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## Market-Oriented Strategies to Improve Household Access to Food: Experience from Sub-Saharan Africa

by

**T.S. Jayne, D.L. Tschirley, John M. Staatz, James D. Shaffer, Michael T. Weber, Munhamo Chisvo, and Mulinge Mukumbu**

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T.S. Jayne and D.L. Tschirley are Assistant Professors and John M. Staatz, James D. Shaffer, and Michael T. Weber are Professors in the Department of Agricultural Economics, MSU. Munhamo Chisvo is Research Scholar, University of Zimbabwe, and Mulinge Mukumbu is Research Scholar, PAM/KMDP/Egerton University, Kenya.

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## EXECUTIVE SUMMARY

The objectives of this report are to identify market-oriented strategies to alleviate both chronic and transitory food insecurity, and to examine the interactions between short-run targeting mechanisms and longer-run strategies designed to alleviate the chronic causes of inadequate access to food.

The main premise of the report is that sustained improvements in household access to food in Sub-Saharan Africa require the development of more reliable food and input markets that (a) create incentives to adopt cost-reducing investments at various stages in the food system; and (b) offer incentives for rural households to shift from a subsistence-oriented pattern of production and consumption to more productive systems based on specialization and gains from exchange.

Sustained productivity growth in most parts of the world has typically entailed some form of *structural transformation*, which, in the historical development processes of other regions, has been a prerequisite for broad-based and sustained growth in productivity, real incomes and purchasing power throughout society. Structural transformation involves a movement away from subsistence-oriented, household-level production toward an integrated economy based on specialization and exchange. But specialization makes households dependent on the performance of exchange systems. The ability to capture the productivity gains from new technology and specialization thus depends on reducing the risks and uncertainty of market-based exchange, thereby facilitating greater participation in the types of specialized production and consumption patterns involved in the process of structural transformation.

Section 3 presents empirical evidence from research conducted in Africa to draw conclusions about how the design of agricultural policies and transfer programs have affected household access to food in both rural and urban areas.

Based on the foregoing, section 4 presents the following guidelines for the design of strategies to promote access to food in Africa:

(1.) *Focus on achieving productivity gains in the food system*. Government and donor disaster relief programs to protect vulnerable groups' access to food during transitory crises will be more successful and less costly when combined with strategies to alleviate the chronic causes of poverty. This requires a focus on achieving productivity gains in the food system that increase incomes and reduce the real costs of food over time. The scale of vulnerability to drought and other transitory crises in Africa is primarily due to structural causes of poverty related to low-productivity agricultural systems. Since poverty is the major underlying cause of food access problems, measures to increase real incomes and reduce food costs are crucial, and both of these are achieved mainly through productivity growth.

(2.) *Focus on how food and income transfer programs can be designed to promote the long-run development of the food system – the basis for providing food for most people over the*

*long run – in addition to providing food to people in the short run.* We have provided examples of how program food aid (monetized) can both help and hinder the development of competitive markets. Public works programs, while not the focus of this report, are another strategy designed to promote both longer-run development objectives as well as emergency feeding.

Better synergies between disaster relief programs and long run development of the food system can be facilitated by:

(a) encouraging governments and donors to invest in local analytical capabilities to better understand the behavior of the food system into which food aid is injected;

(b) encouraging donors to coordinate food and income transfer activities;

(c) eliciting information from an array of private traders and other participants in the food system regarding how markets would respond to the influences of proposed food and income transfer programs; and

(d) working with government agencies, trade associations, and other non-state organizations to invest in critical public goods, such as market information systems, communication networks, a process for establishing legal foundations of markets, and contract enforcement capabilities.

(3.) *Focus on reducing consumer food costs by expanding the range of products available to produce and consume*. Accurate knowledge of consumer behavior (e.g. knowledge of demand for products currently not in the market) can guide market development programs to improve availability of low-cost foods to food, particularly for low-income consumers. Existing consumption patterns, in numerous cases, are largely policy-driven and may obscure policy makers' perceptions of how market reform would affect urban consumers, a politically sensitive group. More accurate knowledge of how consumer choices would respond to the availability of a broader range of products, and how market development might affect product availability and price, may raise policy makers' receptiveness to undertaking food market reform programs that promote food access.

Market restructuring can also increase food system productivity by affecting farmer incentives to adopt new farm-level technologies and by inducing use of more appropriate technology in processing and marketing.

Consumer subsidies may not promote food security if the subsidies entrench a relatively high-cost food system and prevent lower-costs alternative channels from developing. We provide several examples of how untargeted subsidies on some refined staple products have had regressive distributional effects, and have hampered the development of a more productive and employment-intensive system from evolving.

(4.) *Focus on the cost and reliability of food supplies to rural areas as a component of non-farm, livestock, and other income diversification strategies designed to promote access to food over the longer run*. It is difficult to exploit cash crop/non-farm employment and income opportunities when food markets cannot assure a reliable supply of food to buy in rural areas and when the costs of making food available in rural areas are so high that other activities become unviable. Poorly designed export promotion programs can exacerbate food insecurity.

(5.) *Focus on developing local analytical expertise to help guide food system development*. Lasting policy change depends critically on governments' actual belief in the analysis supporting the reforms. There is ample experience showing that governments that have reluctantly undertaken reform programs have reversed them and reimposed the old system of price and trading controls as soon as a drought or other transitory shock has occurred. The demand for, and credibility of, food policy analysis to guide market development is enhanced by a collaborative research process in which local researchers and government analysts can take "ownership" of the research findings. The process of generating local ownership of research findings helps to create a common empirical foundation for donor/host country dialogue. In these ways, the manner in which food policy research is undertaken may be as important as the research findings themselves.

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# 1. INTRODUCTION

The elimination of hunger and poverty is arguably the greatest challenge facing sub-Saharan Africa (SSA). Meeting this challenge will require some form of transformation out of the semi-subsistence, low-input, low-productivity poverty trap that characterizes much of rural SSA. The history of economic development indicates that productivity growth has been the major source of sustained improvements in food entitlements and nutrition, and that major increases in productivity for most countries will require a *structural transformation* of its economy. In most successful transformations, productivity growth in agriculture has played the central role of raising rural incomes, stimulating demand for manufactured goods, and releasing labor to other sectors through increases in farm productivity, thus transferring resources to other sectors of the economy (Mellor 1990).

The root problem of inadequate access to food is poverty – the failure of the economic system to generate sufficient income and distribute it broadly enough to meet households' basic needs. The problem can be addressed by either (a) giving food directly to the poor (non-market distribution of aid), (b) increasing their incomes so that they have greater entitlement to food through the market (given existing marketing costs), and/or (c) reducing the costs of food delivered through markets by fostering technical and institutional innovations in farm-level production and the marketing system.

The purpose of this report is to identify market-oriented strategies to alleviate both chronic and transitory food insecurity, and to examine the interactions between short-run targeting mechanisms and longer-run strategies that alleviate the chronic causes of inadequate access to food.

We focus on market-oriented strategies for two reasons. First, the role of market-oriented strategies within a broader framework to target assistance to vulnerable groups is often neglected. Targeting vulnerable groups is often conceived in terms of drought relief distribution, supplemental feeding programs, public works programs, and other forms of administered transfer programs. While mechanisms to transfer income and/or food to vulnerable groups will always be required to alleviate food insecurity, even in high-income countries, the topic of appropriate transfer mechanisms under specific conditions is discussed in depth by others and is not the focus of this report (see, for example, von Braun, Kennedy, and Bouis 1990; GAO 1993; Kangasniemi et al. 1993; Lundberg and Diskin 1994).

Second, a focus on market-oriented, poverty-based strategies is necessary to alleviate the chronic factors that keep large portions of the rural population entrenched in semi-subsistence, low-productivity rural economic systems. Sustained income growth is primarily a function of productivity growth. Productivity growth has typically entailed some form of structural transformation, featuring increased reliance on market exchange systems. A market-based approach to improving food access would thus reduce the number of people requiring non-market targeting assistance and simultaneously build the type of institutions and infrastructure that fosters structural transformation.

While not focusing on short-term transfer programs *per se,* we stress that the design and implementation of these transfer programs may either support or retard longer run market-based efforts to alleviate poverty and food insecurity. A major challenge that governments face is to implement targeted assistance programs that achieve their short-run goals while not clashing with the long-run objectives of employment expansion, productivity growth, and the development of markets required to achieve these objectives. This report draws from the experiences of selected targeted assistance programs in Africa to help governments, USAID missions, and NGO agencies design targeted assistance strategies that reduce the trade-off between short-run and long-run objectives. Two related reports (Diskin 1994a; Lundberg and Diskin 1994) provide more detail on the design and merits of such programs.

The report is organized as follows: Section 2 presents a stylized description of the rural socio-economy that gives rise to poverty and inadequate access to food for many African households. This section is necessarily broad, pulling together the literature on chronic and transitory causes of food insecurity – coping strategies, household capital accumulation and decumulation processes, technology adoption, the performance of markets, linkages between farm and non-farm activities, traditional institutions that constrain income growth, and government policies. The purpose of this section is to describe and diagnose the major causes of poverty and food insecurity within the low-productivity rural economies found in many African countries. Discussion is limited to crop-based rather than livestock-based agrarian systems and their interaction with the broader rural economy. This section stresses that the transformation out of low-productivity agriculture will require reductions in the costs of transacting and investing in market-oriented production processes associated with structural transformation. The evolution to more efficient exchange systems is likely to require substantial collective action, both from government and the private sector.

Section 3 uses empirical case studies from research conducted in countries of southern and eastern Africa and the Sahel to draw lessons about how the design of agricultural policies and transfer programs have affected food access, in the short run and long run, by large segments of the rural and urban population.

Based on the foregoing, section 4 presents conclusions about the potential to enhance access to food through market-oriented strategies.

## 2. CAUSES OF INADEQUATE ACCESS TO FOOD

### 2.1. Who Are the Vulnerable?

Applied research in SSA has identified three groups especially vulnerable to chronic and transitory food insecurity:

(1) A large group of asset-poor people in rural areas who farm, but are often net purchasers of food. They lack the resources to either produce enough food to feed themselves or generate enough income to buy their residual food requirements. This group includes a disproportionate number of female-headed households and households in war-torn and environmentally-disrupted areas.

(2) Landless laborers, whose numbers are increasing in SSA (Lipton 1985a; Collier 1989; Webb, von Braun, and Yohannes 1992; Bassett and Crummey 1993). Landless households are almost entirely dependent on labor markets or traditional, kin-based exchange systems to secure their income and food.

(3) Urban households with unemployed or, more frequently, underemployed family members. These groups typically have low levels of education and skill training, and employment is often only temporary. Dissaving is common in the face of frequent unanticipated disruptions to their low income streams.[1]

Food entitlements for these groups are exacerbated by the skewed distribution of assets and property rights commonly found in SSA. Rapidly growing populations throughout the region imply ever greater competition for land resources even in areas previously viewed as "land-abundant." But while a more equal distribution of resources would improve the ability of the poorest people to acquire food, the more fundamental problem is the very low productivity of the economies in much of Africa. There is currently not much to redistribute.

### 2.2. Productivity Growth, Systems of Exchange, and Structural Transformation

Structural transformation involves a movement away from subsistence-oriented, household-level production toward an integrated economy based on specialization and exchange. 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

[1] While we do not focus on pastoral systems, it is clear that pastoralists are also especially subject to inadequate food access. At the same time that scarce grain supplies push grain prices up, distress sales of livestock typically push these prices down. Thus, pastoralists are often caught liquidating their principal assets at precisely the time these assets bring the lowest price. Stock reduction also makes pastoralists less able to cope with ensuing droughts. For more on food access issues within pastoral systems, see Holtzman (1982).

geographic area, and ultimately broadens the household's consumption choices (Bromley and Chavas 1989).

The ability to achieve the broad-based gains in household food access associated with structural transformation depends on the costs of exchange (transaction costs) within the economy. These costs are determined by the functioning 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 exchange based on kinship arrangements. The weaknesses of exchange systems in SSA are reflected in the thinness, volatility, and unreliability of markets, the overwhelming predominance of spot markets as opposed to more complex and formalized market structures,[2] the risks of engaging in extensive non-market exchange outside of one's social group, and the failure to develop effective large-scale organizations to take advantage of scale economies (where they exist). These weaknesses restrict rural households' options for acquiring food during transitory food crises, and thus entrench patterns of resource allocation based on self-provisioning of household food requirements, often to the detriment of land and labor productivity. Weak food markets have also given rise to other "traditional" coping strategies during crises.[3] While effective in managing specific types of risks endemic to SSA, traditional coping strategies are largely ineffective in promoting investment, specialization, and productivity growth. These strategies thus reinforce a system of generalized poverty.

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.[4] Where these expected costs exceed the expected gains from exchange, no transaction takes place. High transaction costs therefore prevent what would otherwise be beneficial trades and depress the dynamic development of exchange-based economic systems required for structural transformation.

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[2] Markets can encompass a wide range of pricing mechanisms, including auctions, posted prices, private treaty and futures and options contracts. 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 goods already produced – i.e. they do not involve any sort of forward or contingent contracts.

[3] e.g. selling off assets to buy food, loans or gifts from relatives, temporary migration of family labor in search of wages to buy food (see Platteau 1991).

[4] While it is often implied that markets have a major benefit of producing valuable price information on which to guide resource allocation, this price information is often impacted and costly to collect. Very few markets in the world are auction pricing mechanisms in which price information is available to all present. Most market transactions in SSA are by negotiation (private treaty). When labor, credit, and food are exchanged, the prices struck by buyers and sellers are seldom announced publicly, and other potential participants in the market must expend time and effort to ascertain these past prices as well as collect information to help them predict future prices.

Furthermore, since households vary in the transaction costs they face, the extent of market participation varies across households (de Janvry, Fafchamps, and Sadoulet 1991). Variation in the transaction costs that households incur through exchange greatly influences the extent to which they rely on markets as part of their food-security and income-generating strategies and thus affects who benefits during the structural transformation.

### *2.2.1. Spot Markets*

While specialization and commercialization of agriculture are prerequisites for structural transformation, important micro-level factors impede this process from occurring. The process of transformation that makes higher living standards possible also makes farm households more dependent on the performance of a broader set of exchange systems for inputs, consumer goods, and income. Rural households have little control over these systems. The risk of relying on unstable markets is particularly high for households operating at the margin of survival, where small fluctuations in real income can have disastrous consequences. Many households and firms have responded to the uncertainty and transaction costs of markets by internalizing exchange within highly personalized social or kinship arrangements (e.g. within the village or along ethnic or kinship lines) and through self-sufficiency or subsistence production patterns.

Research from throughout SSA has documented how such high risks and costs associated with participation in markets has 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 1993; Jayne 1994; Tschirley and Weber 1994); use little own capital to finance productive investments (Binswanger and McIntire 1987; von Braun, Malik, and Zeller 1993), and use little hired labor, relying mostly on labor available from the nuclear or extended family (Goetz 1993; Stack and Chopak 1990).

The attempt of rural households to satisfy the bulk of their food, capital, 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 create 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 production and 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. 1993).

Such market performance is consistent with the "efficient but poor" hypothesis of Shultz and others about rural economic systems (Shaffer et al. 1985). Marketing margins may be equal to costs, but these costs are high, and commercial activity is reduced. Efficiency in this context does not necessarily induce specialization, investment and growth. 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 (Tschirley and Weber 1994; Kelly et al. 1993).

### *2.2.2. Personalized Systems of Exchange*

Personalized systems of exchange have persisted largely because of the high costs and risks associated with reliance on thinly traded and unstable markets. These personalized systems often combine exchanges in goods or inputs with contingent insurance contracts that protect vulnerable households against adverse events (Platteau 1991). For example, one land-poor household may provide labor to a related household with more land in exchange for land use and the promise of food in the event of a crisis. Exchange in these personalized systems is limited to members of one's social group, be that the extended family, village neighbors, or the broader kinship group.

While these personalized systems of exchange have been reasonably successful in achieving their insurance objectives, they are poorly designed to achieve the rapid growth in productivity necessary for a transformation out of widespread poverty. Traditional systems of personalized exchange suffer from four crucial limitations which perpetuate chronic vulnerability to food insecurity. First, the social group presents fewer transaction opportunities than would be found in an impersonal market, since the number of participants is small. This limits a household's ability to specialize in line with its resource endowments and specific skills. 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 increases, the number of potential trades within the economy declines exponentially. Consequently, the economy is soon forced back toward autarky (Robison 1987).

Second, members of the social group are typically less geographically dispersed than are the participants in a well functioning impersonal market. The covariance of stochastic cropping outcomes is therefore high among the members of the group, making each more vulnerable to these outcomes.

Third, the success of kinship arrangements in protecting vulnerable households from inadequate access to food has usually depended on the existence of abundant land. The food insurance aspect of these arrangements is being progressively undermined by population growth and land pressure in many regions of SSA (Platteau 1991). As person/land ratios increase, new farming practices will be required even to maintain existing levels of per capita food availability. These new farming practices are likely to involve increased use of purchased inputs, which will in turn require increased commercialization of farm and non-farm activities to finance such farm-level investments. In short, when the carrying capacity of the land is reached or exceeded under existing farming practices, the transition to a more productive system has usually involved an

erosion of traditional kinship-based exchange and the need for viable markets for inputs, credit, and commodities.[5]

The penetration of these markets creates the fourth problem for traditional coping strategies. Markets and complex systems of impersonal non-market exchange evolve over time. As they evolve, they may undermine the traditional risk management strategies which have developed as a substitute for markets (Platteau 1991). The transition from a traditional to a more modern economy thus presents many households with an unenviable choice. If they choose to rely on emerging and still incomplete markets, they suffer from the highly volatile prices, poor information, high transaction costs, and other problems characteristic of these markets. They may also jeopardize their access to the traditional mechanisms on which they previously relied, if market participation interferes with the completion of the social obligations inherent in the traditional mechanisms. If households choose instead to rely on traditional mechanisms, they might find them to be less effective, as impersonal market forces erode the web of reciprocity on which they are based.[6] Thus, in the process of economic modernization, households weigh the gains from trade offered by specialization and impersonal market exchange against the increased risk they face if effective formal risk sharing institutions do not develop as a substitute for the traditional mechanisms (Bromley and Chavas 1989).

### *2.2.3. Internalizing Transactions within the Firm*

An alternative to highly personalized market exchange is internalization of transactions within the firm. When carried out at the extended 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

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[5] In a major review of land tenure systems in SSA, Noronha has concluded that as populations increase and land becomes more scarce, "the circle of individuals who are entitled to access to land diminishes in two respects: membership is more narrowly defined in that, increasingly, only those who can trace actual descent are entitled to land – the stranger being admitted more as a crop sharer or tenant or laborer without any right to land; and the type of land available for allocation to the newly-admitted member becomes increasingly marginal" (Noronha 1985, pp. 182-83). A major implication of this trend for household food access is that rapid population growth induces a gradual erosion of the traditional mechanisms of social security. This results in an upsurge of excluded and vulnerable households, many of whom are recent settlers in an established area and are highly dependent on rural markets, with all their attendant risks and costs, to assure their access to food.

[6] See Lipton's (1985b) description of the "transition of trust."

while avoiding many of the risks inherent in dealing across markets (Lele, Van de Walle, and Gbetibouo 1989; Dioné 1991).

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. 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 indicate that laborers on the cash crop estates are generally worse off than those tilling their own small plots of land (Christiansen and Kidd 1987, Lele 1990). 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.

The few examples of 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 1993; Howard, Chitalu, and Kalonge 1992). 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.

### 2.3. Summary

The escape from poverty requires more than efficient markets.[7] It requires sustained and broad-based increases in productivity. Productivity growth, in turn, requires investment in technological and organizational innovation. Learning, and the knowledge produced by this learning, are central to this process of innovation (Stiglitz 1989).[8] Shaffer et al. (1985) note that

[7] The concept of dynamic efficiency recognizes that the attainment of pareto-efficiency (e.g. the equating of marginal costs and marginal benefits) does not necessarily preclude a situation of mass poverty with very low levels of productivity. Attempts to increase productivity growth (which may involve departing from the principles of static economic efficiency in the short run) may induce very different levels of investment and economic growth than would be obtained by strict adherence to the principles of static economic efficiency.

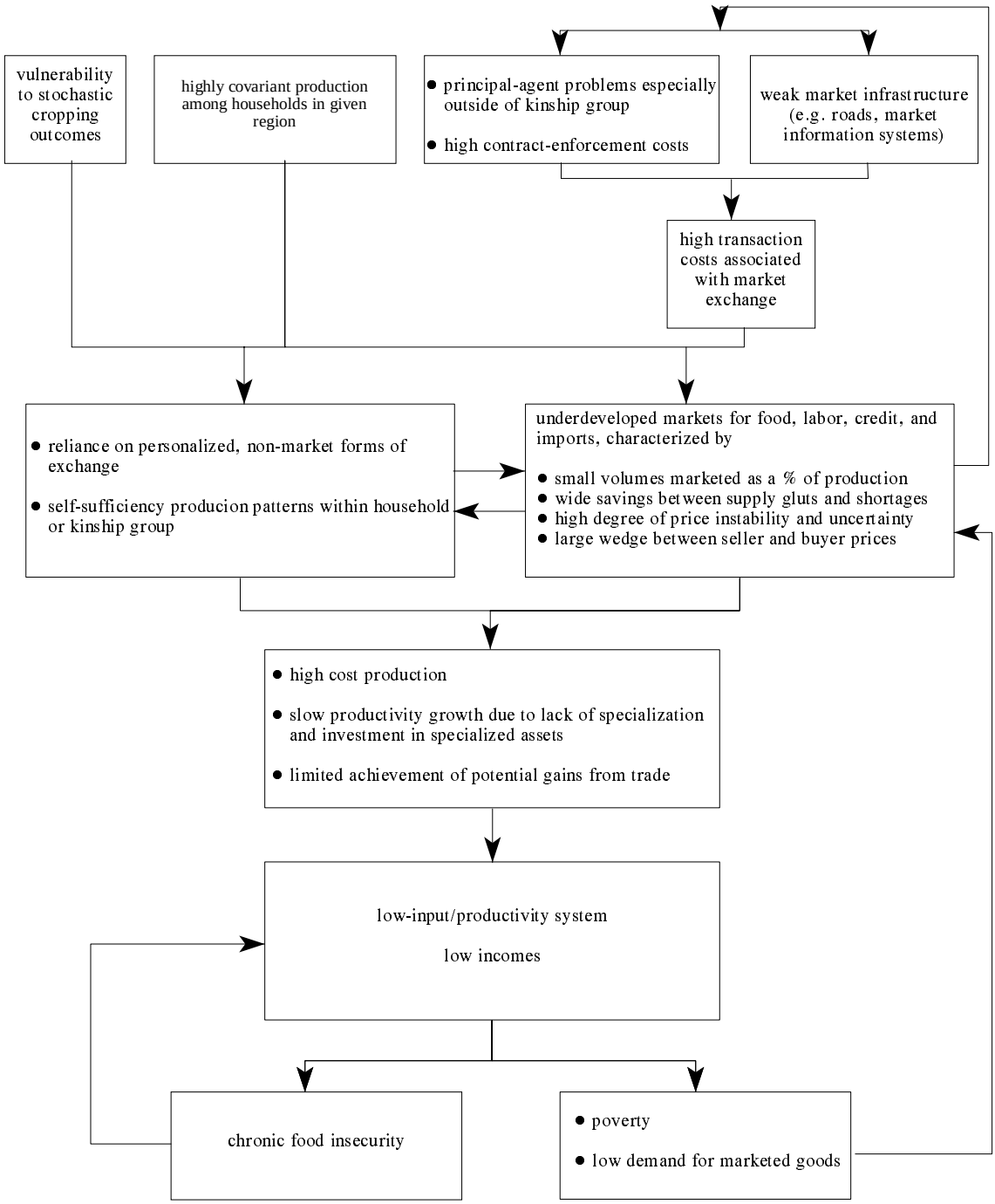
[8] Stiglitz (1989, p. 200) notes that "to a large extent, the problem of development ... is that of the acquisition of information about technology ..."

sustained increases in productivity associated with structural transformation "involve more round-about and complex organization of production and distribution. Coordination becomes increasingly critical to performance" (p. 4). Larger and more complex organizational forms are needed to justify "the expenditures ... to discover more economical ways of accomplishing a task." These tasks include the provision of both public and private goods. Agricultural research and extension is one example of a public good requiring effective coordination within and across complex organizational forms. Efficient processing of food and fiber products into consumer goods with high value-added requires larger and more complex forms of organization. Whether private or public, complex organization requires the coordinated interaction of larger numbers of people than more simple organization, and this requires trust and the free flow of knowledge and information between people not of one's social group.

Rural households in much of SSA are involved in a *n*-participant multi-period game. It is in the interests of everyone – buyers and sellers – to have well-functioning food, labor, financial, and input markets. Yet given prevailing market thinness, uncertainty, and transactions costs, households may find it in their own interests to avoid relying too much on these markets. In response, indigenous exchange systems have evolved that substitute for market transactions. These systems put greater priority on achieving food self-sufficiency on a year-to-year basis, and put less priority on innovations and investments that carry greater risks but have a greater probability of stimulating productivity, income growth, and access to food over the long run.

Figure 1 presents a stylized paradigm of household-level responses to the rural environment and their macro-level consequences. These behavioral responses reinforce the thinness and price volatility of markets. Households' ability to reap potential

**Figure 1. Structural Determinants of Inadequate Household Access to Food**



productivity gains from specialization, cash-crop, and non-farm activities depend on the functioning of rural food, labor, land, and capital markets, but these are hindered by prevailing patterns of resource allocation that treat markets largely as a residual. Investment in other stages of the food system – transport, storage, milling, etc. – are constrained by resulting market thinness.

There are many types of markets; markets may be instituted in a number of different ways; and the "market prices" that determine farm production and distribution decisions will differ, perhaps substantially, depending on the property rights structuring market activity and on the types of public investments made to facilitate development. Therefore, the decision to allow market forces to guide agricultural production decisions is not enough. The question still remains which pattern of market prices and which distribution patterns are desired. Well-functioning spot markets, which implicitly receive the major emphasis in structural adjustment programs, are adequate for transactions involving relatively simple goods. Yet productivity growth has typically involved increasingly specialized investments dedicated to particular production techniques and more complex forms of organization and contracting to handle the increased interdependence and risk that specialization entails.

Increased complexity in the organization of production requires an increasingly complex set of exchange mechanisms to handle future contingencies and risk. In higher-income countries, exchange mechanisms have shifted progressively from spot markets to other mechanisms of exchange such as contracting, vertical integration, use of futures and options markets, marketing orders.

But the viability of these more complex coordination mechanisms in turn requires viable legal systems that raise the costs of contract non-compliance and reduce the risks associated with the actions of trading partners. Markets can work to the public benefit only in the presence of viable rules and enforcement to reduce the costs and risks of investing and transacting in markets. Moreover, because some costs are irreducible, choices must be made about how these costs are to be distributed among various socio-economic groups. These choices affect market outcomes. Getting the "right rules" is inherently a political process, involving determination of whose interests get counted. Shaffer et al. (1985) have pointed out that market outcomes largely reflect prior political decisions that structure the rules of market activity. Failure of collective action to develop the right rules, enforce them once developed, and modify them as priorities and circumstances change, leads to fragmented and poorly-functioning markets. Prior decisions related to the basic distribution of resources have affected income distribution, the pattern of demand, and the way in which markets develop. By making markets work better, one can improve the food security of vulnerable groups. But ultimately, for those markets to work well, the poor will require improved access to resources and technologies that will increase their effective demands for various types of goods and services.

In most high-income countries, this process has entailed some form of structural transformation. Structural transformation entails a movement away from subsistence-oriented household-level production towards an integrated economy based on specialization and more complex, round-

about, and impersonal exchange (Staatz et al. 1994). Such a movement requires the conscious design and continual modification of an institutional set-up which facilitates learning, investment, trade, and growth. This view highlights the importance of "getting the rules right" in order to "get the prices right" (Bromley 1993; Schmid 1992).

This design and continual modification requires a process of governance to (a) discover and articulate a set of rules appropriate to the society's history and present circumstances and (b) enforce the rules once they are defined. Discovering, articulating, and enforcing these rules requires collective action in both public and private spheres (Schmid 1992).

## 3. MARKET-ORIENTED STRATEGIES TO PROMOTE HOUSEHOLD ACCESS TO FOOD: INSIGHTS FROM EXPERIENCE

There is a tendency for many administrators and practitioners to view appropriate responses to transitory food insecurity in terms of non-market based programs, in which food and/or income is transferred administratively, by government or non-governmental organizations, to households meeting certain criteria. This is a natural tendency, as the existing marketing system often fails to provide adequate access to food to many people. However, transitory problems of food access, while set off by drought and other temporary crises, have a number of chronic and structural causes that require structural solutions. Chronic poverty is the major reason why such large numbers of households in SSA are especially vulnerable to temporary crises. While administrative transfer programs will remain an essential component of the mix of strategies to alleviate inadequate access to food, this section underscores the potential for substantial improvements in food access that can come through developing markets so that they work better for the poor and vulnerable, especially during transitory crises.

### 3.1. Market Development Strategies

Much of the literature on food pricing and marketing has stressed the tradeoffs between producer incentives, consumer prices, and government budget costs (Timmer 1986; Pinckney 1988; Buccola and Sukume 1988). However, the interests of both producers and consumers may be simultaneously promoted through policies that reduce food marketing costs. For example, restrictions on the movement of food across district boundaries remain in force in only a few African countries (e.g. South Africa) and were only recently eliminated in Zimbabwe, Kenya, Sudan, Ethiopia, and Mozambique. Research has documented that these regulations depressed prices received by producers and raised prices paid by consumers (Mukumbu 1992; Franzel, Colburn, and Degu 1989; Jayne and Chisvo 1991; Staatz and Dembélé 1993). Jayne and Chisvo found in Zimbabwe that these regulations reduced the real cash incomes of the rural poor by up to 30%. Many of the poorest and most vulnerable consumers of food throughout Africa are in fact rural farmers (Staatz, Dioné, and Dembélé 1989; Jackson and Collier 1988).

However, the reduction of food marketing costs does more than reduce food prices for consumers. More importantly, it may improve production incentives that generate dynamic changes in farm investment, technology adoption, production costs, and cropping patterns that increase real incomes for both rural and urban households. Lower food costs in grain deficit areas release resources for reallocation to other crops or non-farm activities with higher expected payoffs. The Ricardian argument that food costs may be an important determinant of the supply and price of labor, and hence the cost of production in industrial and exportable cash crop sectors, has been empirically supported from recent research in the Sahel (Delgado 1992). The interactions between food costs and the development of viable cash cropping opportunities are discussed further below.

#### *3.1.1. Cash Cropping and Food Access*

Much research from SSA countries indicates that those households that engage in cultivation of cash crops tend to have significantly higher incomes than those that do not (Kennedy and Cogill 1987; von Braun, Kennedy, and Bouis 1990; von Braun, de Haen, and Blanken 1991). The same research generally shows a positive though small effect of this increased income on nutritional status or calorie consumption levels. Other research has shown that, to the extent that food and cash crops require labor or draft inputs at different time, crop diversification may generate a significantly higher value of output for a given bundle of inputs (Goetz 1991). On both the national, regional and household level, there appears to be a positive correlation between food crop and cash crop production, indicating that households and countries tend to experience growth in both sectors or growth in neither (von Braun, Kennedy, and Bouis 1990; Maxwell and Fernando 1989).

The major question is how to induce this transition to a more commercialized and productive system that is capable of generating higher levels of income for rural households and providing the means to obtain food through reliable and efficient markets. Even where significant commercialization has occurred (e.g. in parts of northern Zimbabwe and in areas of cotton production in northern Mozambique and southern Mali), a large portion of smallholders have not taken part in the expansion. These households tend to be smaller and more asset-poor (von Braun, Kennedy, and Bouis 1990; Dioné 1989; Goetz 1991; Jayne 1994; Fafchamps 1992), which might lead one to question the direction of causality between high cash crop production and high farm incomes. Does cash cropping lead to higher incomes, or do wealthier farmers have a greater ability and tendency to engage in cash cropping?

There appears to be at least moderate empirical support for the latter. As stated in section 2, poorly-functioning credit, input, and product markets may prevent asset-poor farmers from being able to exploit the higher returns to available land and labor that increased agricultural commercialization may provide. For farmers that are net staple food buyers, the true opportunity cost of cash-crop production is not the net returns to growing and selling food grains, but rather the cost of acquiring the grain foregone by cultivating cash crops, which is related to acquisition costs of food rather than selling prices (Jayne 1994; de Janvry, Fafchamps, and Sadoulet 1991). Large differences between selling and buying prices may make cash-crop production unprofitable until enough grain is planted for household consumption requirements.[9] The ability to engage in cash cropping may thus depend on household productive assets over and above those needed to meet subsistence grain consumption needs.

This discussion suggests that the reduction of food marketing costs may be a precondition for stimulating broad-based participation in agricultural commercialization and cash cropping, especially among those most vulnerable to food insecurity: low-income farmers with few assets.

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[9] This argument differs fundamentally from those which assert that food price volatility rather than expected returns are what induce risk-averse farmers to strive for food self-sufficiency (see Fafchamps 1992). If food crops provide higher net returns than cash crops, because of high marketing costs between selling and producer prices, then one need not appeal to risk-related factors in favor of food crop production to explain why households grow primarily food.

Once these costs are reduced, profits from cash cropping can become an engine of growth for food production. The relationship between cash and food cropping, then, may best be viewed as complementary but critically mediated by the food marketing system. A low-cost system can spark dynamic changes wherein smallholders become willing to dedicate resources to cash cropping even prior to attaining food self-sufficiency, and the profits from cash cropping allow the adoption of expensive technological packages that increase food production. On the other hand, a high-cost food marketing system may mean that cash cropping never becomes profitable enough, or causes too much risk of food consumption shortfalls, to attract significant smallholder resources.

### *3.1.2. Product Processing and Pricing Issues and the Potential for Self-Targeting*

The case for structural adjustment and food market reform, while widely accepted by donors and international analysts, has not been fully convincing to many African policy makers. Even though numerous African governments have embarked on such reform programs, internal dissent can and often has overturned them and reimposed controls on food prices and trade.

Throughout the reform processes, concerns have arisen regarding the social costs of food market reform, particularly the impact on low-income consumers. Subsidies on some staples have been so high that their elimination has entailed substantial price increases for consumers. A critical problem facing African governments has been how to keep food prices at tolerable levels for poor consumers at a time when production incentives must be increased and subsidies must be eliminated.

In much of eastern and southern Africa, there has been a longstanding perception that urban consumers strongly prefer the relatively expensive refined maize flour produced by large-scale industrial mills over less refined hammer-milled flour and are not responsive to relative price changes between them (Stewart 1977; Bagachwa 1992; Jayne and Rubey 1993; Guyton and Temba 1993). An alternative premise is that, in many countries, maize meal consumption patterns are largely a manifestation of government policy over the decades. While consumption of the more costly sifted flour is partially determined by attributes of the product itself, its perceived popularity may have been exaggerated by decades of controls on maize marketing, which have restricted consumers' access to the less expensive, whole maize meal through informal trading and milling networks, and by large subsidies on sifted meal. In some cases, small hammer mills (producing whole meal) have been blocked by policy from even procuring grain. The perception of strong preferences for sifted meal has been reinforced by substantial advertising by large-scale milling firms portraying refined maize meal as a sign of sophistication and modernity. An implication of the conventional wisdom is that market reforms that eliminated subsidies on refined maize meal would exacerbate food insecurity of low-income consumers without inducing a shift to cheaper maize products.

Ironically, while much research has been devoted to understanding how producers and traders would respond to reform of staple food markets, relatively little is known about the potential

response by consumers. Recent empirical evidence from Kenya, Zimbabwe, Zambia, and Mozambique (Mukumbu and Jayne 1994; Rubey 1993; Jayne and Rubey 1992; Diskin 1994b; Tschirley et al. 1993) highlights seven conclusions with broader implications for targeting vulnerable groups in much of Africa:

1. Consumer preferences can be largely policy-driven. Maize meal consumption patterns in much of eastern and southern Africa appear to largely reflect the influence of food policies affecting the relative convenience and affordability of refined maize meal in relation to whole meal, rather than a strong taste preference for refined meal. For example, less than 20% of 344 urban consumers surveyed in Nairobi in 1993 expressed a strong taste preference for the more expensive refined maize meal. The most important factors affecting consumer choice of maize meal were relative price and procurement convenience, both of which are largely a function of prevailing and historical government policy. Policy regulations that increased time costs for procuring whole meal and increased its price relative to refined maize meal (due to subsidies on the latter) have apparently biased urban maize consumption patterns towards the latter.

2. Consumer subsidies on refined maize meal in Kenya and Zimbabwe have not necessarily promoted food security, because they (and associated controls on maize marketing) have entrenched a relatively high-cost marketing system and impeded the development of lower-cost channels from developing. Regulations or inefficiencies at certain stages of the controlled marketing system may impose redundant costs that overwhelm the effects of direct government subsidies. Findings from both Kenya and Zimbabwe indicate that the subsidy on sifted flour during 1993 was approximately equal to the difference in milling margins between the large-scale roller milling firms and informal hammer mills (Mukumbu and Jayne 1994; Rubey 1993; Sithole, Chisvo, and Jiriyenga 1993).

3. Consumption of whole maize meal in Kenya, Zambia, and Zimbabwe appears to be negatively related to household income, while refined meal is positively related to income (Mukumbu and Jayne 1994; Rubey 1993; Diskin 1994b). These findings indicate that subsidies on sifted flour were captured primarily by high income consumers. These findings also suggest that whole maize meal is to some extent self-targeting, i.e. it would be the product of choice for many low-income households.

4. The time required to process or acquire whole meal appears to be an important factor influencing its consumption, highlighting the importance of convenience and competing demands on household members' time. Survey results for urban households in Nairobi in 1993 indicate that a given household's probability of consuming whole meal is positively related to proximity of the family's home to local hammer mills and negatively associated with households where the woman of the household works in a full time job. The survey evidence suggests that whole meal consumption may be more strongly influenced by policies affecting the time costs of acquisition than policies affecting relative prices of sifted and whole meal.

5. Market reforms that allow consumer preferences to be better articulated through the food distribution system may facilitate (a) improvements in access to food and the nutritional content of food consumed without need for subsidies, (b) productivity gains in the agricultural system through shifts in choice of technique, and (c) growth in employment and income distribution from shifts in volumes through alternative marketing channels and their associated technologies.

6. Small-scale mills have a higher labor-to-investment ratio and labor-to-output ratio than large-scale milling (Mukumbu 1992; Bagachwa 1992; Stewart 1977). Therefore increased small-scale milling would be expected to enhance employment growth and income distribution because of its low start-off capital costs.

7. Perhaps most importantly for future research, we stress the importance of *ex ante* analysis that informs decision makers regarding how preferences may change with policy, instead of implicitly taking preferences as given and formulating food policies around prevailing consumption patterns. When given a wider range of products differentiated by price, consumer choices may be more flexible than supposed by conventional wisdom.[10] Improved knowledge of consumer behavior can widen policy makers' perceptions of feasible options to protect vulnerable groups and increase receptivity to sustaining the recent food policy reforms in Africa. A corollary of this is that policy makers' may feel less compelled to reimpose controls at a later stage.

We conclude that changes in policies affecting food processing technology have been an underemphasized but potentially important means to reduce the cost of staple foods and promote vulnerable groups' access to food through market mechanisms.

Another good with potential self-targeting possibilities is yellow maize. Yellow maize has often been administratively blocked from entering consumer markets in much of eastern and southern Africa, in spite of lower production costs relative to white maize in most of the region. There appears to be an unexploited potential to reduce food prices to lower-income groups by allowing poor consumers the choice to consume yellow maize meal.

Mozambique provides an excellent case study. It is the only country in southern Africa where the retail market has been allowed to operate relatively freely in pricing different types and colors of meals. Research by MSU has identified at least ten different types of maize meals available in retail markets, if one considers both color and processing differences. In addition, three types of grain are sold at retail: yellow from food aid, domestic white and white from Zimbabwe or Swaziland. Since 1990, weekly prices have been gathered on the grains and some of the meals, allowing one to estimate the price premium consumers are willing to pay when allowed to choose freely between different products. Figure 2 shows that consumers shopping in informal markets in Maputo have typically paid a 35% to 38% premium for white grain over

[10] There has already been a rapid increase in the number of registered small-scale mills in Nairobi between 1988 and 1993 under the Cereal Sector Reform Program (Mukumbu 1992).

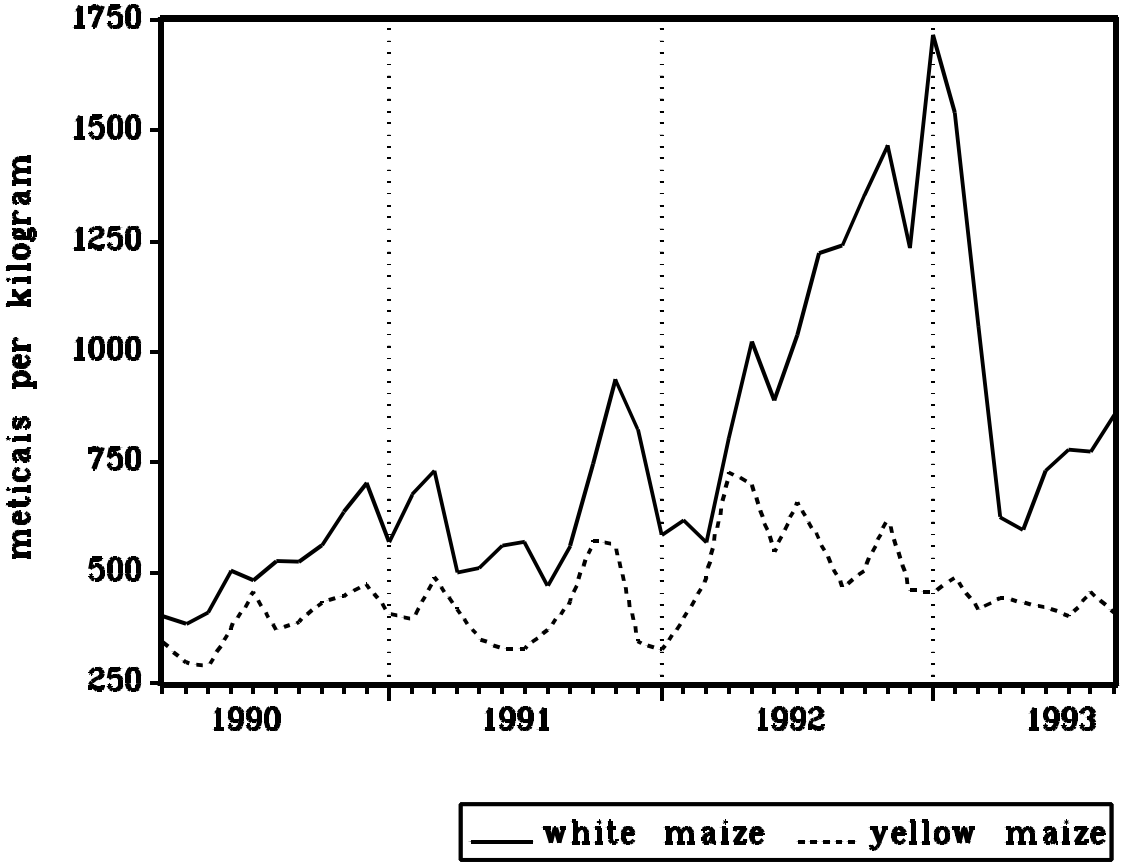
yellow grain.[11] This premium is lower than one might have expected from many statements regarding the strength of preference for white maize.[12]

Price premiums for refined yellow meal (similar in processing to roller meal in Zimbabwe) over unrefined yellow meal were about 30% between 1990 and 1993. At these price relationships, poor consumers strongly prefer yellow, unrefined maize meal. Sahn and Desai (1993) estimate that the poorest 20% of consumers in the capital city, Maputo, allocate 15% of total expenditures to yellow maize grain and meal, and only 3% to white maize. Unrefined yellow maize meal alone comprised 6.6% share of the poorest quintile's expenditures. Within this quintile, only vegetables and fruits have a higher budget share than unrefined yellow maize meal. The upper 20% of income earners allocate only 1.5% of expenditures to yellow grain and meals, and about the same to white maize. Data on relative price movements, market structure, and consumer preferences for white and yellow grain indicate that the two are close substitutes in consumption (Tschirley et al. 1993).

[11] The price difference between white and yellow grain increased dramatically after the effects of the 1992 drought began to be felt. White maize was in such scarce supply that its prices remained very high even as yellow maize prices fluctuated with the arrival of food aid shipments. Prior to the drought, white maize grain prices tracked yellow prices very closely.

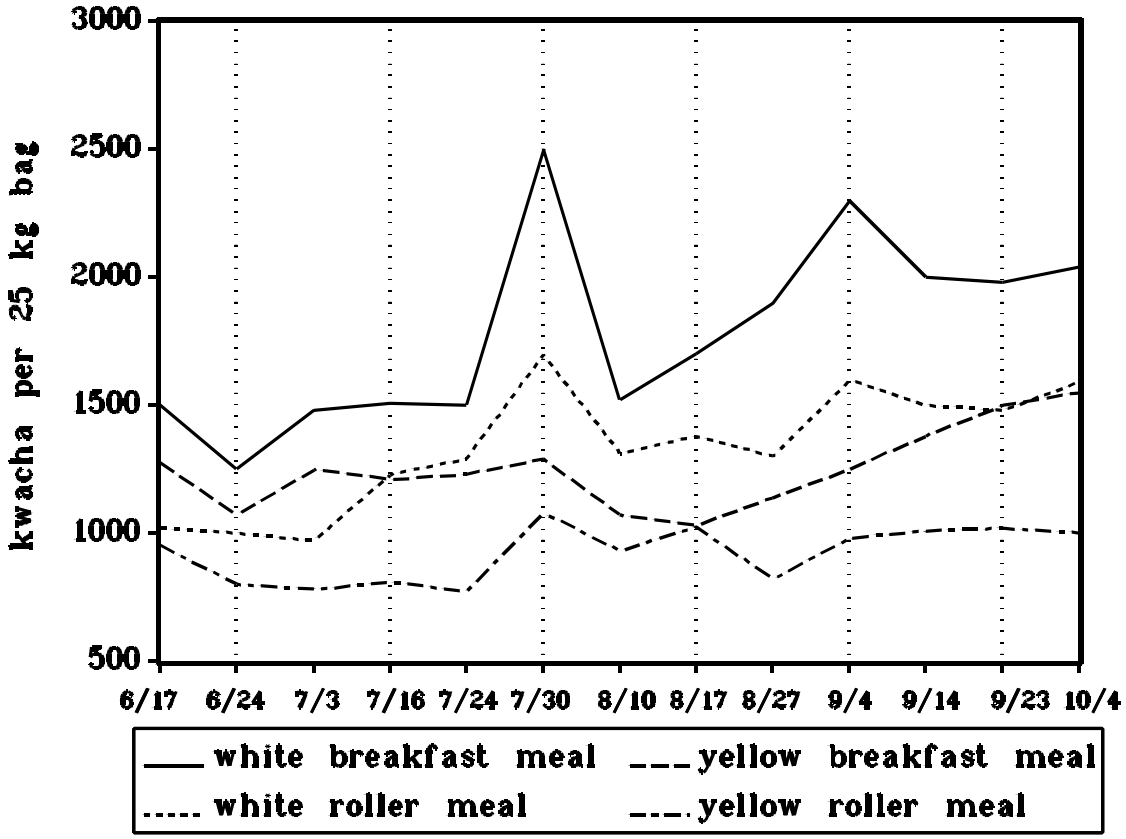
[12] Estimates of the productivity difference between white and yellow grain are about 15%. Thus, the market should be able to support at least that large a price difference between the grains. The actual observed differences in Mozambique have been strongly influenced by administratively determined quantities of yellow maize from food aid and by prices out of Swaziland.

**Figure 2. White and Yellow Maize Grain Prices, Maputo Market, 1990-93**



Limited data from Zambia show that when yellow maize was imported in response to the 1992 drought and injected onto local markets, its price was about 10% to 35% lower than white maize

**Figure 3. White and Yellow Maize Meal Prices, Selected Lusaka Markets, 1992**




for comparably refined meals (figure 3). During this period, yellow maize accounted for about two-thirds of total maize availability in Zambia. The market also priced less refined roller meal about 10% to 30% less than the highly refined breakfast meal, for both yellow and white.

The experience of Mozambique and Zambia suggests that other SSA countries could use the market to target less expensive food to vulnerable groups by allowing consumer preferences to determine the full range of products available and the price differentials between them. Such an approach would contrast markedly with longstanding policies throughout much of southern and eastern Africa that restrict consumers' access to less refined white or yellow maize meal and heavily subsidize the more refined industrially-processed meals.

Allowing the market to determine the demand for yellow maize could also increase the policy options available to government to ensure sufficient maize supplies at stable prices. One of the great disadvantages for countries that depend on white maize is that the world market is very "thin," meaning that only a small proportion of total production is marketed, and thus relatively small changes in market volume have a large effect on prices. Weather-induced changes in import requirements in Southern Africa can markedly affect the world price of white maize and exhaust world supplies, as in 1992. The result is that prices in a given country are largely forced to adjust to domestic production fluctuations. Combined with unstable weather in many of these semi-arid countries, price fluctuations can be extreme.

By contrast, the world market for yellow maize is the largest, in physical volume, of any grain. Over the 1980-92 period, yellow maize prices have been 15% less, on average, than for white maize (Fisher 1993). The yellow maize market is also quite stable. Between 1980 and 1992, the US Gulf price of Number 2 yellow maize has diverged more than 10% from its 1980-92 trend only twice. In addition, yellow maize is always available on the world market. Finally, yellow maize has active futures and options markets that allow countries to reduce the risks associated with grain trading. If governments make the political decision that their constituents will not have access to yellow maize in spite of an apparent niche for it among low-income consumers in some countries, then it is important to recognize that this decision entails relatively higher stock levels and stockholding costs, relatively higher white maize prices, relatively higher import prices in the event of shortfalls, and relatively higher levels of food insecurity.

### *3.1.3. Ensuring a Broad Distribution of the Benefits of Growth*

The foregoing has indicated that improved markets can contribute directly to improved food access through lower food costs, and indirectly through the economic growth that is spurred by more efficient exchange. Yet policy makers and society in general are concerned not only with growth, but also with the distributional effects arising from that growth. Moreover, income distribution and economic growth are functionally linked. Patterns of income distribution affect the structure of demand and growth linkages throughout the economy (Mellor 1976).[13] Access to food may be promoted most sustainably over the long run by an overall policy design that allows broad-based participation in potential growth opportunities.

Donors' development agendas have often grappled with the issue of whether it is better to invest scarce resources in productive agricultural regions where the payoffs are likely to be higher, or in the low-potential areas where food insecurity and poverty are thought to be most severe. While there are many dimensions to this issue, two points deserve emphasis. First, it is not clear

[13] Income distribution and income growth are also linked conceptually because different structures of relative prices resulting from different income distributions create different weights for the various outputs produced. Hence, the measure of what constitutes economic growth will vary depending on the distribution of income.

*ex-ante* that low potential areas have the highest proportion of households vulnerable to food insecurity. To the extent that food markets operate effectively, food security is primarily a function of a household's income, not its food production. If labor markets also function effectively (either locally or for migration), then total income may not be highly correlated with farm production. Indeed, the empirical record in three West African countries shows that food security in low potential areas is at least as great as in higher potential zones. In Senegal, Kelly et al. (1993) show that high potential zones have more households at nutritional risk than low potential zones. In Mali, Staatz et al. (1989) show that, in 1988, there was no significant difference in household food consumption between the low potential North and the higher potential South. The reason for this result was that households in the North had diversified their income sources beyond agriculture and relied more on the market for food supplies. Similar results were found in Burkina Faso by Reardon, Matlon, and Delgado (1988).

The second point is that investments in the more productive areas may produce high payoffs in low-potential regions by developing efficient and reliable market linkages between them. Food supply expansion in productive regions would contribute to lower food costs in the deficit areas if markets function efficiently. These gains would in turn relieve households' overriding concern for food self-sufficiency in the deficit regions, freeing resources for cash crops, livestock, and non-farm activities that give potentially higher returns. In this way, the geographic focus of development-oriented investments does not necessarily correspond to the geographic incidence of beneficiaries. Households in low-potential farming areas may derive greater benefits from productive agricultural investments in high-potential region than unproductive investments in their own region.

However, a broad-based distribution of benefits requires adequately functioning markets. The case of Zimbabwe underscores how productivity gains in productive agricultural regions failed to reach a large portion of the population due to underdeveloped market linkages to grain-deficit areas. Between 1980 and 1985, national maize production doubled and marketed output tripled. Seventy-five percent of these gains occurred in only 18 of the more than 150 smallholder farming areas (Amin 1990). But the increased output did little to increase the accessibility or reduce the cost of maize in grain-deficit areas because of restrictions on the private movement of grain directly from surplus to deficit areas. These restrictions have provided a *de facto* monopoly of maize distribution to deficit areas to four officially sanctioned large and high-cost millers. These restrictions, and the consequent absence of viable intra-rural marketing channels, have actually eroded real incomes and access to food among grain-deficit, relatively poor rural households while simultaneously stimulating the well-publicized growth in aggregate grain sales and income documented elsewhere. Consequently, the marketing system has contributed to the highly skewed distribution of income among the rural population and the apparent paradox of high rural malnutrition amidst national food surpluses (Jayne and Chisvo 1991).

### *3.1.4. Income Diversification and Household Food Access*

Linkages between the farm and non-farm sectors in SSA have been well-documented (Mellor 1976; Haggblade, Hazell, and Brown 1989; Reardon, Delgado, and Matlon 1992). Consumption and production linkages have been shown to be very strong in Asia, where agricultural growth makes significant contributions to the growth of the local non-farm economy. These linkages are not nearly as strong in Africa (Haggblade, Hazell, and Brown 1989), due to lower population densities, the very low level of inputs used on smallholder farms, and the poor development of rural infrastructure and markets in so much of the continent.

Nevertheless, off-farm labor is an important source of income for most African smallholders. This is the case across the continent, but is especially true in areas of low agricultural potential or where agriculture is not thriving for other reasons. Off-farm income as a proportion of total income typically ranges from 30% to 50%, though figures as high as 70% in areas of Mali (Staatz et al. 1989) and as low as 15% in northern Mozambique (Tschirley and Weber 1994) have been documented. Reardon, Delgado, and Matlon (1992) in Burkina Faso showed that off-farm income was positively associated with higher and less variable total incomes. Savadogo, Reardon, and Pietola (1994) show in Burkina that off-farm income has a very positive effect on the adoption of expensive animal traction technology. Thus, it is clear that income diversification can have positive effects on food access by increasing total incomes and, under the proper circumstances, increasing investment in agriculture.

Yet non-farm income may also come at the expense of a more dynamic agriculture. Liedholm and Kilby (1989) identify two income strategies oriented toward diversification in which households are "pushed" rather than "pulled" into non-agricultural activities. This can occur in response to a deteriorating agricultural resource base, in which case smallholders have little choice but to diversify into non-farm activities, sometimes being unproductive and low-paying activities that have low start-up costs but are the only type of jobs available to some people given their resources and skill levels. Diversification can thus be a symptom of low-agricultural productivity rather than a sign of dynamic growth. Yet diversification out of agriculture without reinvestment in farm activities was also taking place in zones with high agricultural potential, but where agricultural technology was stagnant or transport infrastructure and rural markets were poorly developed. Apart from certain remittance income (e.g. mines), non-farm employment and incomes cannot grow without a profitable farm sector that generates a sustainable surplus to fuel demand in the non-agricultural sector. The conclusion is not that non-farm employment growth is a sign of success, but that conditions need to be created whereby agriculture can generate a surplus to encourage the development of productive non-farm activities and employment growth.

### *3.1.5. National Food Self-Sufficiency and Household Food Access*

It is now clear that national food self-sufficiency is a poor proxy for household access to food (von Braun, Kennedy, and Bouis 1990; Staatz, D'Agostino, and Sundberg 1990; Ruppel and Kellogg 1991; Jayne and Rukuni 1993). It is common that 20-30% of the population consumes

less than 80% of caloric requirements even when per capita food supply exceeds 100% of requirements.

Movements toward national food self-sufficiency may promote food access under certain conditions, such as when technological or institutional innovations reduce the cost of food production and marketing, and pass these lower costs on to the consumer. Jabara (1985) has demonstrated that, in Kenya during the early 1980s, improvements in technology and input distribution reduced agricultural prices paid by consumers while maintaining production incentives to producers.

This discussion underscores the importance of productivity improvements in enhancing access to food, through maintaining food production incentives while reducing the real cost of food over the long run (Pinstrup-Andersen 1988). Productivity growth comes from the agricultural system's ability to generate new technology and improve the use of existing technology. This is typically viewed as the mandate of agricultural research and extension. While this is an essential component in the mix of investments to enhance productivity, it is important to view productivity growth from a systems perspective (Reardon et al. 1994). Growth in productivity through new technology or improved input use is seldom achieved without prior innovations and adaptations at other stages of the system (e.g. input or product distribution, processing, etc., see Oehmke and Crawford 1993). Technical innovation and improvements in marketing systems need to be seen as interdependent and complementary processes, with the latter often being a necessary condition for the former. Furthermore, marketing costs typically comprise a greater portion of the consumer price of staple foods than farm-level production costs (Ahmed and Rustagi 1987). Therefore, a 10% reduction in marketing costs may generate greater gains to the consumer, *ceteris paribus,* than a 10% reduction in production costs.

Rukuni and Eicher (1987) have stressed the role of trade and comparative advantage in promoting household access to food, by contrasting food self-reliance and food self-sufficiency. Self-sufficiency involves meeting domestic demand through local production and stockholding, whereas self-reliance involves identifying the least costly way to secure national food requirements through a combination of production, stocks, and trade. Jayne and Rukuni (1993) estimate that Zimbabwe could meet its national maize requirements at 9% lower cost to consumers, on average, through a strategy of food self-reliance, involving moderate amounts of imports, compared to a self-sufficiency policy requiring higher maize prices.

### *3.1.6. Summary*

Research in SSA leads to the following conclusions which are important to consider in designing food policy: (a) the pursuit of self-sufficiency through higher food prices does not necessarily contribute to broad-based rural income growth, especially where a large portion of the rural population are food buyers; (b) a strategy of food self-reliance may satisfy national food needs at lower cost than food self-sufficiency; (c) productivity growth is the key to stimulating growth in food supplies, while promoting access to food by vulnerable groups through the market; and (d)

productivity growth over the long run requires a sustained commitment to agricultural research, extension, the development of input and product markets, and, possibly, a reallocation of productive resources in cases where large portions of the population lack the ability to participate in the potential productivity gains produced by the system.

The appropriate response to transitory problems of inadequate food access generally requires both short- and long-run actions. In the short run, there may be few ways to quickly relieve access problems other than administered food and income transfer programs. There may also be substantial opportunity to protect vulnerable groups through the market if inferior goods (foods consumed primarily by the poor) can be identified.

The ability of the poor to escape from a continual vulnerability to transitory crises require measures to alleviate chronic poverty. This requires a sustained, long-run policy response. Administrative transfer programs will remain an essential component of the mix of strategies to alleviate inadequate access to food, and we discuss some of these approaches below (see also Lundberg and Diskin 1994). But it is important to stress that long-run development of markets, technical innovation, education and the political system are means to alleviate both transitory and chronic forms of inadequate access to food.

## 3.2. Implications for the Design of Sectoral Policies to Improve Access to Food[14]

A major challenge for food security research is to identify macro and sectoral reform policies that enable the majority of the country's population to respond in productive and sustainable ways. This requires greater attention to the initial distribution of assets and resources, which, without change, may provide very little potential for a substantial portion of the population to respond to economic incentives opened up by reform.

Secondly, reform policies would generate a stronger and broader response if they better accounted for the critical linkages between the performance of food markets and related input and commodity markets. We have stressed in section 2 that, since markets are linked across space, time, and commodities, conditions in one market affect performance in connected markets. Improving performance of domestic grain markets, for example, may require addressing problems in connected markets.

### *3.2.1. Linkages across Countries*

Market reforms implemented in Africa in recent years 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

[14] This section draws from Staatz et al. 1993.

countries. Consequently, trade flows across borders were frequently driven more by rents generated by divergent national policies than by underlying comparative advantage (Barry, Stryker, and Salinger 1991; Coste 1989; Kingsbury 1989).

### *3.2.2. 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 (1991), 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.

### *3.2.3. 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 within a single contract. Goetz contends that failures in land markets in Senegal have taken away a major source of collateral, making access to credit difficult. As a result, credit-constrained families obtain inputs for cash cropping (such as peanut seed) and access to food by agreeing to labor on the larger farms. Through this form of personalized exchange, the scarcity of cash-crop inputs may lead to lower food production (Goetz 1993). 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.

### *3.2.4. Linkages between the Markets for Cash Crops and Food Crops*

It has often been assumed that production of cash crops for export results in foregone food crop production. More recent research has indicated important synergies between the two (von Braun, Kennedy, and Bouis 1990; Dioné 1989; Dioné 1991; Jayne 1994). 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 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 and other purchased inputs 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 drove a large wedge between the selling and acquisition price of grain, even within a given location. 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.

### *3.2.5. 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 Côte 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 1989). 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.

#### *3.2.6. 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 the Government of Rwanda's decision to not implement an intended support price policy for beans after research results indicated that most Rwandan farmers were net bean buyers and that much of the local bean supply was imported informally from neighboring countries (Loveridge 1991). The generation of demand-driven policy analysis has been illustrated in Zimbabwe by President Mugabe's recent call for analysis on how to expand the role of small-scale maize mills, largely in response to applied research within the government and at the University of Zimbabwe.

### 3.3. How Can Price Stabilization Be Designed Most Cost Effectively to Enhance Access to Food and Stabilize Food Consumption?

In most countries of SSA, grain-based meals make up a very large part of the diet. Demand is generally inelastic. changes in supplies result in proportionally larger changes in prices.

Declines in supplies and related price surges fall disproportionately on the poor.[15] To avoid pricing the poor out of food markets, private traders or the government must be able to release food onto the market from either stocks or imports. Most studies of private trade indicate an underprovision of inter-year storage because of high risks and market failures.[16] In some cases, these risks have been exacerbated by government behavior (Sahn and Delgado 1987; Steffen 1993). Some evidence indicates that private traders rightfully question whether government officials would really allow them to profit from high prices in drought years. Government statements frequently indicate that it is socially unacceptable to permit such perceived "profiteering," even if such profits are necessary to induce commercial storage.

Even without the threat of government price stabilization, it is safe to say that the amount of inter-annual arbitrage that would take place under private grain trading would still generate a level of price instability that is unacceptably high to many African governments, especially those in landlocked countries where the gap between import and export parity is large. In cases where the policy process, for better or worse, has resulted in a decision to stabilize food prices, research can help inform governments about means to protect households' access to food at least cost and without hampering the development of private trade.[17]

### *3.3.1. Should Stabilization Be Based on Stockholding or Trade?*

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[15] For example, if 80% of the population can afford to maintain its normal consumption levels during a drought that causes a 5% decline in national availability, then the remaining 20% of the population would incur a 25% reduction in their consumption. If the poorest 20% were consuming relatively less per capita than the rest of the population to begin with, then the above scenario would precipitate a decline in the poor's consumption by even more than 25%.

[16] See Lele 1971; Goldman 1974; Ejiga 1977; Southworth, Jones, and Pearson 1979; and Sahn and Delgado 1987. The risks and costs of inter-annual stockholding are largely due to uncertainty regarding next season's production outcome and how farmers react to it. For example, uncertainty about the future harvest creates incentives for farmers to store grain for consumption the next year, selling the residual only when confident that the harvest will be good enough to satisfy next year's requirements. The aggregate consequences of many small farmers selling off stocks due to anticipation of an abundant harvest is often depressed prices before harvest and throughout the next year, increasing the riskiness of both intra-annual and inter-annual storage. Such occurrences may help explain the seemingly high profits of grain speculators relative to storage costs in normal years. High risk premiums may be necessary to compensate for the high incidence of loss incurred by traders engaging in temporal arbitrage. But risk premiums are a form of deadweight loss – they create additional costs from which there is no return.

Failures in financial markets also contribute to an underprovision and concentration of inter-annual storage by the private sector. This is because credit shortages tend to restrict long-term storage to large traders with the ability to finance inventories with own capital and bear substantial risk (Sahn and Delgado 1987; Mehta 1989).

[17] The issue of whether price stabilization enhances welfare continues to be controversial. While it is not our purpose to review this literature, interested readers are referred to Newbery and Stiglitz 1981, Timmer 1989, Myers and Oehmke 1987, and Kangasniemi et al. 1993.

Based on analyses of Kenya (Pinckney 1988), Pakistan (Pinckney and Valdes 1988), Malawi (Pinckney 1990), and Zimbabwe (Buccola and Sukume 1988), it has been generally concluded that governments can normally stabilize food prices within a given range at lower cost by relying more on trade than stockholding. These results have important implications for household access to food insofar as the costs incurred in procuring a given supply of food (whether it be from domestic production, stock releases, or imports) are passed on to consumers.

There are several important criteria for designing price stabilization programs that promote household access to food at least cost. These include the following:

*(1) import requirements during a drought relative to the size of the world market for that commodity:* The case for reliance on world markets rather than stockholding is stronger for countries that are small players on world markets, i.e. their import decisions are not significant enough to affect world market prices. Demand for wheat in Senegal would be an example. On the other hand, some staple food commodities, such as white maize in Kenya, Mozambique, Zambia, Zimbabwe, and South Africa, are thinly traded on world markets. If these countries needed to import white maize at the same time, as in 1992, they could bid up the world price and exhaust available world supplies. The rationale for some level of stockholding is compelling in such cases (Pearson 1992; Pinckney 1993).

*(2) the covariance between production in the country and neighboring countries:* When countries within a region experience shortfalls at the same time, import costs rise because (i) supplies must be procured from more distant sources, (ii) demand for local port and transport services rises, and (iii) world prices may be affected by joint import decisions (Kingsbury 1989). If inland neighboring countries have similar weather patterns and often experience drought at the same time, private traders are seldom able to import sufficient food from neighboring countries to avert large and politically dangerous price increases. This is especially the case for regions facing large transport costs to coastal ports. Other things equal, this would strengthen the argument for some form of stockholding policy from the standpoint of both food security and political stability.

*(3) whether there are close substitutes in consumption:* Fluctuations in supplies and prices in one market can be partially absorbed by other markets, if the commodities are close substitutes in consumption, and if world prices in the various markets are not closely correlated. For example, the rapid rise in wheat and rice consumption in urban African cities has probably moderated the variability of coarse grain prices. In such cases, the importation of one commodity can help stabilize prices of other food commodities, even those that are thinly traded on world markets. However, consumption of one primary staple food is more common in many rural areas of Africa. If governments are dedicated to assuring the availability of these foods in rural areas during production shortfalls, some form of stockholding scheme is probably necessary.

*(4) the relationship between import and export parity prices and domestic price levels under a range of supply and demand conditions:* Other things equal, a larger gap between import

and export parity would reduce the amount of price stabilization obtainable from trade. If this price band is deemed excessive, then some form of stockholding would be required to reduce price instability.

Stockholding of domestic production becomes relatively less costly than imports, ceteris paribus, as expected domestic prices decrease to export parity levels. Imports become relatively cheaper than stockholding as expected domestic prices increase toward import parity levels.

*(5) the likelihood that price stabilization would actually help stabilize farmers' real incomes and food consumption depends on the proportion of the rural population that are net food buyers:* It is often asserted that price stabilization actually destabilizes farm income because price does not vary with quantity supplied. By contrast, private traders, with negatively sloped demand curves, are asserted to stabilize farm income when the source of instability is weather-induced changes in supply. In this case, changes in prices are offset by countervailing changes in quantity sold.

This argument is associated with a counterfactual assumption that rural farm households are largely food self-sufficient. While an inverse relationship between prices and quantities marketed may promote the stabilization of aggregate farm income compared to price stabilization, this result clearly is not true for farm households that are either chronic food purchasers in both normal and poor rainfall years, or for those that are food self-sufficient in normal years but become transitory food buyers in bad years. For both of these types of households, real incomes are depressed by declines in farm output and higher grain prices. These households are particularly vulnerable to food insecurity where non-farm incomes are not sufficient in drought years to procure higher-than-normal purchased food requirements.

Therefore, stabilization policy needs to address the twin problems of providing commercial-oriented farmers with reliable net revenue expectations to promote low-cost production without subsidies, and providing reliable and low-cost food to rural and urban food purchasers.

### *3.3.2. Price Stabilization and Household Access to Food*

Until recently, much of the work on food price stabilization focused on the effects on commodity markets (Waugh 1944; Oi 1961; Massell 1969). This work tended to ignore the important effects of commodity market performance on the performance of land, labor, and financial markets, which are crucial to improving the predictability and stability of rural food markets. It has become increasingly apparent that the instability of food prices and availability in much of SSA has increased the transaction costs and risks of participating in input and factor markets (Goetz 1993; Platteau 1991; de Janvry, Fafchamps, and Sadoulet 1991). This situation increases the risks and costs of participating in food markets, and reinforces the indigenous arrangements that tie food exchanges (often contingent on cropping outcomes) with exchanges in labor, land, or credit within a single "contract" (Goetz 1993). As mentioned above, the

literature on indigenous exchange systems has generally concluded that these systems are quite effective in assuring equitable allocation of available (but often inadequate) food supplies during crises, but they seldom provide either the means or the incentives to stimulate growth in food production or meet the needs of the group when there is an aggregate shortfall. Therefore, stabilization of food prices and availability may have more system-wide and indirect effects on food access in particular, and welfare in general, than previously thought (Timmer 1989; de Janvry, Fafchamps, and Sadoulet 1991).

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 predictability and reliability 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. 1993). Because of market uncertainty, farmers' liquidity constraints, and other factors, grain often flows out of rural areas to urban markets immediately after harvest, and has to be shipped back to the areas in the pre-harvest hungry period. The additional transport costs involved thus inflate prices later in the year and exaggerate intra-year price fluctuations.

The simulations were 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 1989).

### *3.3.3. Summary*

Several conclusions can be drawn regarding price instability and household access to food from applied research over the past decade. First, the ability to shift from semi-subsistence to commercialized agriculture is facilitated by reliable and low-cost food markets that allow farmers to diversify into high-valued cash crops without jeopardizing their access to food (Shaffer et al. 1985; Jayne 1994; de Janvry, Fafchamps, and Sadoulet 1991; Goetz 1993).

Second, it is seldom feasible or desirable to eliminate price variability. While the reduction of seasonal price fluctuations may improve access to food by those dependent on selling early and buying late in the season, efforts to eliminate seasonal price fluctuations, (e.g. pan-seasonal pricing policies) have normally shifted the full burden of seasonal storage onto the marketing

board, typically imposing on it costs that are beyond its capacity to handle, with the result that the system breaks down or becomes a means to shift income to particular social groups, most often not the poor. This type of system has often generated more price unpredictability than without any form of direct intervention. Some state trading agencies *have* effectively restrained large price surges during drought years (e.g. Zimbabwe's Grain Marketing Board and South Africa's Maize Board), which has certainly promoted access to food among low-income urban consumers and rural farm households that are food purchasers. Evidence also suggests that stable access to food at predictable prices reflecting costs of production may improve the functioning of inter-linked labor, financial, input, and commodity markets, thus indirectly improving household access to food (Goetz 1993; de Janvry, Fafchamps, and Sadoulet 1991; Jayne 1994; Tschirley and Weber 1994). However, the benefits of direct price stabilization programs compared to their costs remain controversial.

Third, the unpredictable fluctuations in seasonal and inter-year food prices may also be reduced by public investments in road and communication infrastructure, and by incentives to expand private investments in storage and transport. These strategies *may* be more cost-effective than direct government price stabilization programs, and they represent potential uses of donors' long-run development assistance that would also improve countries' abilities to respond to short-term food crises.

Finally, the effect of price stabilization programs on household access to food depend critically on how they are designed and implemented. Normally, the cost of governments' price stabilization functions are at least partially passed on to consumers. Access to food is therefore best protected by programs that identify the least-costly combination of stockholding and trade policy to secure needed food during production shortfalls. The importance of trade and stockholding depends on a number of factors, including (1) commodity import requirements during drought years relative to the size of the world market, (2) the covariance between production in the relevant country and its neighbors, (3) whether there are close substitutes in consumption for the commodity in question, and (4) the difference between import and export parity prices, and (5) the difference between domestic prices and import/export parity prices under a range of supply and demand conditions.

This is not a case for no-government participation in programs to assure adequate food supplies and their distribution. Access to food for all members of society under unusual circumstances has public good characteristics and will not always occur at the level preferred by society without government participation.

### 3.4. How Can Food and Income Transfer Schemes Be Designed to Protect Vulnerable Groups' Access to Food without Hampering the Development of Markets over the Longer Run?

A primary criterion for the design of food transfer programs is to not undermine the development of markets, since well functioning markets are critical to income growth and access

to food over the long run. Some forms of disaster relief altered the current payoffs and future incentives for participants in the food system, reducing the effectiveness of the system both in the short and long run.

In most countries of SSA, food aid is distributed through two distinct channels. Food aid for emergency programs ("emergency food aid") is distributed free of charge, either by direct distribution or in food-for-work programs. The distribution is generally carried out by a government disaster assistance agency, or by non-governmental organizations (NGOs), or by some combination of the two. This food aid may be purchased from surpluses within the country, or regionally, or on world markets, and may be provided under bilateral or multilateral arrangements (the World Food Program being the principal multilateral program). This aid may go to refugees of war (as in Mozambique) or to populations deemed by government or donors to have been especially affected by transitory crises, such as the 1991/92 drought in southern Africa. In either case, final consumers do not have to buy the food.

Like emergency food aid, "program food aid" is donated to the recipient country, but it is then sold, or "monetized."[18] The grain may be sold to a government parastatal and distributed through government ration shops at official consumer prices (as in Mozambique until 1992), or it can be sold directly to private sector traders or millers (in the case of food grains). These in turn may either sell into the open market at market prices (as in Mozambique since 1992), or at official prices (as in Zimbabwe during the drought). In either case, revenue from the first sale of the product (termed "counterpart funds") is deposited in a special account and used for developmental purposes.

*Monetization*

Monetization is often seen as one way to reconcile the potential conflict between the short-run objectives of food aid and the long-run development objectives of the country. Selling the food rather than distributing it free of charge is thought to support the development of markets and avoid some of the disincentive effects that may accompany free distribution. However, whether monetization in fact relieves this conflict in any given country depends on many details of the program food aid program in that country. Both monetized (program) and free (emergency) food aid in the form of yellow maize were used extensively in Zambia, Zimbabwe, and Mozambique during the 1992 drought. This experience has provided several important lessons for the future design of food aid programs.

[18] Some emergency food aid is typically sold to pay for the transport and administrative costs of handling the rest of it.

In Mozambique, the drought led to a significant increase in what was already a very large flow of emergency and program aid to the country.[19] As alluded to earlier, by the time the effects of the drought were felt, program food aid was being sold directly to private traders at prices agreed upon by the Government of Mozambique and donors. These traders then sold the grain into a very competitive informal marketing system at whatever price the market would support. Emergency aid was channeled primarily through NGOs, though the government disaster assistance agency continued to distribute grain directly.

Prior to the drought, both white and yellow maize prices were highly volatile and were strongly influenced by the timing and size of yellow maize program food aid arrivals. When relatively small amounts arrived frequently, prices showed relative stability. When shipments became larger but less frequent (as between mid-1991 and mid-1992), price movements became extreme.

Increased shipments of emergency and program food aid in response to the drought were only slightly delayed. Yet once the flow began, it simply overwhelmed the capacity of the country to absorb it. The effects on markets have been dramatic and may take some time to rectify.

With a near-total white maize crop failure and no program food aid arrivals since January 1992, prices of both white and yellow maize in the capital city of Maputo reached very high levels by May 1992 (when the country would normally be in the midst of its white maize harvest). Yellow maize prices then fell with the arrival of a program yellow maize shipment. Another arrival in late July cut off a second price surge. By the end of 1992, yellow maize prices in Maputo had reached historically low levels in real terms, all as a result of program food aid arrivals. Large emergency program arrivals in response to the drought did not begin until December 1992. From this time through the end of 1993, leakage of large proportions of this emergency grain onto the market continued to drive prices down, until they reached only half the level of previous lows in real terms. This despite the complete absence of program food aid arrivals from February through November. As a result, private traders who had been first buyers of the program food aid could sell their grain only at steep losses. Grain accumulated in trader and port warehouses, and thousands of tons spoiled and had to be disposed of.

Producers of white maize were also hurt by the oversupply. In the midst of the 1993 white maize harvest, yellow maize from food aid sold at retail in production areas for as little as 160 MT/kg (US$40 per ton). The glut of imported yellow maize has depressed demand for locally produced white maize and has made irrelevant the government's mandated minimum producer price for white maize of 425 MT/kg (US$106 per ton). In the central region of the country, farmers were selling white maize for 200 MT/kg ($50 per ton), and still could not sell all of their surplus. As a result, very little white maize came onto the Maputo market in 1993, despite what appears to have been a relatively normal harvest.

[19] For a detailed analysis of the food aid program in Mozambique, with emphasis on monetized food aid, see Tschirley et al. 1993; and Tschirley, Donovan, and Weber 1994.

Several conclusions may be drawn from the Mozambican experience. First, under the existing system, prices within the country must adjust to whatever administratively determined quantities of program food aid happen to arrive. Thus, simply monetizing the food aid, while often a step in the right direction, may disrupt food markets and/or provide huge rents to first buyers if the behavior of food markets are not adequately taken into account. When demand exceeds supply at the price at which the food aid is to be monetized, those who are chosen to be first recipients earn large economic rents, passing little or none of the low price on to consumers. When quantities exceed demand at the fixed price, serious problems of grain maintenance and disposal develop. Perhaps inevitably, pressures build to reduce the price to the first buyer. While facilitating the disposal of excess grain, this accentuates the downward pressure on prices, and may severely affect traders at other levels of the system who have purchased grain based on the previous (higher) sales price to first buyers. Food aid can thus become a highly destabilizing influence on the market, even if monetized. If these effects are to be avoided, some mechanism must be developed to introduce feedback from market prices to quantities of food aid arriving in the country.

Second, market prices can be useful for managing the distribution of emergency food aid. Unusually low prices in an area receiving emergency aid may indicate several problems, each of which would require a different response. One possibility is that large amounts of emergency aid are being diverted onto the market prior to reaching the intended recipients. In such a case, the fundamental problem is distributional, i.e. how to get the aid to those who need it. The amounts of aid may or may not be excessive. Second, the target population may be receiving the product, but the aid may be largely displacing grain purchases that these households would otherwise have made on the market, thus reducing demand and driving prices down. In such a situation, donors need to be very sensitive to the negative effects that the emergency aid may be having on the market. Finally, recipients may be selling some or all of their quotas on the market. In this case, too, emergency distribution may destabilize the market.

Third, concerted efforts by donors to coordinate their food aid activities would assure minimal disruption of markets and increase the cost-effectiveness of the aid disbursed. In Mozambique during the 1992/93 drought, literally no one among any of the donors knew the total amount of grain that had arrived or was scheduled to arrive. Traders receiving program aid were almost entirely unaware of how much emergency grain was being shipped, and where and when it was to be distributed. Planning under such circumstances becomes impossible, and negative outcomes for the marketing system become much more likely.

Finally, private traders acting as first buyers of the program food aid can provide critical information to food aid planners in terms of market conditions and how the monetization of given quantities will affect price levels.

The 1992 experience with monetization in Zimbabwe also clearly indicates that the ability of food aid to enhance the long-run development of markets can be lost if inadequate attention is given to the organization of the existing grain marketing system. Zimbabwe's Grain Marketing Board was, at that time, largely a de facto procurement agency for four large milling firms that

subsequently distributed maize meal to urban and rural consumers. The donors, by agreeing to channel almost all monetized maize through the Grain Marketing Board, helped concentrate most of the marketed maize in the country into the hands of the four large millers. Private small-scale traders and millers were prevented from buying more than a small fraction of the monetized maize due to formal and informal restrictions on the resale of GBM maize. However, milling costs of small-scale millers are substantially lower than margins received by the four large firms, so that the monetization of donor maize through the GMB/large-scale milling system imposed unnecessary costs on consumers that partially negated the benefit to consumers from the government subsidy on maize meal. MLAWD (1993) estimates that about 37% of the government's expenditure on maize meal subsidies intended to protect consumers during 1992 was actually captured by four milling firms. Furthermore, the monetization and subsidization of maize through the GMB/large-scale milling system suppressed the growth of small-scale trading networks that were to be the cornerstone of the donor-supported Grain Market Reform Program, designed to stimulate competition in grain marketing.

Both the Mozambican and Zimbabwean experiences highlight the importance of the grain marketing system in determining the appropriate design of food transfer and monetization programs. Efforts to use disaster relief in ways that promote long-run development would be more effective if these efforts were part of a broader strategy to foster more competitive, integrated, and lower cost marketing channels.

# 4. IMPLICATIONS FOR THE DESIGN OF POLICIES AND PROGRAMS TO PROMOTE HOUSEHOLD ACCESS TO FOOD

## 4.1. Structural Transformation and Access to Food

The main premise of this report is that sustained improvements in household access to food in SSA require the development of more reliable food and input markets that (a) create incentives to adopt cost-reducing investments at various stages in the food system and (b) offer incentives for rural households to shift from a subsistence-oriented pattern of production and consumption to more productive systems based on specialization and gains from exchange. While disaster relief operations will continue to be necessary in many regions of SSA, the development of more productive food systems can both improve food security and reduce dependence on food donations. The hypothesized chain of causality is as follows:

(1) Most countries of SSA have a large proportion of their populations living at near-subsistence levels with little savings to cope with the frequent disruptions in production.

(2) Sustained improvements in access to food over the long run require some form of structural transformation that, in the historical development processes of other regions, has been a prerequisite for broad-based and sustained growth in productivity, real incomes, and purchasing power throughout society.

(3) A structural transformation involves a movement away from subsistence-oriented, household-level production toward an integrated economy based on specialization and exchange. But specialization makes households dependent on the performance of exchange systems. The ability to capture the productivity gains from specialization thus depends on reducing the risks and uncertainty of market-based exchange, thereby facilitating greater participation in the types of specialized production and consumption patterns involved in the process of structural transformation.

In Africa, a spate of food market reform programs have been implemented during the 1980s and 1990s. In many cases, these policy reforms have promoted access to food by reducing marketing costs and making a wider range of staple foods available to consumers. Some of these products, e.g. less-refined grain flour, appear to be preferred by the poor considering their lower costs. They are also nutritionally superior to the more refined staple products. Increased availability of these less-costly staples under market reform has partially, and in some cases fully, offset the effects of removing large government subsidies on foods distributed through official marketing channels.

However, market reform has not always led to market development. 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, more importantly, to set the conditions necessary to induce a structural transformation. Effective exchange systems require a set of rules, enforcement agencies, and collective action to provide important public goods and critical inputs which 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. But the solution involves efforts to identify the major constraints impeding food access and productivity growth and then to put effective forms of collective action in place to mediate between the various interests and induce changes to overcome these constraints. This approach is in contrast to the assumption that market-determined outcomes will inherently result in the highest level of social welfare. The outcomes of all market processes vary according to the rules and institutions that circumscribe market activity. 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 importing technical inputs, including technical and organizational knowledge and attracting investment. A major barrier to trade is high transactions costs. Transactions costs and investments are greatly influenced by the regulatory environment and the existence and efficiency of related markets. The problem is that to achieve economies of scale and compete in international markets, relatively large organizations are required. Given the very thin markets in most African countries, creating or importing such large organizations (such as the CMDT in Mali) often results in monopoly or, at best, in 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.

We have argued that the structural transformation requires effective markets for the production and distribution of agricultural products, processed foods, farm inputs, and consumer goods.

Work must move from semi-subsistence production patterns on farms to specialized firms providing productivity-enhancing 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. This transformation will not happen without the facilitating functions of government.

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.

In the case of SSA, we believe the international community has an important role to play. 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. New international institutions are needed to promote private investment and knowledge transfer. In this respect we believe the lessons from the cotton subsector in Francophone West Africa is particularly instructive.

### 4.2. Promoting Complementarity between Disaster Relief and Development Assistance

Because structural transformation occurs over the course of decades, broad-based and enduring improvements in access to food in most of SSA require a long-run time-frame. However, setting the process in motion requires strategic actions in the short run. Selected market reforms and public investments as discussed in section 3 have helped to stimulate the process in some countries. Furthermore, a healthy and skilled labor force is critical to the process of structural transformation. Hence, despite the long-run solution to the food access problem, short-run targeting actions will continue to be critical during food crises to protect the health, well-being, and future productivity of society. On-going field research provides some guidelines concerning how disaster relief can be designed to improve the long-run functioning of markets, and how longer-run development assistance can be designed to better enable vulnerable households to cope during food shortfalls:

(1.) *Focus on achieving productivity gains in the food system.* Government and donor disaster relief programs to protect vulnerable groups' access to food during transitory crises will be more successful and less costly when combined with strategies to alleviate the chronic causes of poverty. This requires a focus on achieving productivity gains in the food

system that increase incomes and reduce the real costs of food over time. The scale of vulnerability to drought and other transitory crises in Africa is primarily due to structural causes of poverty related to low-productivity agricultural systems. Since poverty is the major underlying cause of food access problems, measures to increase real incomes and reduce food costs are crucial, and both of these are achieved mainly through productivity growth.

(2.) *Focus on how food and income transfer programs can be designed to promote the long-run development of the food system – the basis for providing food for most people over the long run – as well as providing food to people in the short run.* We have provided examples of how program food aid (monetized) can both help and hinder the development of competitive markets. Public works programs, while not the focus of this report, are another strategy designed to promote both longer-run development objectives as well as emergency feeding (see Webb, von Braun, and Yohannes 1992).

Use of disaster relief to promote access to food in the short-run without disrupting the performance of food markets over the long run would be facilitated by (a) encouraging governments and donors to invest in local analytical capabilities to better understand the behavior of the food system into which food aid is injected; (b) encouraging donors to liaise and coordinate food transfer activities; (c) soliciting information from an array of private traders and other participants in the food system; and (d) working with government agencies, trade associations, and other non-state organizations to invest in critical public goods, such as market information systems, communication networks, a process for establishing legal foundations of markets, and contract enforcement capabilities.

(3.) *Focus on reducing the costs of food marketing by expanding the range of products available to produce and consume*. Accurate knowledge of consumer behavior (e.g. knowledge of demand for products currently not in the market) is critical to guide market development programs to improve household access to food, particularly for low-income consumers. Existing consumption patterns may be largely policy-driven, and in some cases may obscure policy makers' perceptions of how market reform would affect urban consumers, a politically sensitive group. More accurate knowledge of how consumer choices would respond to the availability of a broader range of products, and how market development might affect product availability and price, may raise policy makers' receptiveness to undertaking food market reform programs.

Market restructuring can also increase food system productivity by affecting farmer incentives to adopt new farm-level technologies and by inducing use of more appropriate technology in processing and marketing.

Finally, consumer subsidies do not necessarily promote food security if the subsidies entrench a relatively high-cost food system and prevent lower-costs alternative channels from developing. We have provided several examples of how untargeted subsidies on

some refined staple products have had regressive distributional effects, and have hampered the development of a more productive and employment-intensive system from evolving.

(4.) *Focus on the cost and reliability of food supplies to rural areas as a component of non-farm, livestock, and other income diversification strategies designed to promote access to food over the longer run.* It is difficult to exploit cash crop/non-farm employment and income opportunities when food markets cannot assure a reliable supply of food to buy in rural areas and when the costs of making food available in rural areas are so high that other activities become unviable. Poorly designed export promotion programs can exacerbate food insecurity.

We also stress the need to incorporate long-term human capacity building into donor assistance programs designed to promote food security and agricultural development. To a large extent, research, capacity building, and policy dissemination are joint products. Given that there are typically entrenched local interests in maintaining status quo policies, mobilization of support for socially useful policy change is most effectively driven by local analysis and dissemination of findings. Donor pressure, while often useful and effective, can also be branded as interference and be used to direct public opinion against socially useful reform. Local analytical units often have greater acceptance and credibility and can serve to make the effects of policy reform more transparent to policy makers and the public at large. Therefore, donor programs to promote food security through agricultural policy change can be more effective when built on a foundation of empirically based analyses generated by strong local analytical units. Donor programs can be designed to jointly produce research, capacity building, and policy-relevant extension work.

Moreover, support for local analytical capacity increases the effectiveness of donor-driven policy analysis (e.g. non-project assistance, sector studies, etc.). It is clear that short-term expatriate consultants obtain most of their information and insights from existing in-country analysts and reports. Therefore, the strength of existing in-country analytical units often indirectly influences the appropriateness of donor-specified "conditionality" for loans and other forms of development assistance.

Finally, lasting policy change depends critically on governments' actual belief in the analysis supporting the reforms. There is ample experience showing that governments that have reluctantly undertaken reform programs have reversed them and reimposed the old system of price and trading controls as soon as a drought or other transitory shock has occurred. The demand for, and credibility of, food policy analysis to guide market development is enhanced by a collaborative research process in which local researchers and government analysts can take "ownership" of the research findings. The process of generating local ownership of research findings helps to create a common empirical foundation for donor/host country dialogue. In these ways, the way in which food policy research is undertaken may be as important as the research findings themselves.

## APPENDIX. FOOD ACCESS AND THE PERFORMANCE OF LAND, LABOR, AND FINANCIAL MARKETS

This section provides examples of how household access to food is constrained by the performance of financial, labor, and land markets in sub-Saharan Africa. The discussion is not designed to be exhaustive, but simply indicative of the problems faced by households attempting to rely on these markets.

### Financial Markets

In a complete system of efficient markets, credit and insurance markets would be the principal mechanisms for coping with risk. Households could allocate their land, labor, and capital with a view to maximizing expected income and then use credit and insurance markets to offset unforeseen variations in weather, prices, or the behavior of trading partners. But where insurance markets are limited or absent, households typically respond by reallocating their resources in a manner that reduces expected productivity and incomes in exchange for a more stable level of food availability and cash income. In the aggregate, the pattern of resource allocation under poorly functioning insurance markets perpetuates the poverty trap.

Why are insurance and credit typically unavailable to African smallholders? There is little incentive for commercial banks to lend small amounts to numerous small farmers and entrepreneurs when they can reduce costs of oversight and administration by lending large amounts to larger firms. Subsidized and controlled interest rates, while designed to provide cheaper sources of credit to rural people, largely foreclose these groups' access to credit by preventing banks from charging differential interest rates to compensate for the higher administrative and enforcement costs that numerous small borrowers entail. Rural farmers' and traders' relationship to the commercial banks is largely as depositors only, while the money saved is then transferred to cities and lent to larger enterprises (Rasmussen 1990).

Because commercial banks are often unable to charge higher interest rates to small lenders, most farmers and traders are dependent on informal money lenders and credit unions. But custom and local legal systems often increase the time and effort required by lenders to recover loans (particularly if the lender and borrower are from different ethnic or social groups). Interest rates of informal lenders are thus typically high because of implicit risk premiums (Reynolds 1988). This skews the allocation of loans toward urgent needs (often consumption) and away from potentially more productive investments requiring costs up-front and having payoffs only over the long run.

Poor credit availability may be both a cause and a consequence of low agricultural productivity. High risk of crop failure – and thus nonrepayment of credit – invariably increases interest rates for those who do repay. Low cash resources (caused in part by low-input, low-productivity farming systems) inhibit the generation of savings necessary to self-finance investments in cash inputs. Farmers in such an environment cannot contribute much to the growth of local capital markets. This balance of low-input, low-productivity farming is an outgrowth of mutually reinforcing factors: risky agronomic and market conditions, constraints on financing new

technology adoption, and low-productivity farming systems incapable of generating much of a surplus.

The maintenance of families' food consumption requirements under low-productivity agriculture often requires allocation of labor to non-farm activities (Reardon, Delgado, and Matlon 1992). *Ex-ante* and *ex-post* consumption smoothing are achieved to a large degree through indigenous exchange arrangements (Goetz 1993) and coping mechanisms, including migration of some family members to other agro-ecological zones and remitting income back to the household (Reardon, Delgado, and Matlon 1992). Labor migration and income diversification occur to such an extent in many regions of SSA because local wage employment opportunities are limited and because credit is costly or difficult to obtain. Income diversification is thus not necessarily a sign of success, but sometimes a sign of inability to achieve adequate living standards from farming and local non-farm activities. Remittance income may reflect a problem of stagnant employment opportunities and productivity growth in a given rural area. For example, in their typology of income diversification patterns in Senegal, Kelly et al. (1993) identify two outward oriented income strategies in which households are "pushed" into non-agricultural activities because of a deteriorating agricultural resource base, stagnant agricultural technology, or poorly developed agricultural markets. Especially in the latter two cases, off-farm income comes at the expense of greater agricultural productivity and income. Public investments that foster the development of local financial markets and increase opportunities for profitable private investments in local farming and off-farm activities may reverse the outmigration of labor from these areas.

Unstable and covariant production also necessitates the spatial diversification of resources for credit or insurance pools, if these pools are to remain solvent, or if they are to provide significant risk reduction for members. This diversification is impeded by high information costs and strategic uncertainties associated with operating outside of one's social group. This condition increases the problems of moral hazard and adverse selection which plague many insurance and credit schemes, even in developed economies with relatively well-developed information systems and longer histories of impersonal exchange.[20]

Udry (1993) found that credit transactions were limited to individuals within close geographic areas in northern Nigeria, due to problems of moral hazard and adverse selection. Within villages, the "relatively free flow of information" allows credit transactions to be contingent upon the outcomes of random production shocks of both borrowers and lenders. This "state contingent" characteristic of the credit transactions allows the credit market to also serve an

[20] "Moral hazard" refers to situations in which the cost to an individual of a certain action is less than the cost to society of that action. As a result, the individual engages in the action more often than is socially optimal. For example, someone may be less cautious when insured than when not insured because she knows that her losses from carelessness will be covered by insurance. "Adverse selection" refers to the tendency for individuals with the highest risk factors to be disproportionately represented in insurance schemes while paying the same premiums as other consumers. This raises actual costs beyond expected levels. Adverse selection is made possible by imperfect information.

insurance role and would not be possible without free information flows. But Udry notes that "transactions occurred between people who know each other well," and that "almost no loans are observed to cross the boundaries" of the village (p. 2). Thus, this work supports previous findings (e.g. Bell 1988) documenting the role of moral hazard and adverse selection in limiting the scope of impersonal markets for credit and insurance. Von Braun, et al. (1993) conclude that weak credit access for smallholders is likely to exacerbate the distribution of wealth and incomes in rural areas by forcing poorer and more vulnerable households to sell off assets at distress prices to pay for food during droughts and other disruptions.

Weak credit markets also affect smallholders' access to food through their effect on trader behavior. Credit constraints mean that the volume of food handled by traders is limited by their own working capital. This creates barriers to entry, impedes the achievement of scale economies in distribution, and leads to an under-provision of marketing services compared to a situation where access to credit was easier. Under-provision of services such as storage and transport increases the likelihood of price instability, poor market integration, and higher marketing costs. The result is decreased access to food by vulnerable groups. These problems in turn entrench households' efforts to lessen their reliance on food markets. Opportunities for specialization and income growth based on gains from trade are depressed, reinforcing the poverty trap.

In summary, protecting vulnerable groups' access to food often requires access to credit for both food and farm inputs. But this access is weakened by ceilings on formal lending rates, low-productivity agricultural systems, weather variability, limited sources of collateral, and information barriers leading to moral hazard and adverse selection. Poorly-functioning financial markets in turn generate side effects that reduce future productivity growth: liquidation of productive assets during droughts, forced labor migration, and malnutrition.

**Labor Markets**

Within the farming systems typical of SSA, on-farm labor demand tends to be highly synchronous across households, both seasonally and over years. Within a region, households generally follow similar cropping strategies and apply similar inputs, generally limited to labor and some hand implements. Labor for land preparation, weeding and harvesting is most scarce when it is most needed, and most available when it is least needed. The shortage or high price of labor at critical periods in the crop cycle impedes area and yield expansion and the supply responsiveness of smallholder agriculture.[21]

Binswanger and McIntire (1987) suggest that low, stable levels of technology across households and high costs of supervising hired labor make it unattractive for most smallholders to offer a wage sufficient to attract hired labor. They argue that the marginal product of labor varies little

[21] This fact explains in part why animal traction has been so critical in many areas of SSA in allowing farmers to increase area planted to food crops under more intensive production techniques. See, for example, Boughton (1993) for evidence from Mali.

across farms, since "cultivated area per working household member is largely invariant to household size or wealth" (p. 77). Given supervisory costs for hired labor (or a lower marginal product of hired labor in the absence of supervision), "a worker's output is at least as large on his own plot as it is on his employer's plot. Therefore, the employer cannot compensate a worker ... for the worker's foregone output in self-cultivation" (p. 76). Labor demand is thus constrained.

Contrary to Binswanger and McIntire's suggestion regarding land access, there is evidence that cultivated area per household laborer varies significantly across households, even in ostensibly "land abundant" settings.[22] Even with the same simple technology across households, the marginal product of labor may vary because labor input may be combined in varying proportions with land. Differential access to capital (which may be used to finance animal traction or fertilizer) also causes the marginal value product of labor to vary across farms. Collier (1989) also observes this but arrives at a conclusion similar to Binswanger and McIntire by noting that, since weather is stochastic, the marginal product of labor is uncertain at the time it is hired. Employers demand a risk premium, often pushing the expected marginal value product of hired labor below potential laborers' reservation wage. Collier relies on this characteristic in combination with high supervisory costs to explain the lack of any significant labor market among smallholders in Kenya.

The evidence suggests, therefore, that uncertain returns to hired labor and high information and supervisory costs constrain the demand for labor by widening the difference between potential laborers' reservation wage and potential employers' offer price. This problem is accentuated by poor communication and transportation infrastructure. High transaction costs in labor markets impede on-farm specialization and thus productivity growth and output expansion. High transaction costs also impede the transfer of labor from the agricultural sector to other sectors, which is essential if agricultural labor productivity and farm incomes are to rise.

**Land Markets**

Recent attention has been directed toward the question of whether indigenous land tenure arrangements constrain farmer innovation and investment (Noronha 1985; Migot-Adholla et al. 1991; Platteau 1991; Bruce 1993; van den Brink and Bromley 1992). This literature also provides some insights as to the effects of indigenous land arrangements on households' access to food. The argument is often forwarded that farmers require long-term security of tenure to make investments that promote the long-run productivity and sustainability of the land. It is also held that indigenous tenure arrangements often deny African farmers the ability to make certain kinds of land improvements that would promote productivity. Bruce (1993) provides two common examples. The first is where the community's livestock is allowed onto the fields after harvest to graze crop residues. Because a farmer's livestock is free to range with all the others, it may be considered unfair for him/her to intensify use of his/her land in a manner that requires

[22] See Tschirley and Weber (1994) for evidence from Mozambique. See also Platteau (1991), especially Chapter Four, for a general review of the issue in SSA.

exclusion from such grazing. A second example is where the planting of trees might tie down the use of land for longer than is considered appropriate, and fencing might exclude neighbors' right of commons outside the cropping season. The community may thus seek to prohibit these activities and in this way constrain innovation and productivity growth, with potentially adverse effects on access to food over the long run.

The relationship between the land markets (presumably leading to private land titling) and agricultural productivity has been challenged by numerous commentators (e.g. Migot-Adholla et al. 1991; Bruce 1993; van den Brink and Bromley 1992; Basset and Crummey 1993). This literature stresses that security of access to the income stream from the land is the critical determinant of future productivity-enhancing investments in land, not formal titling. Bruce (1993) argues that:

> the causes of insecurity of tenure are diverse, and many have little to do with the rules of indigenous systems. It may arise from abuse of power by traditional land administrators in hierarchical systems, or from their ineffectiveness in enforcing rules in political or economic circumstances which have undermined their authority. Competition between ethnic groups, land grabbing by new elites and such arbitrary government action as taking without compensation or granting concessions inconsistent with existing rights are emerging sources of insecurity of tenure that may prove in the long run more serious than deficiencies in the substantive rules of indigenous systems (p. 40).

Notwithstanding the validity of Bruce's statement, weak security of possession under freehold tenure systems does not assure that land rights are more secure under customary land tenure arrangements.

More importantly, it has been difficult to argue that customary usufructory land tenure arrangements[23] result in land allocations that are either pareto-efficient or provide the most productive use of scarce land. Low (1986), based on extensive examples from southern Africa, argues that usufructory land tenure arrangements have resulted in a situation of declining land productivity even under increased population density. Because land serves a number of important purposes in addition to farming – a dwelling place, source of raw materials for consumption goods, a form of social security after retirement – households are reluctant to migrate off the land, even when more profitable off-farm activities become available, for fear of losing usufructory rights to the land. Instead, increased off-farm wage opportunities over the decades in much of Southern Africa have resulted in specialization of farm and non-farm activities *within* households rather than *across* households. That is, rather than moving off the farm when one or more family members secured a relatively high off-farm employment opportunity, households have tended to fragment, with some members migrating off-farm while other (usually less productive) members remain on the farm to maintain usufructory land rights

[23] i.e. authority for delegating land is vested in the traditional power structure, but once delegated to a household, that household is given use rights to the land as long as its members continue to utilize the land.

while simultaneously engaging in numerous other activities (child care, fuel and water provision, tending to cattle, schooling, food preparation). For these fragmented households (40% of rural Zimbabwean households, by some estimates, and over 50% in Swaziland and Lesotho), relatively low amounts of labor are devoted to farm production, resulting in less productive land use than would occur if farmed by households that were willing to specialize in farming and more intensively utilize available land resources (Richards, Sturrock, and Fortt 1973; Yudelman 1964).

Therefore, the land tenure debate has been misplaced in one important respect: the difference between freehold and customary tenure rests not only on the security of the use right, but also on the nature of the costs of maintaining the use right. As stated by Low (1986),

> under freehold tenure, there is an opportunity-money cost involved in maintaining usufructory rights, which is related to the productivity and scarcity of the land. Under usufructory rights, there is no money cost involved. Instead, there are time costs, but these are related less to the productivity or scarcity of the land than to the opportunity costs of using this time in other non-market or market production. These opportunity costs will often be minimal for certain household members *(e.g. those with low levels of education or training)* and can be covered by labor-extensive subsistence cultivation. Covering opportunity costs of maintaining freehold use rights, on the other hand, requires a minimum value of production per unit of land (p. 163).

While certain land tenure features may impede productivity growth, it must be understood that these features are not isolated, inconvenient facts but important cogs in a socioeconomic system that continues to perform important functions for farmers (Bruce 1993). Indigenous tenure systems place great emphasis on risk management. These systems may reduce the risk of a household not surviving a drought or other short-term crisis. But if such arrangements tend to impede productive investments over time, their effects on access to food, relative to more market-oriented land-tenure arrangements, may be different over the short and long runs.

Apart from the question of appropriate tenure arrangements to govern the use of land already allocated, is the issue of the initial distribution of that land. The performance of markets are fundamentally shaped by the distribution of assets. In some cases, a more equitable redistribution may be necessary to achieve income growth on a broad enough basis to stimulate the development of markets.

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