

PN ABT 262

AGENCY FOR INTERNATIONAL DEVELOPMENT PPC/CDIE/DI REPORT PROCESSING FORM

ENTER INFORMATION ONLY IF NOT INCLUDED ON COVER OR TITLE PAGE OF DOCUMENT

1. Project/ Subproject Number

936-5459

2. Contract/Grant Number

DAN-1190-A-00-4092-00

3. Publication Date

October 1989

4. Document Title/Translated Title

Policy Dialogue, Market Reform and Food Security in Mali and the Sahel

5. Author(s)

1.
2.
3.

6. Contributing Organization(s)

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7. Pagination

23 p.

8. Report Number

9. Sponsoring A.I.D. Office

AFR/Office for Sahel West Africa G/EG/EID/RAD USAID/Bamako

10. Abstract (optional - 250 word limit)

11. Subject Keywords (optional)

1. Sahel 4. food security
2. Mali 5.
3. market 6.
liberalization

12. Supplementary Notes

Published in M. Rukuni, G. Mudimu and T.S. Jayne, eds., *Food Security Policies in the SADCC Region, proceedings of the Fifth Annual Conference on Food Security Research in Southern Africa, 16-18 October 1989*, pp. 143-170. Harare: UZ/MSU Food Security Research Project, Dept. of Ag. Economics and Extension

13. Submitting Official

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14. Telephone Number

517-353 8639

15. Today's Date

September 6, 1994

-----DO NOT write below this line-----

16. DOCID

17. Document Disposition

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POLICY DIALOGUE, MARKET REFORM AND FOOD SECURITY IN MALI AND THE SAHEL

Josué Dioné

1. INTRODUCTION

The food crisis has been particularly severe in the semi-arid Sahelian countries of West Africa, a region encompassing nine countries and some 38 million people.¹ To combat the crisis, donors have poured an unprecedented U.S. \$15 billion of aid over the past 13 years (1975-88) (de Lattre, 1988).

Many analysts have concluded that, besides the lingering effects of the prolonged drought of the early 1970s, poorly designed pricing and marketing policies have distorted agricultural incentives and failed to address the major causes the food production gap in the Sahel. In the late 1970s, many donors pressed for policy reforms to restore farmers' and private traders' incentives to invest in order to increase the production and improve the distribution of food. For example, under strong pressure from donors, the government of Mali agreed in March 1981 to carry out a policy reform aimed at increasing official producer and consumer prices, liberalizing grain trade and improving the efficiency of OPAM, the state grain board. Moreover, the scope of the policy debate has been broadened since 1986 to include concerns about foodgrain trade liberalization in the Sahel or the entire region of West Africa (Club du Sahel, 1987).

This paper analyzes the impact of the process of market liberalization on food security in Mali in particular and the Sahel in general. Based on the central thesis that output market liberalization is a necessary by not a sufficient condition to improving food security in the Sahel, the paper focusses on the interactive effects of technology, institutions and policy reforms on food availability and access to food.

The remainder of the paper is divided in five sections. The first section highlights the food-security problems in the Sahel in general. The second section presents an overview of the evolution of food and agricultural policy in Mali from 1928 to date. The third section discusses the objectives, implementation and achievements of the cereal market liberalization process in Mali, and some of the major issues for the 1990s. The fourth section examines some of the major issues of regional cereal trade liberalization. The last section draws some policy implications for food security in the Sahel.

2. FOOD-SECURITY PROBLEMS IN THE SAHEL

The attention of the entire world was captivated by news of hundreds of thousands people dying from hunger and suffering from starvation during the prolonged drought of the early 1970s in the Sahel, which was stricken again by a severe drought in the early

¹. The Sahelian countries include Burkina Faso, Cape Verde, the Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, and Chad.

1980s. The international donor community responded generously, yet the food production gap continued to widen. The bulk of donors' aid was not directed at improving domestic productivity in the major food crops, for which capita production declined.²

Following the disappointing performance of crop-production projects and integrated rural development projects of the 1960s and 1970s, donors' attention has shifted in the 1980s to policy reforms in the general framework of structural adjustment lending programs throughout sub-Saharan Africa. Pricing and marketing policies, which traditionally subsidized consumers by depressing producer prices and accumulating budget deficits of the state grain boards, were perceived as major impediments to food security. Output price and market liberalization have therefore been selected as means to restore farmers' and traders' incentives to invest and increase the production and improve the distribution of the basic food staples (particularly cereals).

Food insecurity in the Sahel, however, stems from a complex set of problems which cannot be solved by price and marketing reforms alone (Eicher, 1982; Eicher, 1988). There are five fundamental causes of food insecurity in the Sahel.

First, the overarching cause of food insecurity in the Sahel is poverty (Sen, 1981). With per capita GNPs ranging between US \$160 and US \$260, five Sahelian countries were among the 16 poorest nations in the world in 1987. All Sahelian countries were among the world's 43 poorest countries (World Bank, 1989). Between 1965 and 1986, the average annual growth rate of per capita GNP was positive but less than 1.5% in four of the nine countries and negative in the other five countries. Although the bulk of the population still lives in the rural area and is engaged in agriculture, over one-fourth of the Sahelians experience what Professor Sen (1988) calls a "pull failure" in their food entitlements, i.e., inadequate access to food because of the low level of their real incomes. Failures in effective demand affect both the urban poor and food-deficit rural people (non-farmers as well as farmers), thus compounding constraints on the supply-side of the Sahelian food-security equation.

Second, most Sahelian countries lack appropriate agricultural technology that farmers can readily adopt to expand and stabilize the production of rainfed cereals (millet, sorghum and maize), which account for about 80% of total foodgrain consumption in the sub-region. As a result of a heavy concentration on export crops (groundnuts and cotton), neither during the colonial period nor over the nearly thirty years of independence have strong national research institutions evolved to improve yields and stabilize the output of rainfed cereals in the Sahel. Today, there are no widespread high-yielding and drought and disease-resistant varieties for rainfed cereals.³ Growth in

². For instance, de Lattre (1988) reports that of the total aid received by the Sahel, not much more than 25% was allocated to productive investment, and only 4% was devoted to improving productivity in rainfed food crops. Delgado and Miller (1984) estimate that per capita production of foodgrain in the Sahel declined annually between 1961-65 and 1976-80 by 2% for millet, 1.3% for sorghum, 3% for maize and 1.4% for rice.

³. In a few cases, some of the research on export crops has benefitted food crops. For instance, since cotton and sorghum are often grown in rotation, the fertilizer residual from cotton is of benefit to sorghum the following year.

aggregate food supply from domestic production will most likely be limited as long as there are no viable technological options to increase and sustain productivity in the major rainfed cereals.

Third, the capacity of farmers in the Sahel to finance investments in agriculture is undermined by various agricultural surplus extraction strategies, including taxation of crop and livestock production and exports, overvaluation of exchange rates, and head taxes that are levied on some categories of the rural population. The composite effect of the tax burden is not offset by subsidized government credit programs. Hence, the supply response to higher grain prices is low.

Fourth, of course, severe imperfections in labor markets, farm input supply markets, financial markets and foodgrain markets are serious impediments to both improved availability of, and access to, food in the Sahel. Given the interactions among these different markets, their imperfections also have interactive effects on food availability (through production) and accessibility (through real income). Without a comprehensive view of market-related problems, the scope of actions undertaken to improve the efficiency in only one type of markets (e.g., cereal markets) will be constrained by prevailing imperfections in the other markets.

Fifth, rapid urbanization is contributing to a shift in consumption patterns away from domestic production structures, hence to developing an unsustainable food-consumption profile throughout West Africa and the Sahel. Both price and non-price factors stimulate an orientation of urban-consumption preferences towards relatively cheap imports of two "fast-food type" commodities: rice (mainly from Asia) and wheat. With an annual urban population growth rate of about 7%, per capita consumption of rice and wheat products in the Sahel rose by 29% between 1966-70 and 1976-80, while that of coarse grains (millet, sorghum and maize) fell by 12% (Delgado and Miller, 1984). Such a consumption profile is unsustainable because there is little hope in the medium term that domestic supply will respond adequately to the growing demand of rice and wheat. Moreover, the Sahelian countries' capacity to earn foreign exchange for grain imports is restricted⁴ by their declining competitiveness, particularly in the world oilseed-product markets.

3. EVOLUTION OF FOOD AND AGRICULTURAL POLICY IN MALI

With an estimated per capita GNP of U.S. \$210 in 1987, Mali ranked as the twelfth poorest nation of the World (World Bank, 1989). Mali is landlocked in the semi-arid Sahel and Sahara desert in West Africa. About 80% of the population live in rural areas,

⁴ There are no heat-tolerant wheat varieties and no improved rainfed rice varieties in the Sahel. Moreover, Berg (1989) shows that in spite of a 50% increase in world rice prices in 1988, the cost of rice produced under irrigation in the largest rice-consuming country of the Sahel (Senegal) amounted to 2.3-3.6 times the average landed price of broken rice imported from Thailand. While the Sahel's imports of rice and wheat products continue to grow by nearly 8% per year, FAO trade data indicate that its exports of groundnut products fell by 67% in quantity and 69% in value between 1976 and 1986 (Delgado and Miller (1984)).

subsisting essentially from rainfed agriculture and livestock production. The entire economy of the country rests on the rural sector, which provides the bulk of employment, food (essentially cereals), and foreign exchange (cotton, livestock and fish). Cereals provide approximately 70% of the total caloric consumption of Malians, and coarse grains (millet, sorghum and maize) account for 85% of this proportion. Mali appears as the Sahelian country with the best endowment in land suited for both rainfed and irrigated agriculture. In spite of this relative abundance in land, Mali's agriculture has, just as in other Sahelian countries, progressively failed to produce enough foodgrain for a population growing at 2.5% per year.

The agricultural and food policy options followed by Mali after independence in 1960 were strongly determined by the 1928-1959 colonial policy legacy in French Sudan. The French colonial policy in this country aimed at expanding the production of export crops needed by the French industry (Jones, 1976, pp. 20-23). Groundnut production was successfully spread mainly because of the similarity of this crop to the local varieties of groundnuts grown for centuries in the region. Success in developing cotton production was much slower, as the first attempt to grow cotton under irrigation failed (Amin, 1965; de Wilde 1967); Jones 1976).⁵ Cotton production took off in Mali only after 1949, with the interventions of the Compagnie Française de Développement des Textiles (CFDT) in high-potential rainfed areas of the country.

Agricultural research efforts were consequently concentrated on developing improved seeds, fertilizers, pesticides and farming techniques for cash crops. The production of these crops grew particularly from the extension of cultivated land through the spread of animal traction and from the introduction of crop rotations, which included cotton, coarse grains (especially sorghum), and groundnuts. No significant research program was undertaken to improve food production per se. Instead of market incentives, head taxes and village-level quotas of cash-crop delivery were established as means to increase market surplus. All important marketing activities were entrusted to French commercial companies holding monopoly rights and to Lebanese traders, leaving only subsidiary assembly roles to domestic merchants.

Guided by an inherited anti-market/anti-merchant bias, misconception of the agricultural incentive system, and a high propensity for state interventionism and monopoly, the leaders of Mali opted at independence for a radical socialist development path, which lasted from 1960 to 1968. Central planning was adopted and initiated with French technical assistance, as the best way to achieve economic independence through rapid development of agriculture, industrialization for agricultural input manufacturing and product processing, the systematic search for oil and mineral resources, and the implementation of mass-oriented social policies in education, health, administration, etc. (Amin, 1965; Jones, 1976; Bingen, 1985). A total of 33 state enterprises were created between 1960 and 1968 to undertake or control virtually all the major economic activities, including agricultural input and credit distribution, product processing, domestic marketing, and exports.

⁵. The Office du Niger project had the objective of irrigating 1.2 million hectares in the central delta of the Niger River in order to create the "bread basket" of French colonial West Africa and to substitute for U.S. sources in supplying raw cotton to the French textile industry.

Agricultural and food policy was dominated by attempts to develop rice production under irrigation, implementation of crash-production projects in rainfed areas, collectivization of production, and compulsory marketing through the Office des Produits Agricoles du Mali (OPAM), a state grain board created in 1964, with legal monopoly in agricultural product marketing. Yet merchants continued to trade grain clandestinely on the private parallel market. Official consumer and producer prices for all major commodities were fixed by the state with the three conflicting objectives of (1) increasing rural incomes, (2) providing cheap food (cereals) to urban consumers, and (3) extracting a surplus from agriculture to finance state investment in other economic sectors (Dioné and Staatz, 1988). In reality, the last two objectives took priority, resulting in depressed official producer prices, the imposition on farmers of delivery quotas of cereals to OPAM, and subsidization of consumers through urban consumer cooperatives, at the expense of accumulating OPAM deficits.

The philosophy underlying agricultural development and food policy remained essentially unchanged over the first two decades of Mali's independence. But there was a shift in the 1970s, with strong donor support, from commodity-based projects to integrated rural development programs. By 1981, these programs were managed by 26 public-sector agencies called Opérations de Développement Rural (ODRs), in charge of agricultural extension, input and credit distribution, and output marketing (SATEC, 1982). Except for cotton, basic investment in agricultural research and rural infrastructure remained insignificant.

In summary, aggregate food production in Mali stagnated in the 1960s and 1970s. The relative stagnation of food production resulted in Mali shifting from being a net cereal exporter in the 1950s and early 1960s to becoming a net importer of increasing quantities of foodgrain after 1965. This deterioration in the country's food situation and the prolonged Sahelian drought of the late 1960s and early 1970s led to Mali's food crisis.

4. THE CEREAL MARKET LIBERALIZATION

Official producer prices of cereals were raised after the end of the 1968-74 drought to stimulate domestic production. OPAM was mandated to sell foodgrain from both domestic supply and commercial imports at official consumer prices set below the full cost of the cereals. The resulting consumer subsidies translated into increasing OPAM budget deficit, which accumulated to about U.S. \$80 million by 1976/77 (Humphreys, 1986, p. 7). Donor concerns grew in the 1970s about OPAM's mismanagement and accumulating deficits, and the perception that OPAM's legal monopoly in grain marketing and the official price system acted as major disincentives to domestic cereal production (de Meel, 1978). The resulting donor pressure led to the Cereal Market Restructuring Program (PRMC by its French acronym), to which the government of Mali agreed in March 1981. A group of 10 major donors entered collectively into a policy dialogue with the government of Mali and pledged multi-year shipments of food aid in exchange for a major overhaul of cereals marketing policy.⁶

⁶. These donors were the World Food Program (which acted as secretariat of the program), Austria, Belgium, Canada, the European Community, France, Great Britain, the Netherlands, the United States, and West Germany.

(a) Objectives

Initially designed for the six-year period of 1981/82-1986/87, the PRMC aimed explicitly at:

- (1) raising farmers' income through a gradual increase in official producer prices of cereals;
- (2) liberalizing cereal trade through the elimination of OPAM's official monopoly and increased private trader participation; and
- (3) improving OPAM's operating efficiency through the restructuring of this marketing parastatal (Dioné and Dembélé, 1987, pp. 8-9).

The program was to be financed by reflow money from sales of PRMC-related food aid.

The PRMC objectives and funding mechanisms proceeded, in the absence of adequate empirical information about the structure and conduct of domestic cereal production and marketing, from the implicit assumptions that:

- (i) actual prices received by farmers were highly correlated with official producer prices, which significantly affected coarse grain production;
- (ii) farmers constituted an homogenous group of net sellers of cereals, who would benefit from higher foodgrain prices;
- (iii) no major constraints other than price disincentives hindered farmers' marginal propensity to invest in cereal production;
- (iv) private traders had the capacity and propensity to invest in response to new opportunities opened up by market liberalization;
- (v) Mali would continue to experience cereal deficits, and to thus need food aid to support market liberalization;
- (vi) OPAM should continue to exist to channel food aid and protect its politically influential clientele from higher grain prices.

Because most of these assumptions were found by research to be inaccurate, several adjustments were made in the cereal market liberalization program, which was extended for three additional years in 1987.

⁷. Dioné and Staatz (1988), Staatz, Dioné and Dembélé (1989), and Dioné (1989) give more details on the objectives and the implicit assumptions of the cereal market liberalization program in Mali.

(b) Implementation of the Cereal Market Liberalization: 1981-89

This section assesses the achievements of the program with respect to foodgrain production, private grain marketing, and the state grain board (OPAM).

Foodgrain production

One of the major goals of the cereal market liberalization program was to raise farmers' incomes and incentives to produce more cereals for the market. Yet foodgrain production in Mali has continued to be influenced more by rainfall than any other factor. An empirical study of farmers from 1985 to 1987 reveals that neither "getting prices right" nor producer floor prices are simple solutions to food insecurity problems in Mali (Dioné, 1989a). First, severe liquidity problems restricted the ability of the government to sustain producer price supports through buffer-stock operations of the state grain board, as will be discussed later.

Second, research has raised serious concerns about the equity implications of increased cereal prices, even at the farmers' level.⁸ Even following the two relatively abundant harvests of 1985 and 1986, up to 43% of the farm households of two of the best agricultural zones of Mali (CMDT and OHV) were net grain buyers (Table 1). These results are striking in that Mali is generally perceived as having a fairly equalitarian distribution of land. Only 53% of the survey farms were net grain sellers, and 90% of the total quantity of net sales came from only 28% of the sample farms. These were essentially farm households located in the more humid southern part of the CMDT zone, with good access to improved farming techniques through relatively efficient systems of agricultural research, extension, input supply and credit, and heavily engaged in cotton production.

This clearly illustrates the equity issue of what Timmer, Falcon and Pearson (1983) have termed "the food-price dilemma". In the short run, higher cereal prices would mainly benefit fewer than a third of the farm households, while depressing the real income of at least 40% of them which are net foodgrain buyers. In fact, market demand for grain other than rice in Mali is essentially located in the rural areas (among non-farmers as well as a large number of food-deficit farmers), since millet, sorghum and maize account for less than 45% of the total cereal consumption of the 20% of Mali's total population living in urban areas (Rogers and Lowdermilk, 1988). Given the generally low supply elasticity for food in the context of poor technology, infrastructure and institutions in developing countries such as Mali, higher producer prices need a long gestation period and substantial complementary investment in research, extension and other supporting services before they induce any significant effect on foodgrain availability and the real incomes of the rural poor.⁹

⁸. Because of the lack of data on the clandestine private system which, in most years, handled over 70 percent of the estimated total quantity of coarse grains traded prior to cereal market liberalization, it is impossible to quantify rigorously the effect of the PRMC on actual producer prices.

⁹. Various authors' report estimates of the price elasticity of agricultural supply, which typically range from 0.2 to 0.7 in most developing countries, including sub-Saharan

Table 1. Farmers' Production, Market-Transactions and Net per Capita Availability of Coarse Grains by Rural Development Zone, Agro-Climatic Subzone, and Level of Animal Traction Equipment, CMDT and OHV, Mali (1985/86-1986/87)

Zones/Subzones and Level of Animal Traction Equipment	Production		Percent. Farms		Net Sales		Net Grain Available per Capita (kg)
	Kg per Capita	Over 188kg per Capita (% Farms)	Net Sellers	Net Buyers	Kg per Farm	Kg per Capita	
South CMDT *	405	86	75	18	502	44	341
North CMDT	299	81	59	38	-9	-1	286
South OHV *	149	25	36	59	-103	-8	151
North OHV	108	27	15	83	-510	-42	146
Total CMDT	345	84	67	28	244	19	310
Total OHV	128	26	25	72	-319	-25	148
Total South **	314	66	62	31	306	26	273
Total North **	238	62	44	54	-184	-14	241
Total Sample							
Equipped Farms	322	83	77	19	290	16	290
Semi-equipped	240	63	45	52	-11	-1	230
Non-equipped	186	44	32	62	-153	-21	201
Total	273	64	53	43	54	4	256

* CMDT is the largest cotton-producing zone; OHV is a zone with a similar agricultural potential but without significant cotton production.

** The south of each zone has higher rainfall and better agricultural land than the north.

Source: Dioné (1989a, 1989c).

Third, adequate attention has yet to be paid to interactions between pricing and marketing policies and policies in other areas (especially fiscal policies), which jeopardize farmers' food security in the short run and impede their capacity to invest and sustain capital formation in agriculture. For instance, in one of our 1985-87 survey zones (OHV), 37% of the farmer households in 1985/86 and 25% of them in 1986/87 sold coarse grains without producing any real surplus beyond home-consumption requirements (Table 2). In this zone, over half of the total grain sales were made at low prices during the first three months following harvest, and 71% of the grain sellers reported head tax payment as the most important motive for their sales (Table 3; Figure 1). About 72% of the farm households of the same region had to buy back cereals later in the year at higher prices than those at which they sold at harvest, often using very costly coping strategies (e.g., cereal loans to be paid at next harvest, migration, and sale of family labor during the cropping season). Moreover, indirect farmer taxation through official cash-crop price schedules and head taxes compound farmers' weak self-financing capacity. Restricted access to official credit further limits farmers' capacity to maintain their investments.¹⁰ Thus, about two-thirds of the OHV survey-farmers who had historically invested in animal traction had also disinvested from it to generate cash to face both household food shortages and head tax payments in years of poor harvests (Dioné, 1989).

Fourth, the search for increased foodgrain production and accessibility in Mali has overlooked important synergies among cash crops and food crops. These synergies and differences in the performance of agricultural support institutions may lead to considerable gaps in productivity and growth between regions with similar agricultural potential. Our 1985-87 survey found that, relative to other zones, higher agricultural growth was achieved in the CMDT cotton-zone through a strategy centered on a vertically coordinated set of activities (research, extension, input and credit distribution, processing and marketing, and investment in road infrastructure) for the long-term growth of cotton production and income. Cotton income not only covered farmers' fixed cash liabilities (taxes and loans), but also gradually supported the development of food production and nonfarm activities. The CMDT cotton-farmers also produced on average 2.7 times as much coarse grains per capita as those in OHV, a zone with similar agricultural potential (Table 1). After net outflows amounting to 10% of their own production, the farm households in the cotton zone still had enough coarse grains to meet their home-consumption needs (at 188 kg per capita per year) at least a full year beyond the two years of the survey. By contrast the farms in the non-cotton zone could barely meet their family foodgrain needs in spite of purchasing the equivalent to 16% of their own production.

To summarize, there is more to improving food security at both the national and the farm-household levels in Mali than just improving grain pricing and marketing. In Professor Sen's terms, the "endowment bundles" and the "exchange entitlement mappings" are so interdependent in Mali that improving long-term access to food is almost synonymous with improving food and agricultural production.

¹⁰. Estimated rates of implicit farmer taxation through official price schedules in the 1970s range from 24% to 61% for cotton and 48-65% for groundnuts (SATEC (1982)).

Table 2. Percentage of Farm Households Selling Coarse Grains Without Surplus Production, CMDT and OHV (1985-1987)

ZONES SUBZONES AND LEVEL OF EQUIPEMENT	PERCENTAGE OF FARM HOUSEHOLDS		PERCENTAGE OF COARSE GRAIN SELLERS	
	1985/86	1986/87	1985/86	1986/87
CMDT	24	4	36	6
OHV	37	25	74	72
SOUTH	27	14	41	27
NORTH	33	19	55	29
EQUIPPED	24	7	31	8
SEMI-EQUIPPED	30	18	49	35
NON-EQUIPPED	31	18	67	43
TOTAL	30	16	48	28

Source: Dioné (1989c).

Table 3. Percentage of Coarse Grain Sellers by Most Important Sales Motive, CMDT et OHV, Mali (1985/86-1986/87)

SUBZONES	FOOD CONDI- MENTS	PAYMENT OF TAXES	PAYMENT OF DEBTS	EQUIP- MENT	HIRED LABOR	SOCIAL EVENTS
SOUTH CMDT	76.1	12.0	12.0	0.0	0.0	0.0
NORTH CMDT	84.3	0.0	4.1	7.4	0.0	4.1
SOUTH OHV	30.7	51.3	18.0	0.0	0.0	0.0
NORTH OHV	3.4	91.6	5.0	0.0	0.0	0.0

Source: Dioné (1989a).

Mali still has to face the central issue of significantly raising the productivity of the agricultural sector. This requires that careful attention be paid to policies in other areas (agricultural research, extension, financing, taxation, employment generation, etc.), which have significant effects on the opportunities and capacity to invest in agricultural production. It also requires a comprehensive strategy aimed at real income growth in agriculture through the development of improved policies and institutions, technology adoption and capital formation.

Private foodgrain marketing

From 1981 to 1986, the following government measures were introduced to improve the capacity of firms to market cereals: the abolition of the monopoly position of the government grain board (OPAM), the legalization of the private grain trade, and the removal of restrictions on interregional cereal trade prior to 1981. In fact, the abolition of OPAM's legal monopoly was more symbolic than real because the share of OPAM's grain marketing exceeded 5% of total domestic production and one-third of the estimated total quantities traded in only 3 of the 11 years prior to the beginning of the reform in 1981 (Dioné and Dembélé, 1987).

The legal action taken to promote private cereal trade nevertheless opened the door to new traders, who accounted for 39% of the 118 coarse grain wholesalers operating in four major cities in 1985. This led to some increase in specialization and scale of operations by longtime grain traders (Mehta, 1989). Hence, most consumers, including food-deficit farmers (who previously had no access to OPAM's subsidized supplies), have benefited from cost-savings resulting from freer circulation of grain and larger-scale operations of grain merchants induced by the cereal market liberalization (D'Agostino, 1988).

The inability to support producer prices through the buffer-stock operations of the government grain board led the market reform program in 1987 to launch, with donor support, a seasonal grain-trade credit program aimed at enabling private traders and farmer organizations to buy more foodgrain in the post-harvest period and assume seasonal storage of cereals. This program has encountered several problems, including the complexity of loan procedures, the unwillingness of traders to keep large grain stocks as a loan guarantee, poor access to loans for those who lack political influence within the Chamber of Commerce, and poor loan repayment records of the politically influential members of the Chamber of Commerce.¹¹ In addition, several design problems remained to be solved to allow the credit program to protect food-deficit rural households through the financing of cereals banks at the level of village associations, while safeguarding incentives for surplus grain-producer participation in the program (D'Agostino, Staatz and Weber, 1989).

Even a significant improvement of this seasonal credit program would leave several problems of the foodgrain distribution system unsolved, however (Table 4).¹² First, private traders still lack access to bank financing for long-term investment in transportation and storage facilities. Second, very little basic investment has been made

¹¹. Donors contribute funds to the seasonal credit program, which is administered through commercial banks and the Chamber of Commerce.

¹². See Dioné (1989a) and Mehta (1989) for details on the major constraints on the private grain trade.

to improve road infrastructure and facilitate grain transfer between surplus and deficit areas. Third, the government continues to show a high propensity to control private traders' operations tightly and foodgrain exports even following good harvests. These controls and regulation apply to trader registration, minimum stock-levels, information about suppliers and clients, export authorization, etc.. Such restrictive conditions and high business taxes impedes flexibility and overt competition in private grain trade.¹³ Fourth, a generalized liquidity crisis, which grew worse under a continuous government fiscal crisis, results in an increasing reluctance of private traders -- who usually play also the role of informal bankers -- to extend additional credit in cereals to increasingly insolvent civil servants, whose food security is more and more at stake.

Finally, private grain traders are chronically subjected to unstable expectations caused by several risk factors (Table 4). In the context of the thin and volatile cereal markets in Mali,¹⁴ these factors include:

- (i) uncertainty about supply from domestic production which, can be halved or doubled from one year to the next because of the vagaries of the weather;
- (ii) demand uncertainty resulting from the combination of unforeseen interventions of the public marketing system (OPAM) and food aid distributors, and the weakness and instability of consumers' real income;
- (iii) uncertainty about official cereal marketing and trade policies and regulations, which change constantly without prior consultation with, or notification to, private-sector participants; and
- (iv) the absence of appropriate measures to induce the development of forward planning through enforceable contracting mechanisms.

These different kinds of risk contribute to inducing private traders to adopt short-run, small-scale, and diversified trading strategies, which do not allow the whole food production and distribution system to benefit from all potential economies of larger scale operations.

OPAM: The state grain board

The public sector received 92% of total PRMC food aid reflow funds (about U.S. \$41 million) used over the first six years of the cereal market reform program (Table 6). OPAM alone received, in addition to considerable donor technical assistance, 72.5% of this share of the public sector. This paradoxical outcome of the food aid program, which aimed primarily at increasing private-sector participation in foodgrain marketing,

¹³. Since most traders are illiterate and do not hold formal accounts, business taxes are based on "guesstimates" of profits by agents of the ministry of finance. These estimated profits are taxed at 50 percent for companies and 30 percent for enterprises not set up as companies (Stryker et al., 1987).

¹⁴. The coefficient of variation of both producer and wholesale prices of coarse grains ranged, depending on the region, from 18 percent to 27 percent between November 1985 and October 1987 (Dioné (1989), p. 326).

Table 5. Wholesalers' Perceptions of Major Constraints to Private Coarse Grain Trade (percentage of sample wholesalers)

CONSTRAINTS	KOUTIALA	SIKASSO	BAMAKO	MOPTI	TOTAL
Limited Financing	22.2	25.0	35.0	94.7	50.0
High Business Taxes	33.3	75.0	30.0	63.3	50.0
Transport Costs/Means	33.3	8.3	10.0	5.3	11.7
Supply Uncertainty	77.8	60.0	7.6	47.0	41.1
Demand Uncertainty	0.0	10.0	30.7	82.4	38.3
Licensing/Administrative Procedures	0.0	0.0	15.4	0.0	5.1
Public Inspection/Fines	44.4	16.6	25.0	15.9	23.3
Traders Reporting Fines	55.6	58.3	70.0	84.2	70.0
<u>CONTRACTING:</u>					
Purchase Contracts	88.9	30.0	34.6	52.8	46.8
Oral contracts only	50.0	100.0	77.8	44.4	62.1
Violation of terms	62.5	33.3	22.2	20.0	31.0
Sales Contracts	77.9	30.0	34.6	58.8	46.7
Oral contracts only	42.9	66.7	11.1	50.0	37.9
Violation of terms	57.1	0.0	11.1	40.0	31.0

Source: Dioné (1989a), pp. 320, 329.

Note: Transport Cost/Means = high transport costs or inadequate availability of trucks. Multiple responses are allowed.

The percentage of traders by form of contract and the percentage of traders reporting violation of contract terms relate to the number of wholesalers operating contract transactions.

illustrates the political difficulty of this type of reform and the overriding concern of donors and the government of Mali to improve OPAM's financial situation. Access to these funds, along with drastic cuts in personnel (60%) and truck fleet (about two-thirds), improvement in stock management, and reduced consumer subsidies allowed OPAM to narrow its annual operating deficit by 68% between 1982 and 1986 (Dioné and Staatz, 1988). OPAM's financial improvement was also facilitated by poor harvests, which kept market prices above official producer prices from 1982 through the harvest of 1985, thereby reducing the domestic supply of cereals handled by the public sector. Reflow funds from food aid (which increased by 229%, from an annual average of 38,000 tons in 1978-81 to 125,000 tons in 1982-85) served as an effective means to finance the PRMC activities between 1981/82 and 1984/85 (OSCE, 1988).

The sustainability of both supporting producer prices through direct public sector intervention in the market and financing the reform program only with food-aid reflow funds was seriously challenged following two successive good harvests in 1985 and 1986. As a result of good rainfall, domestic coarse grain production rose by 44% in 1985 relative to 1984. OPAM was then authorized to use PRMC funds and bank credit to support producer prices (which had fell in November 1985 to as low as 35 CFAF/kg for maize in major surplus zones) through buffer-stock purchases at the official producer price of 55 CFAF/kg. Notwithstanding record public-sector purchases of nearly 83,000 tons of millet, sorghum and maize between December 1985 and February 1986, actual producer prices of coarse grains merely stayed around 50 CFAF/kg until March 1986, then fell to 42-45 CFAF/kg for millet and 31 CFAF/kg for maize in March 1986, as soon as OPAM's funds ran out and it withdrew from the market. Unable to resell more than 43% of the total 103,000 tons of grain acquired through domestic purchases and food aid, OPAM was caught with most of its working capital tied up into cereal stocks in 1986, mainly because sales official prices were set too high above market prices (République du Mali, 1987).

The situation grew even worse with a second good harvest in 1986, which exceeded that of the previous year by 4% (OSCE, 1988). OPAM's intervention in 1986/87 was limited to purchasing 10,000 tons of domestic foodgrains for to replenish the national security stock, since the parastatal was ineligible for new bank credit because of its incapacity to pay the loans contracted the previous year. Producer prices of coarse grains in major assembly markets fell an average of 25-31% in 1986/87 relative to 1985/86, with bottom-levels of 24-25 CFAF/kg for millet and sorghum and 17-18 CFAF/kg for maize over the period of January-March 1987 (Dioné and Staatz, 1988, p. 158; Dioné, 1989, p. 325).

These developments resulted in two major shifts in the policy-reform package. First, several donors gradually agreed to replace some of their food aid contribution with cash to be injected in the private grain marketing channels to support producer prices in years of abundant production. Second, by the end of 1987, the government of Mali abandoned the concept of official producer prices for coarse grains, and restricted OPAM's roles to: (i) managing the national security stock; (ii) managing and distributing food aid; (iii) assuring, in complementarity with the private sector, adequate food supplies in chronically food-deficit areas; (iv) developing and maintaining a market information system; and (v) providing other market facilitating services to private sector participants (Steffen, Dembélé and Staatz, 1988, pp. 4-7).

Table 6. Allocation of PRMC Food-Aid Reflow Funds (CFA million, 1981-87)

ALLOCATION	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	TOTAL
OPAM deficit coverage	452.0	195.0	408.0	--	--	--	1055.0
OPAM (Misc.)	--	--	--	--	1161.5	--	1161.5
Public sector imports	--	--	425.0	1211.0	--	--	1636.0
Nat'l security stocks	--	--	725.0	--	--	726.0	1451.0
Price support through:							
- OPAM	--	--	244.2	247.2	2454.0	--	2945.4
- ON*/OPAM	--	--	--	--	896.0	539.2	1435.2
- ORS** & ORM*** /OPAM	--	--	--	--	--	600.0	600.0
Office du Niger	--	--	--	152.0	--	--	152.0
Price stabilization through OSRP****	--	--	--	397.0	550.0	--	947.0
Studies & consulting	--	--	--	--	--	8.0	8.0
Private trader credit	--	--	--	--	--	500.0	500.0
Farmer coop. credit	--	--	--	--	--	500.0	500.0
Total funds used	452.0	195.0	1802.2	2007.8	5061.5	2873.2	12391.7
Public sector share (%)	100.0	100.0	100.0	100.0	100.0	64.9	91.9
OPAM's direct share (%)	100.0	100.0	100.0	72.6	71.4	25.3	66.6

*ON = Office du Niger, **ORS = Opération Riz Ségou,

***ORM = Opération Riz Mopti

****OSRP = Office de Stabilisation et de Régulation des Prix

Source: Mali, Ministère de Tutelle des Sociétés et Entreprises d'Etat (1987).

The combination of a poor harvest in 1987 and a temporary ban on rice imports in early 1988 led prices to rise enough to allow OPAM to sell off most of its commercial stocks and thus improve its financial situation again. In addition, OPAM is clearly moving since 1988 toward a specialization in producing and providing improved public-good type market services such as information and training for different market participants. The sustainability of these new developments thus far initiated and supported mainly by donors' financial and technical assistance is, however, a major challenge that the government of Mali will have to face in the 1990s.

5. ISSUES OF REGIONAL GRAIN TRADE LIBERALIZATION

The scope of the dialogue for foodgrain market liberalization has been broadened since 1986 from a national focus to a regional one, encompassing the entire Sahel and West Africa. A general consensus seems to emerge about the need to promote free private grain trade among the Sahelian countries and their coastal neighbors, though the idea of protecting such a regional cereals market from the rest of the world is still being strongly debated by policy-makers, donors and researchers. It is hoped that the removal of national barriers to commercial flows of cereals among these countries would expand demand beyond clandestine border-exports and reduce foodgrain price instability within the individual countries. This increase in demand in a more stable market would induce surplus-grain farmers with regional comparative advantage to produce more for the global market.

Instability in coarse-grain markets in the Sahel and West Africa is mainly caused by fluctuations in rainfall (therefore domestic production), however. Our Mali food-security research findings show that surplus-grain producers tend to retain a significant proportion of their annual surpluses in household's security stocks to protect themselves against eventual production shortfalls.¹⁵ The low productivity in rainfed cereals does not allow for the organization of substantial inter-annual buffer-stocks; one would therefore expect intra-regional grain trade to reduce only to some extent, but not eliminate, coarse-grain price instability. In addition, the lack of improved technology and institutional support for the production of these cereals will likely prevent a majority of farmers to respond to expanded foodgrain demand opportunities in the short run.

A simulation exercise by D'Agostino and Staatz (1989) shows that, under assumptions of fluctuating production and inelastic supply and demand, a reduction of interannual grain price instability would hurt or benefit different categories of rural households depending on the level of annual harvests. Following an abundant harvest (1986/87) in our CMDT and OHV survey zones in Mali, a 30% reduction in the absolute deviation of grain prices from their mean would increase both the hypothetical net expenses of net cereals buyers (buyers and sellers/buyers) by 9% to 20% and the hypothetical revenue of net sellers by 13% to 29% (Table 7). Following a poor harvest (1987/88), the same reduction in coarse-grain price instability would reduce both net buyers' expenses by 6% to 12% and net sellers' revenue by 9% to 12%.

¹⁵ The estimated family security stocks of coarse grains built over 1985/86 and 1986/87 could meet home consumption needs for a period of 16 months for the sample farm households in the CMDT zone and 13 months for the group of fully-equipped households (Dioné, 1989a).

Table 7. Effect of Reducing Interannual Price Variability on Average Rural Household's Income, CMDT et OHV, Mali (1985/86-1987/88)

ZONES AND YEARS	BUY ONLY (c)			SELL ONLY (d)			BUY AND SELL (e)		
	EXPENSE (1)	HYPOTH. VARI- EXPENSE (2)	VARI- ATION (2/1)	REVENUE (1)	HYPOTH. VARI- REVENUE (2)	VARI- ATION (2/1)	NET EXPENSE (1)	HYPOTH. VARI- NET EXP. (2)	VARI- ATION (2/1)
CMDT (a)									
1986/87	12560	13616	8%	18591	20208	9%	15409	17515	14%
1987/88	44726	41845	-6%	29503	27807	-6%	15198	14374	-5%

OHV (a)									
1986/87	28679	30779	7%	9734	12198	25%	13849	14711	6%
1987/88	51462	49377	-4%	11687	10451	-11%	23369	21498	-8%

CMDT (b)									
1986/87	12560	14144	13%	18591	21017	13%	15409	18567	20%
1987/88	44726	40405	-10%	29503	26959	-9%	15198	13963	-8%

OHV (b)									
1986/87	28679	31829	11%	9734	12566	29%	13849	15142	9%
1987/88	51462	48335	-6%	11687	10301	-12%	23369	20562	-12%

Source: D'Agostino and Staatz (1989).

Note: Underlying assumptions:

- (a) 20% reduction in the absolute deviation of prices from the mean.
- (b) 30% reduction in the absolute deviation of prices from the mean.
- (c) Perfectly inelastic demand for coarse grains.
- (d) Perfectly inelastic supply of coarse grains.
- (e) Perfectly inelastic demand for, and supply of, coarse grains.

The results of this exercise clearly show that regional grain trade liberalization, just as national cereals market liberalization, would not affect uniformly different categories of farmers. The same simulation can be expanded using alternative assumptions. First, one may safely assume that, in a multi-annual perspective, regional trade liberalization would result in net coarse-grain exports from Mali, a country where relatively low income levels and restriction of cereals exports generally maintain grain prices at levels below those in neighboring countries. Reduction in price instability caused by regional trade would therefore be accompanied in Mali by an increase in the average price level and the magnitude of the gains and losses discussed above. Second, the total available income that poor food-deficit households may spend as well as the borrowing capacity of these households are severely limited during any year. This would imply that the total expenses of food-deficit rural households on cereals -- rather than their demand for grain -- are inflexible to foodgrain prices. For the same level of available annual income, lower prices would allow these households to buy greater quantities of cereals, while higher prices would constrain them to smaller purchases, thereby reducing their access to, and consumption of, foodgrain. Third, fully-unrestricted foodgrain trade (elastic supply of grain) would likely reduce both the relative gains and losses discussed above, and induce, depending on the degree of substitubility among different types of cereals, some changes in the consumption patterns of net grain buyers. These arguments clearly illustrate the need to carefully examine the distributive effects of various policy-reform packages on the food security of different segments of the population under different scenarios.

6. CONCLUSION AND IMPLICATIONS FOR THE SAHEL

Structural adjustment lending programs started in the 1980s and they are now underway in 32 out of the 45 countries of sub-Saharan Africa. Mali, a poor and landlocked country in the Sahelian region of West Africa, was chosen by donors as a test-case. Donors offered to provide multiyear food aid to help feed Mali's cities in exchange for foodgrain pricing and marketing policy reforms. The cereal market liberalization program in Mali (PRMC) was launched on the basis of implicit assumptions about both farmers' and traders' capacity and propensity to respond to cereal market incentives. Because most of the initial assumptions were unsustainable, numerous changes have been made in the program. As a result, some progress has been made since 1981: private grain trade has been legalized; cereals circulate more freely from suppliers to consumers; the roles of the public sector have been more appropriately redefined to some extent; and market facilitating services such as financing and information are improving.

Nevertheless, improving foodgrain pricing and marketing, however important, addresses only one of the five fundamental causes of food insecurity in Mali and the Sahel. The government of Mali and donors still have to address several additional crucial issues. On the production side, the weakness of the national agricultural research system results in the lack of appropriate agricultural technology that farmers can adopt to increase and stabilize productivity in foodgrains. Farmers' capacity to respond to new market opportunity sets is severely undermined by heavy and rigid taxation and restricted access to more income-generating activities (such as cash-crop production), improved technologies, credit, input supplies, and efficient supporting institutions. These deficiencies critically hamper growth in food and agricultural production by impeding sustained capital formation through the adoption of more productive technologies in the rural area.

On the demand side, considerable instability in the cereal markets remains an unresolved issue for farmers, traders, as well as their clients. The rice production-consumption gap is also a major issue to address, since the demand for rice will continue to grow with urban population, while domestic production of rice under irrigation continues to be unable to compete with imported rice and no major prospect for expanding foreign-exchange earnings is in immediate sight. Above all, the entire foodgrain production-distribution system must cope with a persisting weakness of effective demand, which is characteristic of the general poverty and liquidity crisis of Malian consumers. The effects on food security of the cereal market liberalization will remain modest as long as adequate attention is not also paid to these other major issues.

Notwithstanding some country-specificities, three major lessons emerge from Mali's experience with market liberalization for the Sahel. First, because structural adjustment programs involve tough political and institutional issues, and given the poor climatic, institutional and technological context of the Sahel, food security policy reform in Sahelian countries must be perceived as a medium to long-term battle. It is clearly not a short-term undertaking as it was perceived by donors when the cereal market liberalization program was launched in 1981 in Mali. Second, the complexity of the food insecurity problems in the Sahel calls for a comprehensive approach to improving rural incomes accross the board. Third, since severe resource limitations prevent Sahelian countries from simultaneously tackling all the major causes of their food insecurity, the prioritization and the sequencing of the reforms become crucial. Focussing on the root cause of food insecurity, poverty, should guide Sahelian governments' and donors' choice of actions. Since the bulk of the population of Mali and the Sahel are farmers, national food security policies must first deal with both sides of the food-security equation -- increasing food availability and access to food -- at the household level. Such national policies would require substantial and long-term comitment to invest primarily to increase the productivity of food staples, recapture domestic markets through improved competitiveness, and generate new employment and income streams for the rural as well as the urban poor. In this sense, food security in the Sahel also involves improving cash-crop production and nonfarm activities along with food-crop production.

APPENDIX

OVERVIEW OF THE CESA/MSU/USAID FOOD SECURITY RESEARCH PROJECT IN MALI

Empirical findings cited in this paper about foodgrain producers and traders in Mali result from primary data generated between October 1985 and October 1988 by the on-going CESA/MSU/USAID Food Security Research Project. These data were collected at the level of a two-stage stratified sample of 990 farm households at the first stage and 190 farm households at the second stage, and a panel of 118 coarse-grain wholesalers in four of the major cities (Koutiala and Sikasso in the surplus-producing zones, and Bamako and Mopti in major marketed-cereal consumption zones). The sample farm-households came from 16 villages, which were equally distributed between the south (about 1,000 mm of annual rainfall) and the north (approximately 700 mm of annual rainfall) of two savannah zones with similar agricultural resource endowments: the CMDT, which produces the bulk of cotton and has the best agricultural support institutions in Mali, and the OHV, which has a weaker institutional base. The 190 farm-household panel was roughly distributed equally among 3 technological strata, i.e., farmers owning (1) a full set of animal traction equipment, (2) an incomplete set of animal traction equipment, and (3) no such equipment.

Coarse-grain transaction (quantity and price) data were collected through repeated enumerator interviews, weekly in the major rural markets of the survey zones and monthly for farmers and wholesalers. These price data were complemented with PRMC-monitoring of time-series of cereal retail prices in the 8 regional capitals of Mali. Less repetitive questionnaires and informal interviews were used to collect basic information on farm household production and farmer and trader characteristics and perceptions.

The primary data was processed for analysis using both tabular and econometric techniques. The results reported in this paper are essentially estimated group-averages for the 990 farm-household sample, where the estimates from the smaller 190 household sample are weighted by the respective proportions of the different farm strata among all the farms of the 16 survey-villages. The empirical findings of these analyses have been reported in numerous working papers and other documents, and continuously discussed with policy decision-makers of the government of Mali, members of the Technical Secretariat of CESA (the national monitoring and evaluation commission of the food strategy of Mali), and representative of the PRMC donors. These frequent discussions have helped develop and maintain close interactions and feedback between policy makers and food security policy researchers in course of the on-going policy dialogue between the government of Mali and donors on food policy reforms. Weber et al. (1988) discuss the importance of this approach of simultaneously improving both the supply of, and demand for, policy-relevant empirical insights.

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