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**Food Security Policy and the Competitiveness  
of Agriculture in the Sahel:  
A Summary of the "Beyond Mindelo" Seminar**

by

**Thomas S. Jayne and Nicholas Minot**

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**FOOD SECURITY POLICY AND THE COMPETITIVENESS OF AGRICULTURE  
IN THE SAHEL: A SUMMARY OF THE "BEYOND MINDELO" SEMINAR**

**EXECUTIVE SUMMARY**

This report summarizes the results of the USAID-sponsored "Beyond Mindelo" conference on food security policy and the competitiveness of agriculture in the Sahel. The conference convened to provide a forum for representatives of USAID, the World Bank, International Food Policy Research Institute, and other European and American universities, development organizations, and government agencies to discuss the implications of recent research results in the Sahel before the December meeting of the Donor Advisory Group of the Club du Sahel.

Evidence is emerging throughout the Sahel and Africa in general that the image of "urban consumers" and "rural producers" of food is an oversimplification. A significant portion of rural households depend on local food markets for their food security. Higher grain prices appear to have a negative impact on not only urban consumers but also, at least in the short run, on a large segment of the rural population that are net purchasers of food grains.

Rice plays a much more important role in the diets of the Sahelian poor than previously thought, accounting for about half of total cereal purchases in urban Mali and Burkina Faso. The proportion of grain expenditures devoted to rice appears constant across rich and poor income classes. Available data indicate that rice consumption is quite insensitive to price. The growth in rice consumption throughout the Sahel is driven primarily by urbanization. Rice is easier to prepare than coarse grains and saves both time and cooking fuel, which are particularly important in urban areas. For these and other reasons, rice and coarse grains do not appear to be close substitutes in consumption.

It is becoming increasingly clear that a significant portion of rural households in the Sahel are unable to produce a grain surplus because of interrelated production and marketing constraints. The ability of these farmers to respond to price incentives is contingent on the development of complementary production incentives: reliable input and product markets, production and processing technology, and physical and institutional infrastructure. Currently, the marketed supply of coarse grains in Mali and Senegal is produced primarily by a small set of relatively well-equipped farmers located in high potential regions with adequate market infrastructure. Policies designed to stimulate production through price incentives alone can be expected to have highly concentrated benefits. Moreover, such policies will exact a high cost in terms of urban and rural food insecurity among net food purchasers, at least in the short run. This does not suggest that price incentives should not be included as part of a long-run food policy, but it does indicate the severity of the food price dilemma in these countries.

Recent supply and price gyrations throughout the Sahel reflect the severity with which weather variations can affect prices in thin markets where only a small portion of production is marketed. Sporadic and unpredictable government buy-sell activities in Mali and Niger have also introduced much uncertainty into the market, and may impede private sector grain storage. Moreover, past experience demonstrates that Sahelian governments lack the resources to effectively control cereal prices.

Greater focus on developing viable research institutions compatible with semi-arid production characteristics in the Sahel is critical to long-run food security in the region. This will require sustained funding, technical assistance, strong management, and a long-term time horizon.

While the current pace of ongoing reform provides great opportunities to enhance food security, the "vacuum theory of privatization", under which private traders immediately fill the void left by state withdrawal from the market, is not supported by ongoing research findings. Greater focus on the identification and alleviation of the constraints facing the private trade may stimulate greater private investment and initiative in the food system. Strategic public sector investments in marketing and legal infrastructure, production and processing technology, and education, will encourage private investment in the food system, thereby enabling producers to respond to market opportunities.

Although existing empirical data present serious questions about the viability of a regional protected cereals market in the Sahel, policy must still deal with the legitimate concerns that were the impetus behind the protected market proposal, including the desire to stimulate demand for locally produced coarse grains that account for 90 percent of cultivated area in the Sahel, and to reduce dependence on imported cereals. Policies discussed as alternatives to the protected market proposal included currency devaluation, a flexible price policy environment, and non-price actions (such as the development and promotion of low-cost processing techniques) to raise the demand for locally produced coarse grains.

Although there was a lack of consensus on whether and how to insulate domestic markets from world markets, there was broad agreement that freer trade within the Sahel and West Africa in general was advisable. The timely dissemination of price and transactions information, while instrumental in improving the efficiency of grain markets in the Sahel, may be even more valuable in raising the level of discussion between donors and governments. A development approach that treats policy extension, research, and local human capital formation as joint products can simultaneously raise the domestic supply of and demand for research and analytical capacity, thereby elevating the level of policy dialogue between donors, researchers, and governments.

#### QUALIFICATION OF SEMINAR FINDINGS

In considering the policy implications of findings discussed in this seminar, some have concluded that coarse grains are a "declining industry" in the Sahel that should be abandoned in favor of cash crops, imported rice,

and nonfarm activities. Careful analysis, however, indicates that coarse grains (millet, sorghum, and maize) will and should continue to play a key role in Sahelian food security for many years to come. Specifically:

- One must be careful not to overextrapolate the findings regarding urban consumption patterns to rural areas. Although rice has become increasingly important in urban diets, even among the poor, it is still a luxury item in the rural areas of the land-locked Sahelian countries. Since the majority of Sahelians live in these areas and continue to derive most of their calories from coarse grains, not rice, increasing the productivity of coarse grain production would be one of the most direct ways of improving their food security.
- The research has shown that in many areas of the Sahel a large number of rural households (in some cases the majority) are net purchasers of basic staple grains. This does not mean, however, that these households rely on the market for most of their cereals. The majority of these households continue to cover most of their consumption needs from their own production, purchasing only enough to meet the shortfall between home production and home consumption.
- The research has also revealed that demand for coarse grains, particularly in urban areas, is limited by processing constraints that make these cereals more difficult and time-consuming to prepare. This constraint has tended to shift consumption towards the more easy-to-prepare rice. The logical policy conclusion, however, is not to abandon production of coarse grains, in which the Sahelian states appear to have a comparative advantage, in favor of rice. Rather, increased efforts are needed to develop improved, low-cost processing methods that will produce coarse-grain products that are as easy, quick, and cheap to prepare as rice.
- Finally, the research has shown that lack of income rather than lack of total grain supply is the key determinant of food insecurity for most Sahelians. It would be a mistake to conclude, however, that Sahelian governments and donors should therefore drop efforts to increase the productivity of coarse grains, instead concentrating exclusively on high-value cash crops and non-agricultural activities. Promoting cash crop production among smallholders and non-agricultural activities can strengthen the poor's incomes and hence access to food. But there are strong complementarities between production of basic staples, cash crop production, and nonfarm activities. Because of the historical unreliability of markets for staples, Sahelian farmers are reluctant to undertake cash-cropping until they have produced a secure supply of basic staples. It is unrealistic to expect rural Sahelians to shift to reliance on the market for the bulk of their food in the near future, so improving the productivity of staple food crops is a key step in increasing their incomes. By allowing these households to produce a large part of their consumption needs with fewer resources, resources will be released for other income-generating activities. In addition, the historical experience of countries throughout the world has shown that the generation of a reliable food surplus is a prerequisite for the

structural transformation of the economy from one based largely on subsistence agriculture to one in which a large proportion of income is generated from cash crops and nonfarm activities. Moreover, as income expands from these other activities, the total demand for the basic staples will rise, both for direct human consumption by the poor, whose level of calorie consumption is currently inadequate, and for indirect consumption, in the form of livestock products, by higher income groups.

The bottom line is that coarse grains will remain an important component food security in the Sahel during the next 10-20 years. While it would be a mistake for Sahelian governments and donors to adopt a "Food First" strategy that ignores the important contributions that cash crops and non-farm activities can make to raising incomes and hence food security, it would be equally unwise to abandon efforts to increase productivity in coarse grain production, processing, and marketing.

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Thomas S. Jayne and Nicholas Minot  
Michigan State University

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## FOOD SECURITY POLICY AND THE COMPETITIVENESS OF AGRICULTURE IN THE SAHEL: A SUMMARY OF THE "BEYOND MINDELO" SEMINAR

### I. INTRODUCTION

Because grains play a central role in the diet of the Sahelian countries, cereals policy is a critical component of food security strategies in the region. Cereals consumption is dominated by locally-produced coarse grains, principally sorghum and millet, supplemented by growing quantities of rice and wheat, most of which is imported. The growth of rice and wheat imports in the face of falling per capita consumption of locally-produced sorghum and millet is a matter of serious concern, although this trend is less pronounced among the land-locked countries. The supply of cereals is subject to serious weather-induced fluctuations and often erratic availability of food aid. At the same time, many of the countries in the region have introduced structural adjustment policies to deal with fiscal and trade deficits and to improve the performance of the economy. These new policies generally include less government participation in grain and input distribution, and a corresponding transfer of marketing functions to the private sector.

In this context, there is a clear need for timely and relevant information to guide policy and improve food security. Policy-relevant research carried out by a variety of institutions is contributing to our understanding of the agricultural and food economy of the region. Researchers from Tufts University have analyzed expenditure patterns of 586 urban households in Mali (Rogers and Lowdermilk). The International Food Policy Research Institute (IFPRI) has conducted a consumption survey in Burkina Faso and a study of the rice sector in the Gambia (Reardon, von Braun). Michigan State University (MSU) is studying the impact of reforms in the cereals sector in Mali and Senegal (Dione and Staatz, Crawford). Similar work in Niger is being conducted by the University of Michigan (Josserand and Casey). These studies indicate a rural economy more complex and heterogeneous than previously supposed. In some cases, the results contradict commonly held assumptions upon which policy recommendations have been made.

This report summarizes the research findings and discussion of the USAID and MSU-sponsored "Beyond Mindelo" conference on food security policy, held in Washington D.C. in October, 1988. The objective of the conference was to inform representatives of USAID of recent research findings before the December meeting of the Donor Advisory Group of the Club du Sahel. Conference participants included representatives of USAID, the World Bank, IFPRI, MSU, and a number of other European and American universities, government agencies, and development organizations <sup>1</sup>.

## II. CHARACTERISTICS OF CEREALS CONSUMPTION IN THE SAHEL

### A. Trends in Cereal Consumption

Over the past few decades, consumers in the Sahel have gradually shifted from locally-produced sorghum and millet toward rice and wheat, most of which is imported. From the early 1960s to the early 1980s, per capita consumption of rice and wheat increased by 16 kg, while that of sorghum and millet fell by 22 kg. As a result, rice and wheat have grown in importance from 13% to 23% of the volume of grain consumption (Delgado, Delgado and Reardon).

Imports account for about two thirds of the supply of rice and wheat in the Sahel, equivalent to around 15% of the total grain supply. However, the degree of reliance on imports varies greatly among countries. The coastal countries depend to a greater degree on imports of rice and wheat, which represent 39% of grain consumption in the Gambia, 63% in Mauritania, and 46% in Senegal. By contrast, the landlocked countries, facing higher transport costs, depend on imported rice and wheat to a much smaller degree, the percentage ranging from 3% in Chad to 8% in Mali (Delgado and Reardon).

### B. Importance of Grain Purchases in Rural Areas

A number of studies indicate that the image of "urban consumers" and "rural producers" of food grains is an over-simplification. The IFPRI study in Burkina Faso found that purchases represented over 30% of the caloric intake of rural households in a Sahelian village and almost 40% in a Sudano-

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<sup>1</sup>. A list of participating institutions and individuals is in Annex A.

Sahelian village. The proportion rose to over half during the "hungry season" (Reardon). In Mali, a survey of 190 farm households revealed that 39% were net buyers of coarse grains (Table 1). Since the survey was carried out in two major grain producing areas (the OHV and CMDT zones) during a good production year, the proportion of net purchasers of coarse grains would presumably be even higher elsewhere in Mali and during poor production years (Dione and Staatz).

In Senegal, the proportion of farm households that were net buyers of grain was 100% in the northern groundnut basin, 62% in the central groundnut basin, 38% in the upper Casamance, and 30% in the southeastern groundnut basin (Crawford). Even higher proportions of net buyers have been found in Somalia for maize and in Rwanda for beans and sorghum, as shown in Table 1. The total number of households purchasing grain is, of course, much higher

TABLE 1: MARKET PARTICIPATION PROFILE FOR RURAL HOUSEHOLDS  
IN SELECTED AFRICAN LOCATIONS

Country	Year	Crop(s)	% of households that are:		
			net buyers	no net sales or purchases	net sellers
Mali	1985-86	Coarse grains	39	13	48
Senegal	1986-87	Coarse grains	30	40	29
Somalia	1986-87	Maize	61	0	39
Rwanda	1986-87	Sorghum	66	9	33
		Beans	73	5	22
Zimbabwe	1984-85	Maize	15-25 *	18-30 *	67-45 *

SOURCE: Adapted from Jayne and Weber. Data are from USAID/MSU research conducted under Food Security in Africa Cooperative Agreement. Mali: 190 households in CMDT and OHV zones (Dione). Senegal: 215 households in southeastern region (Goetz). Somalia: 308 households in lower Shebele region (Wehelie). Rwanda: 1000 households nation-wide (Loveridge). Zimbabwe: 204 households in smallholder farming region (Rohrbach).

\* Range represents high and low rainfall regions.

than the number of net purchasers. The implication is that the rural population is quite heterogeneous and that policy does not affect them uniformly. In particular, higher grain prices would have a negative effect not just on urban consumers but also (at least in the short run) on a significant portion of the rural population that are net purchasers of grain.

### C. Rice Consumption among Low-Income Households

Although rice is often considered a high-income grain in the Sahel, recent evidence reveals that this is not always the case. The Tufts expenditure survey of 576 urban households in Mali found that rice expenditures as a proportion of grain expenditures were constant across income classes. Although the higher income households consumed greater quantities of grain in absolute terms, the relative importance of rice and of coarse grains did not vary significantly. Cereals contributed roughly three quarters of the total caloric intake, of which rice represented about half (Rogers and Lowdermilk).

Similar results were obtained from the IFPRI expenditure survey in Ouagadougou: across all income classes, rice represents about one third of the volume of grain consumption. In value terms, rice actually comprises a larger share of the budget of low-income households for two reasons. First, food constitutes a larger share of the budget of low-income households. Second, low-income households purchase a greater share of their rice in cooked form while working away from home, resulting in higher unit costs for these households (Reardon).

Another study reports that both urban and rural low-income households in the Gambia "spend a proportionately higher share of their income on food, in general, and rice, in particular" (Kinteh and von Braun, p. 51). Finally, rice purchases in rural Senegal are significant, averaging 20 to 65 kg per adult equivalent per year, depending on the region (Crawford). Thus, at least in the Gambia and in urban Mali and Burkina Faso, rice cannot be considered a "luxury good." In fact, higher rice prices would cause a greater relative decline in the real incomes of the poor. This result highlights the importance of careful evaluation of the distributional effects of price policy.

#### **D. Substitution between Coarse Grains and Rice**

The weight of current evidence indicates that rice and coarse grains are not close substitutes in the eyes of Sahelian consumers, at least in the short run. Econometric analysis of the Tufts urban survey data from Mali found low cross-elasticities of demand between rice and coarse-grains (Rogers and Lowdermilk). In other words, if the price of one rises, the increase in the consumption of the other will be modest, particularly in the short run. Similarly, the IFPRI study of urban consumption patterns in Burkina Faso found little substitution between rice and coarse grains (Reardon).

In the long run, relative prices may have more influence on consumption patterns. Over the long term, prices for rice and coarse grains in Mali and the Gambia move roughly parallel, implying some substitutability between the two (Staatz, von Braun). Yet a major study of four Sahelian countries over the period 1970-83 concluded that shifts in relative prices were not a significant factor in explaining the increase of rice and wheat consumption relative to coarse grains (Delgado and Reardon). Rather, the process of urbanization appeared to be the major factor behind this shift in consumption. This is presumably because rice is easier to prepare, and the savings in terms of cooking fuel and time are particularly important in urban areas. While some analysts raise questions about the interpretation of these results (Shapiro and Berg), most agree that rice and coarse grains are not close substitutes, and that using price policy alone to encourage substitution of one for the other would require a substantial shift in relative prices, sustained over a number of years.

Other non-price factors further contribute to low substitutability between rice and coarse grains. A survey of consumer attitudes in rural Senegal found that each grain filled a particular dietary or cultural niche. When asked which grain(s) they would choose if they could have ten free bags, all respondents chose an almost equal combination of rice and coarse grains (Crawford). For example, millet and sorghum were perceived to provide greater stamina before working, and rice was appreciated for its ease of preparation. Given the premium placed on convenience, even in rural areas, more research is needed into ways of processing coarse grains that

reduce the time and costs of home preparation, thus stimulating local production by increasing demand.

### III. CEREALS PRODUCTION AND COMPARATIVE ADVANTAGE IN THE SAHEL

Production incentive, broadly conceived, is a function of the producer price of the commodity, the costs of factors of production (land, labor, fertilizer, etc.) and the productivity of those factors. Each will be discussed in this section, as well as the issue of comparative advantage in general.

#### A. Price Policy in the Sahelian Cereals Sector

Most agree that the current trend toward liberalization of prices and markets is desirable, reversing long-standing discrimination against the agricultural sector. On the other hand, two qualifications are necessary. First, price reform will have a limited impact without complementary investments that enhance producers' ability to respond to price incentives. Second, raising cereals prices above international prices would be difficult to sustain, and, even if successfully implemented, would create negative equity effects and only modest increases in production.

On the first point, it is by now well recognized that, for individual agricultural commodities, the short-run supply response to producer prices is limited (<sup>2</sup>). Although few studies have tried to estimate aggregate agricultural supply response, it is undoubtedly even smaller (Shapiro and Berg). This is particularly true under conditions of traditional technology, poor transport infrastructure, and weak marketing systems. Delgado argues that structural adjustment policies to remove the bias against agriculture "should not divert national governments or donor agencies from the real agenda ... : increasing the ability of farmers to produce, and thus to respond to price incentives" (Delgado, p. 5). This involves building institutions for effective agricultural research and extension, developing

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<sup>2</sup>. In a survey of 103 studies of grain supply response, Scandizzo and Bruce report that 71 percent of the estimated short-run elasticities were below 0.5. In the long run, 62 percent were below 0.5.

responsive marketing systems, and improving input and credit markets (Eicher).

On the second point, the difficulties in implementing support prices for locally-produced crops are well-known. Given the permeability of borders and the small proportion of the harvest that is marketed, purchases large enough to affect prices are often beyond the financial and logistical capacity of marketing boards (Dione and Staatz). Raising the price of imported grains such as rice is administratively easier, this being the idea behind a regional cereals protection policy in the Sahel. But the success of such a policy depends on the supply response of grains. A recent study in Senegal used a macro-micro simulation model to evaluate the effectiveness of various policies in improving cereal self-sufficiency (Martin and Crawford). In the model, rice, sorghum, and millet show very limited supply responses to price increases, rice because of constraints on suitable land, sorghum and millet because they are much less profitable than groundnuts as a source of cash. For example, even a 100% increase in cereals prices raises the rate of cereals self-sufficiency by less than 10 percentage points. On the other hand, the simulations indicate that maize supply may be quite responsive to price. However, maize demand is constrained by two factors. First, the lack of techniques to produce easy-to-prepare forms of maize limits the demand for human consumption, and second, the unreliability of local supply forces producers of animal feed to use imported maize.

A related problem with a cereals protection policy is its distributional impact. The effect of raising grain prices on both urban and rural consumers was considered in sections 2.2 and 2.3. With regard to producers, a number of studies have found that the bulk of the benefits of a support price policy would accrue to a small minority of rural households who are able to produce grain surpluses (Table 2). In the grain producing zones of Mali, 20% of the farms account for 80% of the grain sales (Dione and Staatz). In the grain producing southeast of Senegal, 15% of the farms supply 80% of the grain that reaches the market (Weber et al.). If less productive regions were included in the calculation, the concentration would be even greater. Further concern over the distributional effect of a price support policy is raised by indications that the net sellers may be the

relatively well-off producers. Although income figures are not available, the net sellers tend to have more animal traction equipment and greater per capita agricultural production than the average farm household (Crawford, Dione and Staatz, Goetz et al.). Note that this pattern is not unique to the Sahel: similar patterns have been found for maize sales in Somalia, bean and sorghum sales in Rwanda, and maize sales in the "communal sector" of Zimbabwe (Weber et al.).

TABLE 2: CONCENTRATION OF MARKETED SURPLUS AMONG RURAL HOUSEHOLDS IN SELECTED AFRICAN LOCATIONS

Country	Year +	Crop(s)	% of households that provide:		
			50% of sales volume	70% of sales volume	80% of sales volume
Mali	1985-86	Coarse grains	8	16	23
Senegal	1986-87	Coarse grains	7	11	15
Somalia	1986-87	Maize	-	13	20
Rwanda	1986-87	Sorghum	2	4	5
		Beans	2	4	6
Zimbabwe	1984-85	Maize	-	10 *	-

SOURCE: Adapted from Jayne and Weber. Data are from USAID/MSU research conducted under Food Security in Africa Cooperative Agreement.

See notes under Table 1.

+ All years were average or better than average in terms of rainfall.

\* National estimate for the smallholder communal sector.

## B. Importance of Agricultural Research

Although the debate over production incentives has focused on producer prices, an equally important element is the productivity of factors of production. On equity grounds, improving productivity has two advantages over price support policies as a method of promoting agricultural production. First, support prices have a negative effect on urban and rural consumers, whereas productivity improvements can benefit producer and consumer. Second, the benefits of a price support policy are concentrated

among a small number of surplus producers, whereas new agricultural technology, particularly if it is highly divisible (<sup>3</sup>), is more likely to benefit a wider range of farm households, including those producing mainly for home consumption.

Although studies in Asia, Latin America, and the industrialized countries show a high rate of return to investments in agricultural research, the development of an effective system of research and extension requires sustained funding, technical assistance, and strong management. A recent review of agricultural research in sub-Saharan Africa (Eicher) makes several points. First, institution building efforts must be tailored to the level of scientific, political, and institutional development of each country rather than being based on models from Asia and Latin America or on an Africa-wide model. Second, the donor agencies have on occasion provided more financial assistance than intellectual guidance, focusing on building construction and vehicles rather than technical assistance. Third, the regional agricultural research centers in the CGIAR system should play a larger role in building sustainable national agricultural research institutions in Africa. And finally, support for agricultural research must be thought of in terms of decades rather than years, due to the challenges of institution building and the long pay-off periods for research.

At the same time, most observers emphasize that technical improvements in coarse grain production in the Sahel will probably not take the form of high-yielding fertilizer-responsive varieties as in Asia. Matlon (cited in Shapiro and Berg) states that improvements in sorghum and millet production in the drier zones (less than 600 mm of rainfall) will be through the development of drought-resistant varieties and water and soil conservation. In higher rainfall zones, there is some scope for higher-yielding varieties and fertilizer use, but competing crops, such as maize, rice, and cotton, will be more profitable in many areas.

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<sup>3</sup>. Divisibility refers to the ability to purchase a technology in small quantities, as is the case for improved seed and fertilizer. Divisible technology is more likely to be adopted by small farmers than "lumpy" technology such as tractors, other things equal.

### **C. Relationship between Grain Production and Cash Crop Production**

Cash crop production in Africa is often criticized because it uses land that could otherwise be devoted to produce food. Although there is a trade-off in resource use, two factors must be kept in mind. First, there are also important production complementarities between cash-crop and food-crop production. Second, maximizing household food production does not necessarily maximize household food consumption.

Research in Mali shows that cotton production was positively correlated with grain production on the same farm (D'Agostino). This result may have several causes. First, grain grown in rotation with cotton benefits from the residual effects of cotton fertilizer. Second, cotton sales help finance purchases of animal traction and inputs which are used in grain production. Third, cotton revenue relieves cash shortages, allowing more flexibility in the timing of grain sales. Fourth, on a regional basis, cotton revenue has also financed basic infrastructure that contributes to better cereals market integration (Dione, cited in Weber et al.). Similar results were found in southeastern Senegal (Goetz, cited in Weber et al.).

Second, maximizing household food production does not necessarily maximize food consumption. A diversified strategy which combines food and cash crops, livestock and non-farm activities may stabilize incomes and allow households to purchase a greater amount of food than could have been produced on the farm with the same resources. A survey of three zones in Burkina Faso revealed that the Sudano-Sahelian sample was the most specialized in grain production, yet had the lowest incomes and caloric levels. In two other zones, farm households produced insufficient quantities of grain but were able to more than compensate with grain purchases financed by livestock sales and non-farm activities (in the Sahelian zone) and by cotton sales (in the Sudano-guinean zone) (Reardon). The IFPRI survey in rural Gambia indicates that caloric intake is related to income, in cash or in kind, rather than rice production (von Braun and Puetz). These results confirm patterns found elsewhere in Africa (see von Braun and Kennedy).

### **D. Comparative Advantage of Agriculture in the Sahel**

The comparative advantage of a commodity depends on its cost of production and marketing, which is influenced by physical and human

capital, scale economies, technology, exchange rates, and domestic and international demand, all which can vary over time and space. Costs, and thus comparative advantage, can be influenced by policy and government investment. For example, government efforts to develop effective research and marketing institutions affect the generation and use of technology, and therefore, costs of production. The Sahel has a comparative advantage in cotton production largely as a result of effective agricultural research and input marketing that has raised yields four-fold since independence, thus reducing production costs.

One way to evaluate comparative advantage is with domestic resource cost studies, which compare efficiency of commodities in generating foreign exchange (for exports) or saving it (for import substitutes). Reviewing a few such studies of Senegal and Mali, Shapiro and Berg conclude that "a switch from export crops to cereals (especially rice) would worsen the foreign exchange situation" (p. 8). However, the competitiveness of different crops is very sensitive to transport costs, which are influenced by public investments in infrastructure. Further from the ports, export crops become less competitive relative to import substitutes such as coarse grains.

The comparative advantage among commodities also varies over time as a result of changing world prices, production technology, and transport infrastructure. For example, cotton prospects are said to be good in the foreseeable future, whereas groundnuts face increasing competition from European oilseeds and Asian oil palm. Fresh fruit and vegetable exports to Europe are growing, although quality and timing are critical, and the Sahel faces competition from North Africa. According to many analysts, livestock products present important possibilities for increasing intra-African trade (Holtzman).

Some observers hold that the public sector is not likely to be very successful in identifying growth industries due to political influence and its inexperience in commerce (Berg). In this view, growth is best facilitated through the establishment of a policy environment that will allow market forces to identify and promote products with a comparative advantage. The opposing point of view holds that the government must play an active role in identifying and promoting growth sectors, taking

advantage of its broader perspective on the economy and certain economies of scale.

In trying to balance these points of view, it is clear that some commodity priorities must be established to guide public investment in agricultural research, transportation infrastructure, and other "public goods." At the same time, the complexity and unpredictability of market trends argue for a policy that minimizes discrimination among activities with respect to price policy, trade regulation, credit availability, and taxation. It is clear that public investments that are not restricted to any one commodity are more flexible in the face of changing economic opportunities. Yet there is often a trade-off between flexibility and productivity: low per-unit costs frequently require specialized investments suited to a particular purpose.

#### **IV. MARKET AND TRADE POLICY ALTERNATIVES**

The appropriate mix of public and private sector activities in the marketing system continues to be the subject of intense debate. Drawing from ongoing research on marketing policy reform in Mali, Niger, Senegal, and Burkina Faso, this section addresses (a) the restructuring of grain markets and prices, (b) measures to promote private investment in the marketing system, (c) trade policy issues, (d) the use of food aid, and (e) the ongoing policy dialogue between governments and donors.

##### **A. Restructuring of Grain Markets and Prices**

The recent experiences of market restructuring in Mali, Niger, and Senegal provide several price policy insights. First, market liberalization does not necessarily imply remunerative producer prices or incentives, as is sometimes argued. Following reforms, cereal prices plunged precipitously in 1985 and 1986 in Mali, Niger, and Burkina Faso. This demonstrates the severity with which weather-induced production increases can affect prices in thin markets where only a small portion of production is marketed (Dione and Staatz, Josserand and Casey, Reardon). The effect that such price instability may have on investment in the food system by farmers and traders is a cause for considerable concern (Reardon, Bremer). However, there was a

general consensus that most Sahelian governments lack the resources to control cereals prices (Staatz, Shapiro and Berg, Josserand). The European Commission paper has proposed an alternative to fixed producer prices: stabilize prices within a given range, based on some trend of past market prices. While allowing prices to fluctuate freely within some specified range would require fewer public resources than a fixed price policy, substantial budgetary and analytical capacity would still be required (the more narrow the range, the higher the costs). Moreover, successful maintenance of the price band would depend on accurate forecasts of future supply/demand conditions, not necessarily past price movements.

Policy reform, through its effect on prices and costs, may produce important distributional consequences. The concentration of marketed surplus among large, relatively well-equipped producers suggests that price supports for coarse grains may have highly concentrated benefits. Ongoing research in the Sahel has consistently found many rural households (the majority in some cases) to be net consumers of coarse grains (von Braun, Dione and Staatz, Reardon, Goetz et al.). Even with higher prices, these farm households lack the ability to produce a grain surplus because of insufficient labor or land, poor access to inputs, or inability to afford animal traction to increase production. Therefore, efforts to stimulate production via price incentives may exacerbate food insecurity in both urban and rural areas, at least in the short run. Similar distributional effects are important considerations in the analysis of a protected regional cereals market.

Despite the shift throughout much of the Sahel toward greater reliance on private marketing, storage, and price formation, governments' use of buffer stocks and other forms of supply management remains common. Research in Mali and Niger indicates that sporadic and unpredictable government buy-sell activities have increased rather than reduced uncertainty in the market, and have impeded private sector grain storage (Dione and Staatz, Josserand and Casey). On the other hand, government participation in cereal markets has been critical for the food security of the rural poor in northern Burkina Faso (Reardon). During the 1984/85 drought year, these households were able to acquire over one-third of their cereal needs from subsidized government sales. While some type of buffer stock scheme may be justified, especially

in landlocked countries where imports cannot immediately relieve supply shortages, government behavior in the market needs to conform to established rules that will not exacerbate uncertainty or impede private grain storage.

There was less consensus on the issue of input subsidies. Shapiro and Berg argue against subsidized fertilizer distribution based on the empirical record over the past 25 years: questionable economic profitability, late deliveries, inequitable distribution, the adverse effect of subsidies on the emergence of private distributors, etc. However, it may be useful to separate the concept of government input distribution from subsidies since neither implies the other. The largely successful experience of government involvement in cotton input and product marketing in francophone Sahel merits further analysis before rejecting public sector support in input distribution (Lele). Other studies indicate that the transition to a privatized input distribution system may significantly increase fertilizer prices due to high start-up costs and risks, which would reduce fertilizer use and coarse grain yields (Goetz et al.). Strategic public sector investments may be necessary to induce private sector investments in input distribution. Such investments should be guided by careful cost/benefit analyses that take into account institutional capabilities as well as the dynamic effects on demand for processing, transport, and other marketing services.

Several participants stressed the effects of market reform in reducing transaction costs. The legalization of the private grain trade in Mali and elsewhere appears to have reduced marketing margins, reflecting lower risk premiums and greater scale economies in transport because it is no longer necessary to trade in small, undetectable lots (Staatz, Ahlers). And, reform appears to have benefitted rural consumers in Mali because grain is now readily available in local markets, eliminating the need to wait in queues at government warehouses for grain.

The general discussion of appropriate government roles in Sahelian cereals markets prompted one European participant to contend that much of the US analyses focus too narrowly on economic concerns to the detriment of multifaceted political and social issues, such as the desire to reduce dependence on imports, preserve consumption patterns, combat migration and create jobs in rural areas (Oomen). Because these politically sensitive

issues influence the behavior of Sahelian governments, ongoing policy dialogue with governments may be more successful if such issues are specifically considered in the formulation of a food strategy. The European Commission paper emphasized the continued need for direct public sector participation in grain markets to "ensure that the private sector does not abuse its (near) monopoly situation and, secondly, in order to act in those areas in which the private sector is not particularly interested or has only a limited ability to act (supplying marginal areas or vulnerable population groups, strategic stockpiling, etc.) and thirdly, to 'contain' the market, i.e., prevent price fluctuations from becoming too excessive" (EC Commission, 1988). Yet the empirical record over past decades questions whether the monopolies referred to above really do exist (Dione and Staatz, Shapiro and Berg).

#### **B. Facilitating Private Sector Performance in the Marketing System**

While the current pace of ongoing reform provides a unique opportunity to enhance food security, it is not sufficient to view market reform as simply getting governments out of food distribution and letting traditional markets work. The "vacuum theory of privatization", under which private traders are assumed to immediately fill the void left by state withdrawal from the market is not supported by ongoing research findings (Weber et al., Dione and Staatz, Goetz et al.). Many private cereals traders lack the resources, product knowledge and management skills to market improved inputs effectively in southeastern Senegal (Goetz et al.). Malian traders have complained that in spite of greater opportunities opened up by market reform, their ability to acquire trucks, warehouses and expand their operations has been hampered by inadequate working capital, financing, and market information (Dione and Staatz).

Given that markets in Africa operate under a number of complex constraints, not all of which are related to government policy, reforms based simply on liberalization of markets may be insufficient to catalyze private sector participation in the food system. Strategic public sector activities to promote private sector investment include market information dissemination, mechanisms to reduce risks and transaction costs in rural markets, research and diffusion of production and processing technology, improving

transportation infrastructure, and strengthening legal institutions. Empirical evidence in several African countries indicates that such investments combined with market reform also raise producers' ability to respond to price incentives (Jayne and Weber). Delgado concludes that "the primary issue in [elastic aggregate agricultural supply response] is identifying in an operational manner the best public investment strategy to pursue in order to speed up private capital accumulation in agriculture and growth in labor productivity. Such policies have favorable prices as a supportive component, but not as a major substitute for prioritized public investment."

Several "chicken and egg" cycles were identified that apparently impede the development of a vibrant private sector in input and output markets. In both Senegal and Burkina Faso, analysts noted that few marketable surpluses are produced because markets are thin and uncertain, but markets remain thin because few marketable surpluses are produced (Crawford, Reardon). This impedes private investment in the range of marketing services required to stimulate local cereals production. Also, a viable cereals processing industry depends on an adequate source of local supply, but the incentives to increase local supply depend on higher prices due to consumer demand, which is partly a function of processing characteristics (Crawford). Key public sector investments may be critical to break the gridlock and promote sustained investment and growth in the food system (Weber et al., Delgado).

### C. Trade Policy

Much of the policy dialogue among donors, and between donors and Sahelian governments, concerns the appropriate price relationships between domestic, regional and international markets, as well as the preferred mix of policy tools to achieve these relationships. The regional protected market proposal exemplifies this policy debate.

The desirability of driving a wedge between domestic and world rice prices, by a tariff on imported rice for example, was seriously questioned by the conference participants. First, rice appears to be very important in the diets of both the urban and rural poor. A tariff on rice would be tantamount to a regressive tax on the poor. Second, as discussed above, research results from Mali and Burkina Faso indicate that short-run demand

elasticities for rice appear quite low, as do cross-elasticities between rice and coarse grains (Lowdermilk, Rogers, Reardon). This suggests that higher rice prices would exacerbate both rural and urban food insecurity and confer little demand stimulus to locally produced coarse grains. The protected market proposal is weakened even further if coarse grains production is relatively unresponsive to price incentives (Martin).

In addition to questions of desirability, there are also problems of implementation. Given the particular consumption, production, social and political characteristics of each Sahelian country, agreement on and adherence to a common price alignment in a regional protected market could be difficult (Josserand).

Although existing empirical data present serious questions about the viability of a regional protected cereals market in the Sahel, market and trade policy must still deal with legitimate concerns that were the impetus behind the protected market proposal, specifically the desire to (a) stimulate demand for locally produced coarse grains that account for 90 percent of cultivated area in the Sahel, and (b) reduce dependence on imported cereals, especially rice.

Several alternatives were forwarded as means to meet these objectives: (1) currency devaluation, (2) non-price actions, such as improved processing or cooking techniques, which would raise the palatability of and demand for locally produced coarse grains, and (3) a flexible price policy environment consistent with import and export parity prices. Each of these alternatives is briefly discussed in turn.

A currency devaluation would accomplish the same end as a tariff in raising imported rice prices relative to coarse grain prices (Humphreys, Delgado). Unfortunately, it would have similar regressive effects on food insecurity among the heavily rice-consuming poor. Also, a devaluation would shift the terms of trade between all importables, exportables, and non-tradables, causing much broader effects throughout the economy than a tariff on a specific commodity. This may partially explain the reluctance of some donors and governments to advocate this option. Furthermore, in the absence of complementary investments in infrastructure, technology, and marketing institutions, a devaluation would probably be insufficient to stimulate local grain production (Delgado).

A second means of shifting consumption toward locally produced coarse grains is through changes in cooking preparation and processing that would make coarse grains cheaper, more convenient to cook, and more palatable to eat. This option requires future technological advances.

A flexible price policy that refrains from committing national resources to specific commodity sectors was advocated by some participants (Berg, Rogers), with the rationale that world economic conditions are so uncertain and ephemeral that comparative advantage cannot be predicted. Under such conditions, the appropriate relationship between domestic and world prices is parity, which allows private actors rather than policymakers to determine the sectors in which there will be investments and related changes in comparative advantage. This perspective neither provides nor advocates a policy mechanism to reduce dependence on imported cereals or shift consumption toward local coarse grains. Shapiro and Berg point out that the risks of depending on unstable international markets for food may be no greater than depending on unstable local production for food. Weather fluctuations make grain production in the Sahel highly variable. A shift to a greater self-supply simply shifts risk toward the variability of domestic cereal production and away from the combined variability of domestic groundnut, cotton, and livestock production and world prices for cereals and exports. "To the extent that the latter production and price movements are not closely correlated, reliance on them should be less risky than greater reliance on domestic cereal production" (Shapiro and Berg).

In either case, however, price instability and its effects on consumption and long-run investment may be severe. The frequency and severity of drought in the Sahel require marketing institutions flexible enough to deal with recurrent crises (von Braun). An important policy challenge is to develop workable rules that maintain consistency between domestic prices and long-run trends in world markets, while reducing price instability to encourage warranted investment in the food system and mitigate consumption variability (Staatz).

Although there was no consensus on whether to insulate domestic markets from world markets, there was broad agreement that freer trade within West Africa was advisable (Josserand, Berg, Lele). Coastal countries such as Ghana and Nigeria may provide an expanding market for Sahelian agricultural

exports. Niger's growing cowpea exports to Nigeria demonstrate the income-generating potential of intraregional trade (Josserand).

#### **D. Food Aid**

For better or worse, food aid appears here to stay for the foreseeable future (Hanrahan). Therefore, policies must be designed that constructively use aid to alleviate food insecurity among vulnerable groups without depressing production incentives or introducing instability into the market. Although the concept of self-targeted food aid (e.g., subsidies on goods mainly consumed by the poor) has been promoted in recent years, research results from Mali indicate that no cereal crop appears to be an inferior good, at least in the urban areas (Rogers and Lowdermilk). If these results are generalizable to wider areas in the Sahel, they create design problems for the efficient transfer of food aid to targeted groups.

Evidence from Burkina Faso indicates that in drought years, food insecurity may be more severe in major cereals production regions than in the more marginal northern areas. This is because income appears more linked to agricultural production in the high potential areas than in the north, where income sources are more diversified and less dependent on the weather. Consequently, the most useful criterion for allocating food aid within a country may be purchasing power shortfall, not agricultural production shortfall (Reardon, Matlon, and Delgado).

#### **E. Policy Dialogue and Strengthening Domestic Analytical Capacity**

Market restructuring is often carried out by African governments as a response to budgetary crises rather than an abiding belief in giving greater emphasis to private initiative in markets (Josserand and Casey, Wilcock, Delgado, Berg). Participants noted the use of "smoke and mirrors", in which mandated reforms are often accompanied by a myriad of informal measures to counteract the more politically sensitive aspects of reform.

Donors are somewhat unclear among themselves about the desirable path of policy reform. Berg concluded that donors cannot present clear recommendations because of differences of opinion between and within agencies on issues such as the appropriate role of parastatals, the usefulness of buffer stocks or input subsidies, and the utility of support prices. Timely,

policy-relevant research can contribute to a harmonization of views among donors by clarifying how households and markets work in Africa. Yet the root cause of important policy disagreements often concern questions of values as well as facts, such as the relative weights to be put on equity and efficiency in policy formation.

Greater attention in the future to policy interaction between researchers, donors, and governments may reduce the gap between intended and actual implementation of reforms. For example, the timely dissemination of price and transactions information, while instrumental in improving the efficiency of grain markets in the Sahel, may be even more valuable in its ability to raise the level of discussion between donors and governments (Loveridge and Weber). Throughout Africa, the policy dialogue between donors and governments has been impeded by failure to institutionalize sustainable local policy formulation and evaluation. Yet effective interaction between researchers and government officials, based on timely sharing and discussion of ongoing research findings, can create the demand for policy analysis that upgrades the empirical quality of policy deliberations. Building effective demand for policy research requires an iterative program of research and policy extension (Weber et al., 1988). Moreover, efforts to expand the supply of trained local analysts may contribute to the development of effective demand for policy-relevant research, as it helps build a lobby within government for such research (Weber et al.). Lele argues that an important element in agricultural development in Asia was the nurturing of trained professionals and government officials who could articulate a food strategy and resist donor faddism (Lele, 1981). A development approach that treats policy extension, research, and local human capital formation as joint products can simultaneously raise the domestic supply of and demand for research and analytical capacity, thereby elevating the level of policy dialogue between donors, researchers, and governments.

## PRESENTATIONS

- Ahlers, T. "The Structure of Cereals Demand": Discussion
- Batchelder, A. "Consistencies, Inconsistencies, and Impacts of Donor Agricultural and Food Policy Recommendations to Date": Discussion
- Berg, E. "Consistencies, Inconsistencies, and Impacts of Donor Agricultural and Food Policy Recommendations to Date"
- Crawford, E. "The Structure of Cereals Demand: Senegal Consumption Case Study"
- Grayzel, J. "Implications for Future Donor Thinking": Discussion
- Hanrahan, C. "Food Security and Agricultural Development in the Sahel: The Role for Domestic Cereals Production": Discussion
- Humphreys, C. "Appropriate Agricultural Research Strategies": Discussion.
- Jepson, L. "Implications for Future Donor Thinking: A Proposed U.S. Position"
- Lallement, D. "The Scope for Price Policy to Slow Down the Consumption of Imported Cereals and to Promote Agricultural Growth in West Africa": Discussion
- Lele, U. "Building Domestic Research and Analytical Capacity, and the Continuity of Policy: Implications for Future Donor Thinking."
- Lewis, B. "Implications for Future Donor Thinking: Political Constraints"
- Lowdermilk, M. "The Structure of Cereals Demand: Mali Consumption Case Study"
- Missiaen, M. "The Structure of Cereals Demand": Discussion
- Oomen, A. "A European Perspective on Donor Policy Considerations."
- Reintsma, C. "The Structure of Cereals Demand": Discussion
- Rogers, B. "Implications for Future Donor Thinking: Distributional Impacts"
- Steele, G. "Production Incentives": Discussion.
- von Braun, J. "The Structure of Cereals Demand: Gambia Consumption Case Study"
- Wilcock, D. "Cereals Policy Reform in Niger": Discussion

## ANNEX A: LIST OF PARTICIPANTS

### A.I.D. - Africa Bureau

Larry Saiers	DAA/AFR, Rm. 6942 NS
Roger Simmons	AFR/SWA, Rm. 3491 NS
John Westley	AFR/DP, Rm. 3913 NS
Abbe Fessenden	AFR/CCWA, Rm. 2664 NS
Kenneth Swanberg	AFR/MDI, Rm. 4527A NS
Colette Cowey	AFR/DP/PAR, Rm. 3909 NS
Jerry Wolgin	AFR/DP/PAR, Rm. 3909 NS
Lenne Rosenberg	AFR/DP/PAR, Rm. 3909 NS
Emmy Simmons	AFR/DP/PPE, Rm. 3911 NS
Patricia Rader	AFR/DP/PPE, Rm. 3911 NS
Nancy McKay	AFR/PD/SWAP, Rm. 2733 NS
Curt Reintzma	AFR/PD/SWAP, Rm. 2733 NS
Gloria Steele	AFR/TR/ANR, Rm. 2941 NS
Lance Jepson	AFR/TR/ANR, Rm. 2941 NS
Bernard Lane	AFR/TR/PRO, Rm. 2943 NS

### A.I.D. - Other

Sam LaFoy	FVA/FFP/AFR, Rm. 417 SA-8
Jerry Manarolla	FVA/FFP/AFR, Rm. 417 SA-8
Jim Mudge	PPC/EA, Rm. 3673 NS
Alan Batchelder	PPC/EA, Rm. 3947 NS
Melanie Marlett	PPC/PDPR, Rm. 3894 NS
Joan Atherton	PPC/PDPR, Rm. 3894 NS
Eric Chetwynd	ST/RD, Rm. 608C SA-18
Michael Yates	ST/RD/RRD, Rm. 622 SA-18
John Grayzel	ST/RD/RRD, Rm. 608C SA-18
Thomas Mehen	ST/RD/DA, Rm. 606D SA-18
Patricia O'Brien-Place	ST/N, Rm. 413E SA-18
Wendell Morse	BIFAD, Rm. 5314A NS

### U.S.D.A.

Margaret Missiaen	1301 New York Ave. NW USDA/ERS/ATAD, Rm. 734 Wash. D.C. 20005-4788
-------------------	--

### Library of Congress

Charles Hanrahan	Congressional Research Service Room LM423 Wash. D.C. 20540
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World Bank

Ted Ahlers	AF5/CO, Rm. J6166
Charles Humphreys	AFT/TF, Rm. B10-027
Dominique Lallement	AF5/AG, Rm. J6259
Uma Lele	CECSS, Rm. N8035
Josette Murphy	AFT/AG, Rm. J9030
John Peberdy	AFT/AG, Rm. J6031
Chantal DeJou	YP, Rm. B8031

IFPRI

1776 Mass Ave., NW, Ste. 4  
Washington, D.C. 20036

Chris Delgado  
Tom Reardon  
Joachim von Braun

Michigan State University

Dept. of Agricultural Economics  
202 Agriculture Hall  
East Lansing, MI 48824

Eric Crawford  
Carl Eicher  
Thom Jayne  
Nicholas Minot  
Jim Shaffer  
John Staatz  
Mike Weber

Tufts University

School of Nutrition  
126 Curtis St.  
Medford, MA 02155

Melanie Lowdermilk  
Beatrice Rogers

Elliot Berg Associates

907 Duke St.  
Alexandria, VA 22314

Elliot Berg

Abt Associates

4250 Connecticut Ave., NW.  
Washington, D.C. 20008

John Holtzman  
Gerard Martin  
Richard Abbot  
Mark Newman

Development Alternatives Inc.

624 Ninth St., NW.  
Washington, D.C. 20001

Dave Wilcock

Rutgers University

252 Lincoln Ave.  
Highland, NJ 08904

Barbara Lewis

University of Wisconsin 240 Agriculture Hall  
 Dean, International Programs  
 Kenneth Shapiro Madison, WI 53700

Cornell University

Sarah Lynch  
 David Sahn

Robert R. Nathan Associates 1301 Pennsylvania Ave., NW  
 Washington, D.C. 20004

Laura Bailey

Instituto Africano Rome, Italy

Vincenzo Caputo

Universite Laval Department of Agricultural Economics  
 Quebec, Canada G1K7P4

Frederik Martin

Dutch Government Ministry of Foreign Affairs  
 DST/TA

Ad Oomen  
 Beth Johnson The Hague, Netherlands

Resources for the Future

Carol Kramer

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