and consumer prices, and further reinforcing households' incentives to minimize their reliance on markets (Kangasniemi et al.)

Such market performance is consistent with the "efficient but poor" hypothesis of Schultz and others about rural economic systems. Marketing margins may be in line with costs, but these

²A system of impersonal exchange is a sine qua non of exploiting the gains from mass production of consumer goods. See North.

costs are high, and commercial activity is reduced. Efficiency in this context does not necessarily induce specialization, investment and growth (Shaffer et al.). Incentives to invest in new technology and expand production are impeded by the thinness and volatility of the market. When markets become volatile and unreliable, and households seek to minimize their reliance on them, access to food is determined mostly by the household's resources available for direct production of food. Where such resources are distributed highly unevenly (e.g., as with land in Mozambique and Zimbabwe), the consequences both for efficiency and income distribution can be severe (Tschirley and Weber 1993; Jackson and Collier).

Public Sector Marketing Agencies

The development of stabilization funds, marketing boards, government storage programs and a variety of pricing policies during the 1970s (often promoted by donors) was a response to the uncertainties of the markets facing farm households. It was believed that more reliable, stable, orderly, markets would contribute to the structural transformation. The diagnosis was essentially correct. Instability and unreliability of spot markets are and have been major barriers to the transformation. They impede long-term planning by farmers, traders, and consumers, and often destabilize the macro-economy through their effects on real wage rates and the government budget. The problem was that once created, many of these state marketing organizations took on other objectives. Distribution of political patronage, providing jobs for friends and kin of those in charge, and rent seeking often dominated (Bates). The organizations were often efficient in pursuing these objectives, but the objectives were incompatible with a broad-based structural transformation. The way these programs were instituted, that is the rules, the standard operating procedures, the customs and the political pressures, along with inadequate information systems, created perverse incentives for the participants, dooming the programs to eventual failure. A key question for current policy remains how to institute the necessary policies and programs to make markets more reliable while avoiding such perverse incentives.

Personalized Systems of Exchange

Personalized systems of exchange have perpetuated themselves largely because of the high costs and risks associated with reliance on thinly traded and unstable markets with weak contract enforcement potential. These personalized systems often combine exchanges in goods or inputs with contingent insurance contracts that protect vulnerable households against adverse events (Platteau). For example, one household may provide labor to a more established household in exchange for land use and the promise of food in the event of a crisis. While these personalized systems of exchange have been reasonably successfully in achieving their insurance objectives, they are poorly designed to achieve the rapid growth in productivity necessary for a transformation out of poverty. Three important limitations of traditional systems of personalized exchange are: (1) they cannot fulfill their insurance function when the entire village is hit with severe drought; (2) their insurance potential, which relies largely on land allocation, is progressively undermined by population growth and land pressure; and (3) by limiting the scope of exchange, they restrict the capacity to benefit from specialization and economies of scale. Consider ethnic trading networks. The advantage of such networks is that contracts are less costly to enforce within the ethnic group than across ethnic lines. Yet as the number of groups in an economy that trades only within the group and not across groups

increase, the number of potential trades within the economy declines exponentially. Consequently, the economy is soon forced back towards autarky (Robison).

Two other costs of highly personalized exchange systems are that they can restrict resource mobility (by making it more costly for "outsiders" to enter a particular activity) and they color perceptions of the justice of the economic system. To the extent that participants view their chances of success in the economic system as depending more on who they know than what they know or can produce, they may opt out of the system.

Internalizing Transactions within the Firm

An alternative to highly personalized market exchange is internalization of transactions within the firm. When carried out at the household level, the costs of such autarky are high, as outlined above. Yet in some parts of Africa, larger organizations have successfully integrated a broad range of transactions internally. The CFDT/CMDT model of cotton production in Mali (and of allied systems in other parts of Francophone West Africa) is perhaps the most successful model of such vertical integration in Africa. This model involves a French multi-national (the CFDT) contracting with a national counterpart organization (in Mali, the CMDT) owned jointly by CFDT and the state. CFDT provides improved technology, lines of credit, and links to international markets, while CMDT handles local input provision, extension, and collection of cotton to the point of export. By integrating research, input provision, credit, and output marketing within one organization, the system has successfully promoted technical innovation while avoiding many of the risks inherent in dealing across markets (Lele, Van de Walle, and Gbetibouo; Dioné, 1991).

The drawbacks of such a vertically integrated system are the high level of investment it requires (which is not likely to be forthcoming for many activities--especially food crops) and the concentration of income that may result. While the CMDT/CFDT system has spread its benefits fairly widely in southeastern Mali, there are plenty of examples of vertically integrated enclave (plantation) agriculture in Africa that have led to highly concentrated distributions of incomes. For example, in Malawi, survey data indicates that laborers on the cash crop estates are generally worse off than those tilling their own small plots of land (Christiansen and Kidd, Lele). The level of benefits accruing from an exchange economy and their allocation are dependent on the rules of the economy as well as the potential productivity of the system.

II. RECENT RESEARCH FINDINGS AND IMPLICATIONS FOR THE DESIGN OF POLICIES TO IMPROVE PERFORMANCE OF EXCHANGE SYSTEMS

Crucial Role of Rural Food Markets in Household Food Strategies

One of the most striking results of recent research in SSA is the large number of rural households that rely on food markets as part of their income-generation and food-security strategies. In contrast to the image of the self-sufficient African farmer, in many countries a high proportion of smallholders are net buyers of basic staples (Weber et al.). Hence, the capacity of rural food markets to deliver food reliably and at low cost to these households is

critical to improving real incomes and food security as well as incentives for regional and farm-level specialization (Staatz and Bernstein; Goetz; Jayne; Tschirley and Weber 1993).

Many of the initial market reforms of the 1980s focused on increasing the incentives of farmers to produce food for the urban market. These reforms emphasized improvements in rural-urban transportation and removal of movement restrictions along major highways to improve evacuation of surpluses from rural areas. Much less attention has been given to improving intra-rural systems of distribution, seasonal credit, and storage, which are crucial to improving the reliability and predictability of rural food markets.

The potential impact of such improvements in rural market functioning are illustrated by simple simulations of the effects on farm revenues of modest reductions in intra-year price variability in grain-deficit regions of southern Mali. In these areas, seasonal price volatility (as measured by the coefficient of variation of monthly prices) is usually double that of major urban areas (Kangasniemi et al., pp. 12-14). Because of market uncertainty, farmers' liquidity constraints, and other factors, grain often flows out of these areas to urban markets immediately after harvest, but has to be shipped back to the areas in the pre-harvest hungry period. The additional transport costs involved thus contribute to the marked seasonality of prices.

The simulations are based on three years of farm-panel data covering grain production, sales, and purchases. The analysis indicates that if improvements in rural marketing systems raised post-harvest prices 20% and reduced pre-harvest prices by 15-20%, the net revenues of households that are currently forced by cash-flow constraints to sell grain early in the marketing season and re-purchase it later in the hungry season would rise by 17-33%, depending on the year (D'Agostino, Staatz, and Weber).

The reliance of rural households on the market for a significant part of their staple food supply, especially during the pre-harvest hungry season, implies that they must be trading other goods and services to finance those purchases (see Reardon et al. for details on rural income diversification in SSA). The functioning of exchange systems for these goods and services strongly influences the ability of rural households to rely on rural food markets as one of the elements of their food security strategy. Until recently, most reform programs have paid much less attention to these exchange systems than to the functioning of food markets that link rural and urban areas.

Policy Does Make a Difference

Recent research has also demonstrated that reforms of exchange systems in SSA *have* often improved food system performance. Quantifying the impacts of the reforms is difficult, however. It requires disentangling the effects of changes in government policies on supply response from other exogenous factors, such as increases in rainfall. More fundamentally, it involves speculating about what the situation would have been without the reforms, which is surely different from the situation before the reforms. The motivation for the reforms was that previous policies were unsustainable; yet projecting how the situation would have evolved in the absence of the reforms is inherently conjectural.

This caveat notwithstanding, there is evidence of improved food system performance in many countries where reforms have occurred. In Mali, marketing margins for coarse grains fell about 20% along major trade routes supplying Bamako over the period 1987-93, when market reforms gained their greatest momentum (Staatz and Dembélé). This was accompanied by substantial increases in private traders' investments in transport and other trade equipment, expansion of storage capacity, and expansion of private-sector employment in marketing (Dembélé, forthcoming). Similarly, recent liberalization of maize marketing in Zambia has been accompanied by rapid increases in production by large, commercial farmers (Howard et al). Shifts in managerial responsibility for irrigated rice perimeters from parastatals to smallholders has resulted in dramatic increases in production and reduced costs in Mauritania (Berg) and Mali.³ In Ghana, both food and cocoa production have showed strong supply response to the reforms launched in 1983 aimed at reversing the policies of what Frimpong-Ansah referred to as "the vampire state" (Frimpong-Ansah; Commander et al.). Recent analysis of macro-economic data by Steven Block also suggests increases in multi-factor productivity in the agricultural sectors of many African countries in recent years, likely due in part to the policy reforms.

Policy reform can even have positive effects under conditions of civil war. In Mozambique, the progressive elimination of geographic monopolies and product movement restrictions, and the replacement of fixed prices with minimum price policies on grains has facilitated the development of an active private trading network throughout the southern portion of the country. Increasingly, outlying consumer markets are integrated with larger urban markets through trade flows of key commodities. This marketing system has helped distribute monetized food aid widely despite the breakdown of the state's administrative distribution system.

The reforms have also often had their intended effects of reducing the drain on public resources. The reform of numerous state enterprises has eliminated a major drain on national budgets, freeing resources for other uses (Commander).

Factors Influencing the Effectiveness of Policy Reform

Despite these successes, the reforms of exchange systems within SSA have had less dramatic impacts than first envisioned by the advocates of such reforms. Several factors have influenced the effectiveness of the reforms.

Conceptualization of the Reforms: Governance and the Myth of "Privatization"

One of the major constraints to success of the reforms has been the view that the key objective was simply to reduce government "intervention" in the market. The prescription was to "privatize" trade by selling off state assets and enterprises to the private sector. Until recently, much less attention has been given to the collective action needed, particularly in the area of governance (e.g., contract enforcement and market information), to make market-oriented

³In 1992, rice production in Mali increased 57% compared with the previous year, in large part due to decentralization of management and the widespread adoption of transplanting in the Office du Niger.

economies perform well. While it is true that governments in Africa (and elsewhere) are prone to making mistakes in their role in the governance of economic activity, the evidence shows that mistakes are made both in what is done and what is left undone.

In its most extreme form, the view of "reform as privatization" that prevailed in the early to mid 1980s implicitly ignored that private property is always public in the sense that it is only through public sanction that legitimate market behavior (as opposed, for example, to theft) is defined.⁴ The polity is an inseparable part of the market because some collective action is always necessary to bring uncertainty and transaction costs down to a level that provides incentives for participation in markets. Hence, the key question is not whether to "deregulate" markets but what set of regulations is needed to structure exchange systems to induce good performance (Reich, pp. 185-95; Schmid).

The failure to stress the positive role of collective action in improving market performance can lead to misguided policies. For example, one of the frequent arguments for the elimination of parastatals was that many of these organizations were inefficient and corrupt, rife with nepotism, ethnic favoritism, and greed. The advocates of privatization saw abolishing these organizations as a way of eliminating these shortcomings.

Yet the characteristics of parastatal governance mentioned above also exist within "free" markets in many countries. Instead of manifesting in diversion of government funds, they feature misleading grades and measurements, shaky or arbitrary contract enforcement, opportunism and oligopolistic behavior, which erect high transaction costs, discourage exchange and keep markets thin and unreliable. For example, Klitgaard describes the watering-down of milk by vendors in India that raised inspection costs, reduced demand, and eventually resulted in market failure. The situation was rectified with the introduction of government quality control standards. Another example concerns the method of price determination in horticulture auction markets in Pakistan, whereby the farmer was informed of the price only if she/he won the bid. The system was designed to deprive farmers of transparent market information and depress farm-gate prices.

A critical task, then, is not simply "privatizing", but sorting out appropriate roles for private and collective action. A well-functioning "private" market requires an active public sector, but one that is active in areas other than direct state control of trade that has occupied many governments' attention to date. Particularly important are improved information systems and impartial ways for adjudicating commercial disputes (Staatz, Dembélé and Aldridge; Schmid; North). Movements towards political decentralization and the establishment of commercial courts, as in Mali recently, may play extremely important roles in improving "private" market performance if these new systems of governance operate honestly.

⁴Occasionally one sees a truly deregulated market in which no broad-based public regulation over private activity exists. These examples of "free markets", such as in Somalia in 1992, are hardly models for development.

Transcendent Issues of Public Finance

Food policies in most African countries are strongly influenced by the basic need of the state to raise public revenues. Given the low levels of literacy, administrative capacity, and written records concerning earnings and land ownership most of SSA, governments rely heavily on indirect taxes (especially import and export levies and license fees) to finance their operations. In Mali, Senegal, and Cote d'Ivoire, for example, import taxes on rice are a major source of government income. Decisions to import may be driven more by the immediate financial needs of the state than by market conditions within the country. Calls for reforms of marketing policies (e.g., abolishing such "distortionary taxes") that fail to account for the basic need of governments to finance themselves are likely to be ignored by hard-pressed officials unless accompanied by workable alternatives for raising revenue.

Abolishing such indirect taxation could also hurt the private sector if it led to reduced expenditures on market infrastructure and delays in the payments of public salaries. Deteriorating infrastructure increases marketing costs. Failure to pay public employees on time can dramatically reduce urban effective demand for basic staples and soak up much of the informal credit in the marketing system that otherwise would finance working capital (Staatz, Dioné, and Dembélé). Experience from throughout SSA has also shown that when public employees are not paid on time or are not paid a living wage, they frequently use their positions to extract bribes that greatly increase the transactions costs of marketing. Hence, a major challenge is to fashion reforms that reduce perverse incentives on marketing agents while still providing the state with a workable means of financing its legitimate operations.

Importance of a Food Systems Perspective

For structural transformation to occur, an entire range of production activities from technology development and input provision through delivery to the final consumer need to be coordinated. For a given commodity, these links can be analyzed in a subsector perspective. Failure to understand how actions taken at one stage in the vertical chain affect behavior at other levels has often led to poor diagnoses of the basic constraints to improved food system performance. For example, in much of Eastern and Southern Africa, grain systems are organized such that the regulations circumscribing the choice of market outlets open to farmers largely predetermine the subsequent flow of grain and access to it at other stages in the marketing system. Restrictions on access to maize by small-scale manufacturers of less-expensive and less-refined maize meals have fostered a conventional wisdom until recently that the dominance of white, highly refined maize meal in urban consumption patterns was a result of consumer preferences. This view was also promoted by decades of advertising by the large millers of refined meal (Stewart). However, studies in Zimbabwe and Mozambique suggest substantial demand for the less refined and less expensive white meals produced by small hammer mills. Barriers at other stages of the marketing system often prevent these consumer preferences from being articulated through the market (Jayne and Rubey 1993).

Furthermore, yellow maize has made substantial inroads into urban consumption patterns in Mozambique and Zambia, where market forces have made it freely available alongside white

maize in the marketplace.⁵ In Mozambique, two years of price data reveal a price premium on white grain over yellow grain of only about 30%, far less than most casual observers would expect. More refined yellow meals are preferred by many consumers to less refined white meals. But overwhelmingly, poor consumers purchase unrefined yellow meal, because the market has been allowed to price this product below all others. This has been possible because of the unrestricted operation of small hammer mills.

These examples also illustrate that productivity is not just an outgrowth of on-farm production innovations. Because hammer mills produce maize meal with a higher extraction rate and at lower cost than large-scale industrial mills, a relative shift in consumption to less-refined meal would allow national food requirements to be met using fewer resources and at a lower cost to the consumer. More efficient food markets also allow rural households in grain-deficit areas to meet their food requirements at lower cost, thus freeing up resources for cash cropping and non-farm activities in line with a new pattern of regional comparative advantage (Jayne 1993). Moreover, since yellow maize has lower production costs than white maize, both regionally and outside Africa, marketing changes that allow consumer preferences to determine demand and price levels may simultaneously induce higher on-farm productivity and promote self-targeting. Finally, allowing consumers to choose yellow grain and meals in the market gives the country access to a more robust and stable world market and thus improves the possibility of using trade to stabilize domestic grain markets.

The importance of coordinating activities throughout a subsector is illustrated by the relative success of cotton production in the Francophone countries, where the CFDT played the key coordinating role, in contrast to the situation in most of the Anglophone countries following independence (Lele, Van de Walle, and Gbetibouo). The few examples of such effective coordination in African agriculture have been led by commercially oriented firms producing crops for export. Where the profit motive was not strong (e.g., in marketing boards having access to the state treasury) or where locational rents in production were small, as in food crop production for the domestic market, attempts to coordinate an entire subsector within the confines of a single firm have proven financially unsustainable. Examples include attempts by the Malian cotton parastatal, CMDT, to promote intensive maize production in southern Mali in the mid 1980s, and government attempts to boost maize production in Zambia in the late 1980s (Boughton; Howard et al.). A key challenge is whether alternative ways can be found to coordinate such subsectors (e.g., through various forms of contracting) that lower total costs of production and distribution and allow farmers and processors to take advantage of improved technologies.

Domestic Food Markets Don't Operate in Isolation

Reforms aimed at improving the performance of markets for basic staples in Africa have sometimes paid insufficient attention to linkages across markets. Because markets are linked across space, time, and commodities, conditions in one market often affect performance in connected markets. Improving performance of domestic grain markets, for example, may

⁵See Tschirley et al. (1993b and 1993c) and Weber et al. for discussions of this issue in Mozambique.

require addressing problems in connected markets.

Linkages across countries. The reforms have generally taken account of the linkages among markets for the same commodity across countries. Indeed, one of the motivations for the reforms in both southern and western Africa was the concern that national agricultural policies had been designed without taking into account the policies of neighboring countries. Consequently, trade flows across borders were frequently driven more by rents generated by divergent national policies than by underlying comparative advantage (Barry et al.; Coste; Kingsbury).

Linkages across commodities. Policy makers have paid less attention to the impact of linkages across commodities. For example, in 1988/89, in the face of record cereal production, the government of Mali attempted to promote grain exports to neighboring countries. The government lifted all previous legal restrictions on grain exports. Yet grain exports to Mauritania (which had also removed all restrictions on grain imports) remained clandestine, often carried out at night in small lots. It was not immediately apparent why the trade did not become more open and try to exploit the economies of larger-scale transactions. Subsequent research by Gabre-Madhin showed that because the Mauritanian currency was not freely convertible, most of the trade was carried out in kind. Malian traders exchanged their cereals for other consumer goods, whose import into Mauritania had been highly subsidized by the government. Export of these consumer goods from Mauritania was illegal, as was their import into Mali. Hence, constraints in markets for foreign exchange and for consumer goods strongly influenced the performance of the cereals markets.

Linkages between Markets for Inputs and Outputs. In response to market failure, exchange systems may evolve that combine the markets for labor, land, credit and insurance with a single contract. For example, failures in land markets in Senegal have made access to credit difficult. Larger and more established farmers enable credit-constrained families to obtain inputs for cash cropping (such as peanut seed) and access to food by agreeing to work as laborers on the larger farms. Through this form of personalized exchange, the scarcity of cash-crop inputs may lead to lower food production (Goetz). In Malawi, failure of rural food and financial markets has caused a vicious cycle in which better-off farmers use food stocks to buy labor at planting time from food insecure households with immediate food needs. This weakens the latter's ability to grow sufficient food for themselves that would otherwise unhook them from this dependency relationship.

Linkages between the Markets for Cash Crops and Food Crops. Perhaps the most crucial link that has not received enough attention until recently is that between cash crops and food crops. When it has been addressed, frequently the assumption has been that there is a strong tradeoff between the production of cash crops for export and food crops. More recent research has indicated important synergies between the two (von Braun, Kennedy and Bouis; Dioné 1989; Dioné 1991; Jayne 1993). On the one hand, revenues from cash-cropping frequently play an important role in building farm-level and community-level capital, which also benefits food crop production. On the other hand, improving the reliability of food markets in rural areas may be a precondition for widespread adoption of cash-cropping.

The role played by cotton in promoting and sustaining a broad range of productive activities in Southeastern Mali illustrates how synergies among cash crops and other farm and non-farm

activities can facilitate farm- and community-level capital formation (Dioné, 1989; Dioné, 1991). First, through agronomic interactions, cereals have benefitted from efforts in research, extension, and purchased input and implement distribution primarily aimed at increasing cotton yields and output. For instance, cotton growers in southeast Mali produce 2 to 3 times more foodgrain per capita than farmers not involved in cash-cropping in comparable agro-ecological zones. Second, because of its relatively guaranteed outlets and price, cotton serves as a quasi-collateral for loans, which facilitates farmers' access to formal credit. Increased access to formal credit in turn enables farmers to invest in equipment for crop production and post-harvest activities. Cotton income further supports capitalizing farms through investment in diversification of income sources. Hence, development in livestock production and off-farm activities such as small trade in Southeast Mali is largely the result of diversified reinvestment of savings from cotton income. Revenues from cotton have also financed the development of rural infrastructure, especially roads, which also benefits grain marketing.

The experience of Zimbabwe illustrates how improvements in rural food markets may be a precondition for broader adoption of cash crops. Jayne has shown how policy-related restrictions on the movement and resale of maize in rural Zimbabwe drive a large wedge between the selling and acquisition price of grain, even in the same vicinity. This wedge discourages food-deficit households from undertaking cash-crop and non-farm activities that could otherwise raise their incomes. For the grain-purchasing households, the opportunity cost of cash crop and non-farm activities is the cost of acquiring the grain foregone by cultivating cash crops, which is related to acquisition costs of food rather than selling prices. The larger the wedge, the greater the incentive to meet household grain consumption requirements before diversifying into other enterprises. More efficient and productive systems of bringing food to rural areas may be a precondition for stimulating dynamic changes in crop mix and non-farm activities that increase the productivity of the system.

Relative Importance of Supply Constraints and Demand Constraints

Most market reforms have implicitly assumed that the primary constraint to improved performance is on the supply side--usually inefficient marketing arrangements that lead to large marketing margins, untimely arrival of inputs, etc. Yet there is evidence that in some for some of these markets in some parts of SSA, the constraints may be more a lack of effective demand.

This is most clearly seen in the market for inputs such as fertilizers and improved seeds. In some parts of SSA, particularly in well-watered highlands, it appears that constraints to expanded use of fertilizer and improved seeds lie mostly on the supply side. In Malawi, for example, the nitrogen-maize price ratio exceeds 11:1. By contrast, in India, Pakistan and the Philippines, comparable rice or wheat-based ratios are in the range of 3:1 or less (Byerlee). Under supply-constrained conditions, developing lower-cost, more reliable delivery systems may substantially expand input use. For example, liberalization of seed marketing in Malawi has led to an expansion in the area planted to hybrid seed from less than 5% in the mid 1980s to almost 15% in 1990 (Smale).

In contrast, in more semi-arid areas, where rainfall is more erratic, effective demand may be a more important constraint than inefficient delivery systems. Kelly showed that the major reasons for the "poor performance" of the liberalization of the fertilizer market in Senegal in

mid 1980s were the high risks and low payoffs to using fertilizer at unsubsidized prices, combined with credit constraints.

While most apparent in the markets for agricultural inputs, effective demand constraints also hinder the performance of staple food markets in SSA. With greater income growth, it is likely that many of the market gluts that appear in African grain markets in good rainfall years would be quickly absorbed by people who currently need such grain but lack the money to purchase it. The dilemma is how to get such income growth without first improving the performance of these markets.

Investment in Domestic Policy Analysis Capacity

The payoffs to reform have been most effective when as part of the reform process, there has been a concerted effort to strengthen domestic capacity for ongoing research and analysis to inform the reform process. Because of the paucity of data on food systems in most SSA countries, most reforms are necessarily designed initially on the basis of scanty empirical information. The strengthening of domestic analysis capacity allows a mechanism for on-going monitoring of food system performance in response to the reforms and provides a mechanism for mid-course corrections as researchers uncover new empirical information. Given the ongoing nature of the reforms, it is unlikely that outside consultants alone can assure the continuity of monitoring, analysis and evaluation needed to help guide the reforms.

The ability of on-going local research to inform policy in a timely way is illustrated by experience from Rwanda. In the early 1980s, the government had proposed higher support prices for beans to encourage local production and raise rural incomes. The government decided not to implement the policy, however, based on local research results indicating that most Rwandan farmers were net bean buyers and that much of the local bean supply was imported informally from neighboring countries (Loveridge). The generation of demand-driven policy analysis has been illustrated recently in Zimbabwe. President Mugabe's call for analysis of policy options to expand the role of small-scale maize mills was motivated largely by results of earlier research within the government and at the University of Zimbabwe.

III. DIRECTIONS FOR FUTURE POLICY AND RESEARCH

The classical prescription of many of the market reforms is that governments should get out of the direct buying and selling of commodities and focus on the provision of "hard" and "soft" infrastructure. Hard infrastructure includes roads, basic communications systems, public market places, and the like. Soft infrastructure refers to facilitating sets of rules, market information services, contract enforcement mechanisms, etc.

This traditional prescription has merit. Yet it begs the hard question of how to create effective governance systems both to maintain the infrastructure and to achieve the low transaction costs necessary for structural transformation. Effective exchange systems require a set of rules, enforcement agencies, and collective action to provide important public goods and critical inputs that are beyond the current capacity or willingness of private investors to provide. Problems of opportunistic behavior arise in both markets and in the bureaucracies of regulatory and

infrastructure agencies. If the pay of government workers is so low that they must take bribes to meet the needs of their families, or if kinship or ethnic obligations dictate conversion of public agencies to provide privilege and benefits to kin or clan, the prospects that public agencies will enhance economic performance is very limited. Much attention must be paid to incentive structures in both public and private organizations. There is unfortunately no general prescription to the solution of the dilemma created by coexisting market and bureaucratic failure.

There is also no optimum set of rules for regulating and facilitating markets that is universally applicable to all economies at all times. Economic governance systems evolve. The current situation and the past history of each economy matter. Economists have to accept that many of the barriers to economic development do not have economic policy solutions. And in many cases the patient will not take the prescribed medicine. Policy prescriptions disregarding these realities have little chance of success.

Because of the very small size of the economies of SSA it is difficult to achieve the economics of scale and specialization without substantial international trade. It is difficult to develop internationally competitive industries without attracting investment and importing technical inputs, including technical and organizational knowledge. A major barrier to international trade and capital flows to SSA is high transactions costs. Transactions costs are greatly influenced by the regulatory environment and the existence and efficiency of related markets. The problem is that achieving economies of scale and competing in international markets requires relatively large organizations. Given the very thin markets in most African countries, creating or importing such large organizations (such as the CMDT) often results in monopoly or at best monopolistic competition. Monopoly power creates the potential for both economic exploitation and political influence. Regulation is needed and regulation creates the potential for a market in regulatory decisions.

There is therefore need to explore how to foster various forms of joint ventures and contracting arrangements between Africans and foreign firms that transfer a package of capital, technical skills, and organizational knowledge necessary to produce improved technical inputs, consumer goods, employment opportunities, and human capital, while at the same time preventing the abuses outlined above. For the structural transformation to take place, work must move from the farms to specialized firms providing inputs and consumer goods. Workers in these nonfarm industries must earn incomes to provide the effective demand required to make it profitable to increase productivity in agriculture. Experience from throughout the world has shown that when properly structured, such joint ventures can play a critical role in promoting growth and transformation of both local firms and the broader economy (Marsden; Reich). Yet few foreign firms will be willing to participate in such arrangements without the facilitating functions of African governments.

Furthermore, the transition is prone to derailment due to the development of barriers or bottlenecks in the form of missing inputs and facilitating institutions or the existence of institutions creating incentives inconsistent with development. This calls for some sort of development planning based upon careful analysis of dynamics of the system in transition. This would include attention to both policy and technology. A minimalist government limited to contract enforcement is attractive given the problems of bureaucratic failure, but we believe the problems of markets and the importance of public goods in development require a more

proactive government strategy, if government leaders seek improved levels of living for the ordinary people.

An institutional innovation that may have particular potential is the development of international franchising. This provides the most direct transfer of a package of knowledge dealing with production and distribution. Perhaps the aid agencies could provide leadership and seed money for the development of an international association of franchisors with potential interest in Africa. This could be supported with research identifying both potentially profitable opportunities and policy actions by governments which would both make franchising investments attractive and at the same time protect from potential opportunistic actions.

In addition to the need for reform of domestic governance structures in SSA, we believe the international community has an important role to play in fostering the development of more productive exchange systems, beyond its current support of market liberalization efforts. Most of the people in SSA have been left behind in the great increase in productivity of the modern world economy. To bring the people of SSA along in the world economic development process, the industrialized world must look beyond the short-run problems and provide opportunities for trade and employment with investments and the transfer of knowledge. We believe the lessons from the cotton subsector in Francophone West Africa are particularly instructive. New international institutions, such as the franchising arrangements and joint ventures discussed above, are needed to promote private investment and knowledge transfer. The agricultural economics profession can contribute to this process by giving greater attention to the opportunities for and constraints to such arrangements when carrying out future studies of market reform in Africa.

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