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**CEREALS MARKETING LIBERALIZATION IN MALI:
AN ECONOMIC POLICY REFORM ASSESSMENT**

by

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PREFACE

This study was commissioned by the Office of Development Planning in response to a request from the senior management of the Africa Bureau. The purpose of the request was to improve A.I.D.'s knowledge regarding the impacts on economic growth and equity of policy reform programs in Africa. This study and related studies, in Somalia and Zambia, constitute the field studies for Phase I of the Office of Development Planning's Policy Reform Impact Assessment activities.

Each of the three country studies was prepared in the field during January 1987 by three member teams. Teams were comprised of 2 members provided under A.I.D.'s Macroeconomics Indefinite Quantity Contract with Robert R. Nathan Associates, Inc., Development Alternatives, Inc., and Boston University. The Bureau for Africa, Office of Development Planning provided the third member for each team. A fourth report synthesizes the findings with respect to the impact of policy reform programs in Africa.

Under Phase II, analytical activities will continue to broaden and deepen A.I.D.'s knowledge of the impacts of policy reforms in Africa. These activities will continue in fiscal 1987 and 1988.

John A. Patterson,
Associate Assistant Administrator
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March 16, 1987

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LIST OF ABBREVIATIONS

BCEAO	Central Bank of West African States
CAA	(Mali) Amortization Fund
CMDT	Malian Textile Development Company
CNAVS	(Mali) National Committee for Assistance to Drought Victims
EEC	European Economic Community
EPRP	(U. S.) Economic Policy Reform Program
FAC	French Aid Agency
F CFA	West African Franc
FAO	(United Nations) Food and Agriculture Organization
GDP	Gross Domestic Product
GRM	Government of the Republic of Mali
IER	(Mali) Rural Economy Institute
IMF	International Monetary Fund
MOA	(Mali) Ministry of Agriculture
ODR	Rural Development Organization
OHV	Operation Haute Valle
ON	Office du Niger
OPAM	(Mali) State Cereals Marketing Agency
ORM	Operation Riz Mopti
OSRP	(Mali) Price Stabilization Fund
PRMC	Cereals Market Restructuring Program
SNS	(Mali) National Security Stock
SOMIEX	(Mali) State Trading Company
SUP	Service d'Utilitie Public
WAMU	West African Monetary Union

CEREALS MARKETING LIBERALIZATION IN MALI: AN ECONOMIC POLICY REFORM ASSESSMENT

EXECUTIVE SUMMARY

In 1981, Mali began a series of price policy and market restructuring reforms in the cereals sub-sector. These reforms have been supported by several donors, including the United States, through the Cereals Market Restructuring Program (PRMC). The goal of these reforms is the achievement food security on a self-sustaining basis. The program's primary strategies are:

- o To legalize and develop private cereals marketing;
- o To improve incentives for farmers; and
- o To reduce subsidies to the state grain marketing system.

PURPOSE OF THIS STUDY

The purpose of this study is to assess the impacts of the PRMC program on production and consumption, on private trade, and on the operational efficiency of OPAM, the state grain trading agency.

OVERALL ASSESSMENT

Policy reforms had a positive, but limited, impact in Mali. The most significant gains for the economy as a whole came through gains in market efficiency. Producers, traders, and consumers are better off because of freer cereals markets. Also, several economies were realized in public sector marketing operations. Greater gains from market reforms may lie ahead. Rice trade was only decontrolled recently.

Policy reforms also resulted in financial transfers within Mali's cereals sub-sector. Price policy reforms led to a shift in subsidies, from consumers to producers. The private sector gained from decreased interference and an expanded role in the sub-sector. Central to these gains has been PRMC-donor support.

The Government of Mali adopted the PRMC program in the face of severe financial difficulties and prompting by the IMF and donor community. But the program called for dismantling of policies which benefited the most powerful political constituencies. In the end, donors accepted postponement of several critical reforms.

The PRMC is rightly celebrated as a successful exercise of donor coordination. Donors exhibited a serious commitment to consultation and consensus building in directing their assistance. This provided considerable flexibility in reacting to volatile financial and food supply conditions. But fundamental differences among the donors on the direction of reforms were sometimes obscured.

Policy reforms did not have the desired effect in three critical areas. First, no link has been established between increases in cereals production and policy reforms. Second, although farmers' incomes probably increased, it is not possible to disentangle the incentive effects of policy reforms from improvements caused by the weather. Third, variability in domestic cereal production overwhelmed the public sector. It was barely able to stabilize consumer prices as expected during the drought years. When cereals output rebounded, the public sector was unable to sustain its buying operations.

IMPACT ON PRIVATE SECTOR GRAIN TRADE

The main impact of liberalization has been less on the volume of private sector trade than on its efficiency. Prior to the reforms, most of the trade of sorghum, millet and maize was conducted illegally. Now, this trade is out in the open. But, liberalization of the rice market did not occur until the 1986/87 growing season. Private merchants have yet to purchase significant quantities of rice in the important state-controlled irrigation schemes. However, significant quantities of rice have been imported by private traders since 1981 when imports were legalized.

Interference in grain markets by local authorities is still common, but is not as disruptive as under the pre-1981 policies. There is also evidence of a reduction in aggregate costs, in the marketing channel between the farm gate and consumers. From small merchants to larger wholesalers, the private sector is just beginning to capitalize on the new opportunities provided by the PRMC program. At present, however, tight credit and large grain stocks are constraining growth in the private sector.

IMPACT ON CEREALS PRODUCTION

Overall, the study team believes that the reform package had a slight, positive effect on Malian cereals production, in the short term. However, it is virtually impossible to trace direct causal links between reforms and recent increases in cereals output. Weather is the dominant cause of fluctuation in output during the 1980's. And, OPAM's market interventions to support producer prices for sorghum and millet were only effective for a short time-- mainly a six month period in 1985/86. In other years, support prices were largely irrelevant, as market prices were higher.

In contrast, there is evidence that high-input maize output has increased as farmers apparently have increased production for the cash market. A substantial contraction in area planted to maize is likely in 1987/88, unless there is a substantial state purchasing intervention to boost market prices which are currently at low levels.

To date, the main effect of the reforms on farmers' incomes was the one-time transfer that occurred in 1985/86, due to public sector purchasing. Limited OPAM interventions in 1986/87 will have a similar, but smaller impact. In addition, farmers may have benefited from increases in market efficiency. Since there is a competitive marketplace, increases in market efficiency are likely to be passed on to both producers and consumers. There are substantial income differences among farmers, depending on whether they have surpluses to market and when in the year they can afford to make their sales and purchases.

IMPACT ON THE STATE CEREALS TRADING AGENCY

As a result of direct PRMC assistance, OPAM significantly reduced its operating deficits through mid-1985. The biggest savings came through the liquidation of much of its truck fleet, personnel reductions, tighter management control, and contracting for services with the private sector. There is still much room for improvement, particularly in reducing the number of employees and cutting costs for cereals-producing rural development organizations.

OPAM's deficit reduction efforts were overwhelmed by its large buying campaign, beginning in late-1985, when cereals production recovered following three years of drought. Increases in the margin between official producer and consumer prices came too late for OPAM. As OPAM increased its purchases, market prices fell below official consumer prices. As a result, OPAM has been unable to unload its supplies under current policies and its operating costs are mounting.

IMPACT ON CONSUMERS

Liberalization benefited consumers by providing greater access to food supplies and, at least marginally, by lowering consumer prices. PRMC-donor assistance played a key role, providing food during deficit periods to keep consumer prices within reasonable levels. To the extent that adequate food supplies helped to keep a lid on market prices, all consumers benefited, including a large number of small farmers who purchase food during the lean months.

Food supply policies have favored higher-income urban consumers, especially civil servants and the army. These privileged groups, with greater access to OPAM supplies, received implicit subsidies. Local currency generated from sales of PRMC food aid facilitated a gradual approach to raising official consumer prices and reducing these subsidies. This was necessary as the Government of Mali was under great pressure to maintain public employees' purchasing power to counter-balance a three-year wage freeze.

RECOMMENDATIONS

The weaknesses of pricing policies have been exposed by the current food surpluses. The Government of Mali cannot sustain a policy of unlimited cereals purchases at official, support prices. There is a lack of consensus within Mali and the donor community regarding appropriate role of the state in setting prices and marketing cereals. A more limited and flexible policy is required. It must be financially viable so as to be credible if it is to have a favorable impact on producers.

The time is ripe to direct more resources to development of private trade in the cereals sub-sector. A.I.D.'s current initiative to provide credit, particularly to small merchants, is a positive step. Further investments are required to develop market information systems, transportation network, credit availability, human capital and policy analysis capabilities.

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CEREALS MARKETING LIBERALIZATION IN MALI: AN ECONOMIC POLICY REFORM ASSESSMENT

I. INTRODUCTION AND BACKGROUND

PURPOSE OF THE ASSESSMENT

This assessment of progress in agricultural policy reform in Mali is one of three conducted in January 1987 for the Office of Development Planning of the Africa Bureau of USAID. In it we examine the objectives and results of a group of policy reform actions aimed at improving the performance of the heart of the Malian economy, its cereals sub-sector. These reforms were promoted through a unique multi-donor approach to using the proceeds from monetized food aid (and some technical assistance) to leverage substantial change towards market liberalization. This paper examines reform program impact on producers, consumers, the private sector grain trade, and the operations of OPAM, the state grain trading agency.*

ECONOMIC BACKGROUND

Mali, with a per capita income of \$140 per year in 1984, is considered one of the world's poorest countries. Of a population of approximately 8 million, 80 percent live in rural areas where most are subsistence, dryland farmers. Although the country covers a large geographical area, its resource base is limited. Much of northern Mali is desert and unsuited to agriculture. Most of the country's population and economic activity are found in the southern half of the country, through which flow the Niger, Bani, and Bafing Rivers.

Agriculture, including livestock production, accounts for nearly 80 percent of GDP. Mali's major agricultural products are cereals, peanuts, cotton, and livestock. The public sector has a large presence in the economy. Private sector manufacturing and commercial activities play a residual, though increasing, role, largely related to agriculture.

* To accomplish this task the team spent a bit more than two weeks in Mali interviewing Malian and donor officials, and a small number of farmers and cereals traders, the latter during a field trip through central and southeastern Mali. In addition, the team, prior to departure from the U.S., was able to draw on the substantial personal and documentary resources on this topic available in A.I.D., the World Bank, and the Michigan State University Food Security in Africa Project. The team would particularly like to thank Emmy Simmons and Oumar Dia of the A.I.D. mission in Bamako for their help in completing this assignment in the short time available.

Mali suffers from chronic difficulties with public finance and balance of payments. Government expenditures consistently exceed revenues. The primary sources of revenue are taxes on international trade and modern sector income, and head and sales taxes. Government expenditures are dominated by wages and salaries. Budgetary support of public enterprises and special funds, including the Amortization Fund (CAA) and the Price Stabilization Fund (OSRP), is also significant. Government budget deficits have been financed by foreign grants and loans, with domestic financing and arrears, particularly on salaries, playing a smaller role. Mali's budget deficit was F CFA 9 billion in 1984 (US\$ 29.7 million).

Mali's major exports are cotton and livestock, but the country is heavily dependent on imports of petroleum products, capital equipment and, in most years, cereals. In 1985, imports exceeded exports by F CFA 112 billion¹ (about US\$ 370 million), as consumption expenditures accounted for 91 percent of GDP. With investment expenditures equivalent to 26 percent of GDP, Mali relies heavily on external financing. Official development assistance, including grants and loans, was \$320 million in 1984. By the end of 1984, Mali's outstanding debt reached \$960 million or 110 percent of GNP. Actual debt service, including payments to the IMF, reached 17.5 percent of export earnings.

Between 1965 and 1985, Mali's per capita GDP grew at the rate of 1.2 percent per year, less than half the estimated rate of population growth. Severe drought reduced agricultural output between late 1982 and 1985. As a result, real per capita GDP declined between 1983 and 1985. Markedly improved rainfall and harvests in late 1985 and 1986 provided substantial GDP growth in 1986.

DONOR-SUPPORTED POLICY REFORM EFFORTS

Due to lack of economic growth, Mali began to take significant steps in reforming economic policies in the early 1980s. Furthermore, the IMF and Mali's bilateral donors began linking economic assistance to policy reform actions. To provide a better understanding of the policy-reform environment -- of which agricultural sector reforms represent one part -- other economic policy reforms are described below.

¹ At a January 1987 exchange rate of 300 F CFA per US\$1.00; 1 billion F CFA is approximately equal to US\$3.3 million.

Money and Banking

In 1981, Mali reached agreement with the member states of the West African Monetary Union (WAMU) and joined the union in June 1984. Accepting the discipline of the Central Bank of West African States (BCEAO) involved several monetary reforms, including:

- o Mali's currency was replaced by the Franc CFA;
- o The Central Bank of Mali was abolished;
- o Foreign exchange reserves were pooled with those of other members;
- o Restrictions on capital movements between Mali and other WAMU states were lifted; and
- o Mali accepted WAMU's common interest rate structure and controls on credit expansion.

Mali's entry into WAMU was facilitated by France's financial aid, including its consolidation, on favorable terms, of F CFA 75 billion in debts and the cancellation of F CFA 61 billion more.

Three IMF stand-by agreements since 1981 have contributed to money and banking policy reforms. Under the first two stand-bys, Mali agreed to:

- o Renegotiate external debts;
- o Limit external borrowing by the government;
- o Limit expansion of domestic credit and of bank credit to the government;
- o Raise interest rates to harmonize them with WAMU; and
- o Reform banking policies, particularly for the National Development Bank.

Under the third stand-by, Mali agreed to restrict external borrowing, eliminate arrears of the CAA and the Road Fund, limit the growth of domestic liquidity and curtail the growth of domestic bank credit.

The effects of these measures are illustrated by the following indicators:

- o In 1985, inflation slowed to the targeted 8.3 percent per year;
- o Growth in net credit to the government slowed to 2.4 percent per year; and

- o External arrears were reduced from F CFA 54.3 billion in 1981 to F CFA 4.3 billion in 1985.

Public Finance

Government revenues increased from 12.4 percent to 14.6 percent of GDP between 1981 and 1985. The three IMF agreements between 1982 and 1986 were conditioned on a set of revenue related reforms, including those affecting the collection of customs duties. In addition, the 1985 U.S.-backed Economic Policy Reform Program (EPRP) supported a realignment of these duties. Tariffs on raw and semi-finished goods were reduced, while tariffs on finished goods were increased.

Additional reforms to increase revenues under the IMF programs included improving tax collection and administration, and raising taxes on petroleum imports. In order to capture revenues for the government's operating budget, certain special accounts, including one for cotton, were abolished.

In order to offset the effects of these measures and to encourage private sector activity, payroll and business income taxes are being reduced. Beginning in 1985, the EPRP provided budgetary support to compensate the GRM for revenues lost through tax reduction.

Mali has made a major effort to reduce government personnel expenditures. They have reduced the size of the civil service, and government wages were frozen between February 1982 and March 1985. Other measures to reduce government spending include reducing scholarships and automatic hiring of all secondary school graduates, improving budget management, and instituting investment planning procedures. The IMF program called for the scheduled reduction of public sector arrears in domestic and external debt payments.

Industry and Service Sector

Since the early 1980s, Mali has engaged in efforts to restructure its public enterprises while encouraging private sector activity and reducing public sector intervention in the economy. By 1982, Mali had over 50 non-financial and non-agricultural public enterprises. Their combined operating losses grew to an estimated F CFA 7.6 billion in 1982. In conjunction with IMF stand-by agreements, employment by public enterprises has decreased and by late 1985, the GRM had liquidated seven non-viable public enterprises. The IMF, World Bank, and other donors are working with Mali to privatize or liquidate others. In order to assist this process, much of the public enterprise sector's debt was consolidated and assumed by the government when Mali entered WAMU.

Agriculture Sector Reforms

The most significant reforms in the agricultural sector have been in cotton and cereals marketing. In 1983, cotton policies were reformed when an income stabilization fund was established for producers. Instead of going directly to SOMIEX, the state trading company, as before, any export profits are used to replenish the stabilization fund, with the balance reverting to the Treasury. The "Compagnie Malienne pour le Developpement des Fibres Textiles" (CMDT) and SOMIEX are compensated for costs of services provided. These reforms were supported by IMF agreements and the multi-donor Mali-Sud project.

After a brief description of production and marketing in the Malian cereals sub-sector, subsequent chapters provide a more detailed assessment of the cereals marketing reforms.

II. AN OVERVIEW OF PRODUCTION AND MARKETING IN THE CEREALS SUB-SECTOR

PRODUCTION

Mali is a country of small-scale sorghum and millet producers. From 80 to 100 percent of the sorghum and millet crop is consumed by the farm household itself -- this, in a farm economy where sorghum/millet acreage typically represents 80 percent of total land cultivated. Over the past 15 years, these two grains, grown largely under traditional, low input methods, comprised roughly 80 percent of total national cereals production of about one million tons (see Statistical Annex, Table C-1).

Maize has contributed 9 or 10 percent of national cereals production; it is most often grown in small fields adjacent to the family compound to take advantage of "night soil" fertility. Increasingly, however, it is being grown using improved dry-land technologies provided by the Rural Development Organizations (ODR's).

In the areas receiving extension services and inputs from the Malian cotton company (CMDT), farmers are growing both cereals and cash crops (mainly cotton and peanuts). These farmers employ expensive animal traction equipment, pesticides, and fertilizers to produce cotton for export. They obtain higher yields on sorghum and millet in rotation due to residual soil fertility. They also use chemical fertilizer to grow maize as a cash crop; this increased when world cotton prices plummeted in 1985 and cotton input subsidies were substantially reduced in 1986.

Milled rice makes up the remaining 10 to 11 percent of total cereals production (Bremer and Ellsworth, 1986). Approximately 40 percent of the paddy is produced under controlled irrigation, mostly in the "Office du Niger" scheme in the inland delta of the Niger River. These farmers generally market all or most of their rice and purchase other grain on the cash market. Rice is the only Malian-grown cereal that competes directly with commercial imports.

Over the past dozen years, Malian farmers have, on average, produced about 83 percent of the cereals needed for national annual consumption (A.I.D., 1987). However, the dominant characteristic of dry-land grain production in Mali is its extreme variability both from year to year and over even relatively small geographical distances within each production year. In the 1984 crop year, total cereals production provided only about 50 percent of total estimated national consumption needs. This was the third and worst of three consecutive deficit years during the PRMC program.

The past two years have been at the opposite extreme-- total cereal produced in 1985 was estimated to be 60 percent above average and, in 1986, 68 percent above average. These back-to-back bumper harvests have totally reversed the Malian cereals marketing situation and have necessitated rapid GRM conversion to a "surplus management strategy," however temporary that surplus may be.

MARKETING

A look at marketing channels for cereals begins at and beyond the farm gate. Only a minority of farmers provide a marketable surplus of grain, even in good years, such as 1985/86. Tabulation of one year's worth of farm-gate grain transactions by farmers in a sample studied under the AID-funded, Michigan State University Food Security Research Project shows that:

- o 40 percent sold more grain than they bought;
- o 20 percent bought more grain than they sold; and
- o 40 percent sold no grain at all (but most bought some).

Large amounts of grain are given away to cement relationships of mutual obligation. Further, the MSU team found great variation in the average amount of grain that farmers market during one marketing year in the southern and northern parts of the CMDT and Operation Haute Valle (OHV) project zones. Larger households with full animal traction sets in the southern zones have the largest marketed surpluses, for example (see Statistical Annex, Table C-2).

Dealing with the highly variable farm production and sales base is a hierarchy of traders who aggregate, transport, store, break bulk and resell surplus grain. The numbers of traders are quite large at the first handler and retail levels but decrease rapidly at the level of the wholesale grain trade. There is evidence that private trade is efficient and competitive (Dione and Dembele, 1986a). Wholesalers in surplus zones take much of the risk and finance the movement of surpluses to urban areas for resale or transshipment.

The key actors in the private Malian grain trade are the larger wholesalers who have their own capital and limited access to bank credit. These traders provide much of the working capital which the smaller traders (or agents) use to purchase grain. When they run short of financing, which happens not infrequently as very little formal credit is available to the commercial sector at any price, the marketing system grinds to a halt.

It is important to note that the structure of marketing for rice is substantially more concentrated than that for sorghum/millet and maize. This is because:

- o Rice production is much more concentrated geographically than is coarse grain production;
- o The ODRs are still actively involved in marketing;
- o Private rice marketing channels can and do switch rapidly to import supply channels if necessary; and
- o Rice consumption is mostly an urban phenomenon.

The Malian state grain trading organization, OPAM, and related rural development organizations (ODRs) operate in the grain marketing system, often in direct competition with the private sector. But, on average, OPAM has handled only about 10 to 15 percent of marketed surplus (or only 2 to 3 percent of total production) per year.

Finally, Table C-3 in the Statistical Annex gives us a "snapshot" view of the entire cereals sub-sector. It presents the estimated "national cereals budget" for 1986/87. After two bumper crops and with very large public and private carryover stocks from the 1985/86 year, Mali has an estimated aggregate surplus of 124,000 tons of cereals for 1986/87, once consumption (at 167 kg. per capita) has been accounted for. Some implications of this situation appear later in this report.

III. THE PRMC PROGRAM: OBJECTIVES, ACTIONS AND IMPACTS

INTRODUCTION

Cereals marketing reforms in Mali have been conducted with the support of the multi-donor Cereals Market Restructuring Program, (known by the French acronym, PRMC). The PRMC is essentially a food-for-development effort which also has involved some technical assistance provided by the French and the World Bank. To launch the program, each donor country (France, Canada, the EEC, the Netherlands, Germany, Britain, Belgium, the World Food Program, and the U.S.) made multi-year pledges of food aid which would be monetized. The resulting Counterpart Fund is jointly programmed by the donors, in negotiation with the GRM, and used to assist Mali in undertaking specific actions to implement an agreed-upon program of policy and institutional reform.

The total contribution being made by all donors to this program is very substantial in terms of its impact on GRM finances. The value of the 250,000 tons of food aid scheduled to be delivered during the first five years of the program is about \$90 million. The U.S. contribution was to be 25,000 tons of rice, of which 15,000 tons has been transferred to Mali in the agreed-upon time period (5,000 tons of that amount are still unsold due to recent surplus conditions; see A.I.D., 1987).

The goal of the PRMC has been to assist Mali to achieve sustainable food security. Its purpose is to achieve marketing policy reform in the cereals sub-sector with the coordinated support of Mali's largest donors. PRMC has three distinct but interrelated objectives:

- o Market liberalization
- o Improvement of cereals production incentives; and
- o Reduction of subsidies to the state grain marketing system.

In the implementation of the program, a number of specific policy reform actions have been taken to meet the objectives stated above. These reforms are listed in Table 1, grouped under the major categories that we will use in describing them and assessing their impact. PRMC is not a simple program; it is targeted at the heart of the Malian food economy and, as such, the various program actions have had multiple and interdependent effects on major groups of actors in the sub-sector: producers, state marketing organizations, grain traders in the private sector, and consumers.

Table 1. Major Reform Actions Taken Under the PRMC
Reform Actions by Impact Area

<u>Private Trade</u>	<u>Producers</u>	<u>OPAM/ODRs</u>	<u>Consumers</u>
Ended confiscation; reduced harassment	Raises official floor prices	Reduced OPAM mandate	Allowed private cereals trade
Made existing trade in grain, rice legal	Legalized private trade	Increased marketing margin	Regulated consumer price; increased consumer price
Legalized private cereals imports		Improved efficiency; reduced subsidies	Provided food security "safety net"

LIBERALIZATION OF MARKETING

The GRM, in March 1981, officially agreed to liberalization of the grain trade. This involved giving private merchants the legal right to purchase and sell food grain. It also included eliminating government regulations that increased the cost of private sector operations.

These actions could be considered the centerpiece of the reform program. By liberalizing trade of food grains, the GRM abolished a government monopoly, exercised by OPAM and through the Rural Development Organizations, that had been in place since 1965. The intention of liberalization was to avoid the inefficiencies of OPAM's marketing operations, while letting it provide the other food supply services that were still needed, including regulation of the liberalized market.

Policy Reforms The immediate steps taken were:

- o Elimination of roadblocks and seizures of grain shipments on the main roads to Bamako and Mopti;
- o Opening of all coarse grain trade to licensed merchants in the 1981/82 marketing season; and
- o Legalization of all grain imports by private merchants without taxing the imports, applying quotas or restricting access to foreign exchange; (exports have yet to be liberalized).

The liberalization of paddy and rice marketing has occurred much more slowly. It was only in the fourth year of the program (1984/85) that traders were officially allowed to enter the Mopti

rice perimeter. In the same year, the "Office du Niger" (ON) allowed farmers organized into cooperatives to thresh their own paddy and deliver it to the mills. The ON also started paying the farmers in cash rather than in promissory notes.

In February, 1986, private merchants were allowed to purchase paddy in the ON command area, the largest public irrigated perimeter. This was near the end of the marketing season after ON had bought enough paddy to cover its needs and had recovered producer debts. Thus, only in the 1986/87 season will merchants have their first full access to the perimeter for an entire season. While the merchants are required to purchase paddy at the official floor price level, many of the observers doubt the merchants will do this and the regulation will not be enforced.

Another reform that opened more of the rice market to private merchants was allowing them to use "Office du Niger" milling services, starting in the 1985/86 season. The milling charge is 15 F CFA/kg. Hulls and brokens are left with the ON. It should be noted that the latter practice is providing a substantial disincentive to merchants who say that the loss of milling by-products makes the total ON price too high.

Still another "rice reform" for the 1986/87 season was allowing the ODRs to sell rice to private merchants rather than only to OPAM.

Implementation While merchants are free to buy and sell food grain, they still must to be licensed for domestic trade and have to obtain special permits for imports. The GRM still has its "economic police" enforcing these and other regulations. According to merchants interviewed, non-compliance fines are imposed arbitrarily, often with the intention of obtaining a personal payoff. The annual cost of the payoffs (up to three to four times per year) is less than paying the licensing fees, but still enough to upset the cash balance of some merchants. The MSU study has found that such harassment has caused traders to temporarily abandon markets.

The rice marketing reforms were announced to the ODRs in a timely manner by OPAM and other government offices in Bamako. However, according to the March 1986 Evaluation Report, "Private traders were not informed of their right to purchase grain in the Office...No copies of the information sheets prepared by the Office in both French and Bambara were available." The impact of these recent reforms in paddy marketing will become manifest over the next cropping season or two.

Impact on Private Trade

With the exception of imports, liberalization has not yet had a significant impact on volumes of cereals traded by the private sector. Private imports reached record levels in 1984/85 at 150,000 to 170,000 metric tons, mostly rice. Although private merchants dominated the domestic coarse grain market from 1981 to 1985, they had done so before, illegally. Typically, they handled 90 percent or more of the marketed surplus in sorghum/millet. Even in the 1985/86 season when OPAM was buying 70,000 metric tons, many traders were able to profit by buying grain at the open market price (about 35 to 50 F CFA for coarse grains) and then selling to OPAM at the official resale price (ranging from 62 to 76 F CFA/kg.); the merchants supplied an estimated 60 to 70 percent of OPAM's purchases.

For the rice trade, until 1985/86, the ON controlled about 40 percent of the rice produced in Mali. To the extent there was any surplus in other ODR areas, the ODR's controlled the market. For the Operation Riz Mopti (ORM) area, there had been no marketed surplus (due to insufficient floods) until the time that the area was opened to private merchants. In both ORM and ON areas, private merchants have yet to purchase significant quantities.

The main impact of liberalization was less on the level of trade than on its efficiency. Since private marketing activities were illegal before the market was opened to private trade, there is little hard data to compare the two periods. Interviews conducted by this team with merchants in Segou, Koutiala, and Sikasso indicate that little has changed. Prior to 1981, the enforcement of the ban on private trade was not completely effective, as payoffs to officials allowed the traders to operate. Liberalization has merely reduced these costs of doing business. It is unclear how the benefits of this improved efficiency have affected consumers and producers. It seems that the reduced costs were passed on to both groups since the market was reasonably competitive.

The continuation of regulatory barriers and corruption in enforcement have affected some merchants, particularly smaller ones, with little capital to cushion such losses. In general, the private sector has been able to absorb this added cost, or pass it on, and operate profitably.

Causality The years of delay in opening the paddy and rice trade were attributed mainly to the perceived need of the GRM to control purchasing in order to guarantee supplies to OPAM (OPAM preferred rice to coarse grains) and to use the monopsony power as a way to enforce repayment by farmers of project-financed debt and payment of water user fees. The potential undermining of credit arrangements in agricultural schemes through liberalization is a serious concern which donors and the GRM are addressing only now in agricultural project design.

Both the ON and the ORM were reluctant to inform local merchants about policy changes since they both obtained more revenue from subsidies through OPAM by maximizing the quantities they marketed directly. The lack of information may have limited the number of merchants entering the marketplace. Another factor limiting merchant activities in the rice zones was the low import price of rice. Since merchants could import relatively freely, they preferred the lower cost imported rice to local production.

While merchants imported significant quantities of foodgrain, there was a general limitation on credit and foreign exchange, and this may have restrained some merchants from maximizing their full potential (A.I.D., 1986, p. 16). Lack of credit forced merchants to turn over their stocks rapidly instead of waiting for normal seasonal price increases. Shortages of loanable funds, caused partly by IMF and West African Monetary Union agreements, resulted in credit flowing primarily to priority customers and less risky operations. Much of the available credit was taken by the Government and state enterprises. Further, there is strong evidence that traders minimized traditional storage and resale behavior due to the risk of OPAM or other agencies depressing market prices through large and unexpected sales, often of donated food.

IMPROVING CEREAL PRODUCTION INCENTIVES

Policy Reform In order to improve incentives for cereal production, the GRM adopted two sets of policy reforms. First, as indicated above, actions were taken to legalize private sector marketing of grain offered for sale by farmers. Second, official producer prices for sorghum, millet, maize and rice paddy were raised, periodically. Under the PRMC program in 1981, the GRM agreed to raise producer prices according to a set schedule over five years; these targets were extended for the sixth year. The emphasis in this section will be on the impact of these reforms on market prices, cereals output and farmers' incomes.

Implementation Official producer price targets established at the start of the PRMC program are compared with actual official prices in Table 2. These prices increased steadily, but at a lower rate than planned. Coarse grain prices were 78 percent of target in 1986/87 and the paddy price was 70 percent. After accounting for inflation, price increases were small or negative (Humphreys, 1986).

Table 2. Official Producer Grain Prices (F CFA/kg):
A Comparison of Target and Actual Levels

Marketing Season	Millet/Sorghum/Maize			Paddy		
	Target	Actual	% Target Obtained	Target	Actual	% Target Obtained
1981/82	40	43	108 %	55	50	90 %
1982/83	46	45	98	65	55	85
1983/84	53	50	94	80	60	75
1984/85	60	50	83	90	65	72
1985/86	70	55	79	100	70	70
1986/87	70	55	79	100	70	70

Source: Humphreys, 1986, updated for sixth year extension.

With market liberalization, official prices became "intervention" or floor prices. These prices were to be defended by OPAM purchases when free market prices were lower and to be used in valuing transactions between OPAM and the Rural Development Organizations. OPAM purchasing operations to support producer prices occurred during the 1985/86 crop year and to a lesser extent in 1986/87.

Impacts

Prices Drought induced food deficits between 1982/83 and 1984/85 kept free market producer prices above official prices. In 1985/86, there was a rapid recovery in cereals output, and OPAM entered the market, purchasing a record 70,000 tons. But, OPAM exhausted its financial resources and suspended its buying operations after March 1986. As a result, there was a sharp drop in market prices, just when they would normally begin to increase, during the lean months prior to the next harvest (see Table 3). In six rural collection markets studied by MSU, there was almost no seasonal price peak, even at the height of the rainy season. (For a typical sorghum market, Zangasso, see Graph C-1 in the Statistical Annex.)

Output With the exception of high-input maize production, this team was unable to find any indications that policy reforms caused farmers to increase their production of cereals. However, there is very little farm level data to support analysis of farmers' behavior, and it is difficult to separate the effects of weather from the effects of policy reforms. Cereal production statistics are reported in Table C-1.

Table 3. Impact of Higher Official Prices and Market Liberalization on Malian Sorghum/Millet Farmers in Three Time Periods

<u>Period</u>	<u>Market Conditions</u>	<u>Impacts</u>
(1) The Deficit Years, (1982/83-1984/85)	Market prices remained above floor prices; OPAM makes limited coarse grain purchases	Farmers making sales receive high prices
(2) Bumper Year # 1 (1985/86)	Market price remains high due to massive OPAM buying; farmer stock liquidation eliminates normal hungry season price increase in rural markets	Farmers who sell 12/85 thru 3/86 benefit from unusually high market prices; later sales not so good as bottom drops out of market
(3) Bumper Year # 2	Market prices are extremely low, well into 1987	As of 1/87, with no OPAM buying, prices to farmers are very low

Incomes State buying of coarse grains at official prices had limited impact on farmers' incomes during the deficit years, 1982/83 to 1984/85, and will probably have limited impact in 1986/87. In these situations, to the extent that market liberalization reduced costs with some saving passed on to producers, there may be a small positive income effect.

In the 1985/86 marketing season, the evidence available draws heavily on the reports of the MSU team. Those data are fairly convincing that massive OPAM purchases (70,000 tons, doubling previous record) did help maintain prices in rural markets far above what they probably would have been, given supply conditions. Thus, there was a substantial, one time income transfer to farmers who sold in most rural markets between December 1985, and March 1986.

Finally, we can speculate on inter-farmer equity effects which may have occurred during 1985/86. Farmers who sold their supplies by the end of March 1986, probably did relatively better than those producers who waited for the hungry season price rise, which never came. Usually it is only larger farmers with bigger stocks who can afford the latter selling strategy; poorer farmers, normally forced into early season distress sales, followed by expensive repurchases, probably did relatively better during this year. Finally, it should be remembered that 40 percent of households did not sell any grain at all. They may have benefited as consumers, buying on a depressed market.

Causality Official producer prices are set by the Council of Ministers based on political and budgetary considerations, and an analysis of production costs conducted by the Ministry of Agriculture. There is a major question concerning the method used by the Ministry to calculate these prices. The calculations include the official minimum wage of 600 francs a day per worker. While this may be a reasonable or even conservative assumption concerning the actual costs of hiring a farm worker at peak labor periods, it certainly does not represent the opportunity cost of family labor throughout the production season, which is much lower (see Appendix B).

Most Malian families are small-scale, coarse grain producers. Their food production is limited primarily by the adequacy of rainfall, their allocation of labor and their ability to use animal traction or other yield-enhancing technologies. Most of the grain they produce is retained for family consumption. Since family food security is a priority, surpluses are often stored. Three consecutive years of drought were particularly disruptive for these farmers: many of their limited savings and assets were lost or sold, reducing their capacity to increase output. Furthermore, opportunities for farmers to capitalize on high grain prices were limited, first by the lack of surpluses during the drought and then by OPAM's inability to sustain price supports. For these reasons, the link between price and marketing policy reforms, and coarse grain output was weak. The view that sorghum and millet producers are not very responsive to price changes in the short run is supported by other studies in the Sahel (Bremer and Ellsworth 1986; Humphreys, 1986; Jaynes, 1986; Eicher and Baker, 1982; A.I.D., 1986, and 1987).

In contrast, the most positive hints of strong short-run producer responses are estimates showing large increases in high input maize production in southern Mali in 1985/86 and 1986/87. These increases appear to be due to active OPAM/CMDT maize purchasing in this area. It is too early to assess the impacts of policy reforms on rice production.

There is evidence that coarse grain farmers are responsive to market forces in the longer run. However, the potential for dramatic gains in Sahelian dry land sorghum/millet production, on a sound economic basis, is probably slim (see for example Eicher, 1984, and Matlon and Spencer, 1984, for the general Sahelian case; and Hall et al, 1983, for the Malian case). This is primarily because the "improved technology shelf" is largely bare; agricultural research has yet to provide any new varieties or agronomic practices that can economically out-produce farmer's traditional varieties and practices under low-input production conditions.¹

1. The one major exception has come in the area of mechanical technology. Animal traction can produce small but significant

Limited opportunities in sorghum and millet production, have contributed to a substantial out-migration from agriculture. The last to exit from coarse grain production are likely to be those with the most to lose. This would include those with the least opportunities in other endeavors, for instance, the poor, the elderly, women and those lacking education and non-farm skills. It would also include the most productive farmers; in fact there is evidence that many coarse grain producers have successfully adopted animal traction.

REDUCING SUBSIDIES AND IMPROVING PUBLIC SECTOR PERFORMANCE

One of the major objectives of the PRMC was to reduce the level of subsidies needed for OPAM and ODR operations. Prior to 1981, the cost of government grain marketing was very high. The GRM did not have the financial resources to continue to operate under the prevailing rules. There were compelling reasons to remain in the marketplace in a more limited way, however. The most important of these was the political necessity to continue supplying grain to civil servants and the army (the GRM's most important political constituencies) and to provide emergency food aid during periods of drought.

The following strategies were adopted to reduce the subsidy level:

- o Decrease the role of OPAM and ODRs in grain marketing;
- o Increase the allowed margin for OPAM and ODR grain marketing in the official price schedule;
- o Improve the efficiency of OPAM and ODR marketing operations.

increases in the area of grain planted per active worker by breaking critical labor constraints. But even here, most successful efforts to expand the use of animal traction have come about through the availability of a viable cash crop (particularly cotton) that can generate the substantial cash revenues required to pay for the overall adoption of animal tillage. (See Barrett et al, 1982; and Sargent et al, 1983 for more detail on the economics of traction; see Shulman, 1979 for information on the Malian CMDT case, one of the more successful in the Sahel.) Further, the current MSU research in the CMDT area indicates that once the small increases that can come from acquisition of the basic technology have been made, disposable agricultural surplus is generally channeled into lower risk, higher payoff investments in agricultural processing or non-agricultural activities such as trade (Josue Dione, personal communication).

Decreasing the Role of OPAM and
ODRs in Grain Marketing

OPAM mandates do not necessarily require it to operate in the field as a marketing entity. It could accomplish its task by making greater use of the private sector. This has been a basic strategy of the PRMC.

Policy Reform The GRM has, at least implicitly, accepted the use by OPAM of the private sector in carrying out market operations. The changes in OPAM's mandate took away its monopsony power but left it with a market-regulating role. Now, the organization's full mandate is to:

- o Ensure grain supplies for public service organizations (military, schools, hospitals, etc.) and chronically deficit zones;
- o Constitute and manage security stocks of grain;
- o Ensure respect for (official) producer and consumer prices and stabilize the cereals market; and
- o Manage food aid imports and distribution to the cercle level (a sub-regional division).

OPAM was also to purchase all grains commercialized by the parastatal regional development organizations. The ODR's were not allowed to sell to private merchants until the regulation was changed in November, 1986.

A number of the food distribution functions mentioned above are discussed in detail in the concluding part of this section, which examines impacts on consumers.

Implementation In implementing this organizational contraction, OPAM substantially reduced its truck fleet and began using private transporters. In addition, during the 1985/86 harvest, OPAM purchased 60 to 70 percent of its grain from private traders.

A major remaining problem for OPAM is that it has a large number of employees who will have no functions as more of the OPAM operations are moved to the private sector. Thus, while OPAM has reduced its workload, it is still burdened by its personnel costs. To the extent that OPAM can not deal politically with residual overstaffing, it will not realize the benefits of its reduced mandate.

In sum, while there still may be a fear of some traders exploiting or abusing windfall profit opportunities, the GRM appears open to expanding the role for the private sector, since it has clearly seen the cost of its own inefficient trading organizations.

Increasing the Marketing Margin

Under the PRMC program, one of the strategies proposed to help reduce OPAM operating subsidies was to increase the official marketing margin, or the allowable margin between the producer and consumer prices, so that more of marketing costs would be covered. Table 4 presents what has happened to these margins over the past seven years. This strategy was only really implemented in the fifth year of the program when consumer prices were increased substantially.

Table 4. OPAM Marketing Margins

<u>Year</u>	<u>Mill/Sorg.</u>	<u>Maize</u>	<u>Paddy/Rice^a</u>
1979/80	13.0	n.a.	37.2
1980/81	7.5	7.5	32.6
1981/82	15.5	15.5	34.1
1982/83	17.5	15.0	37.2
1983/84	12.5	12.5	34.1
1984/85	13.0	13.0	37.2
1985/86	40.0	40.0	58.9

Source: Bremer and Ellsworth 1986, Table 2.3.

a. The margin is 62 percent of the difference between the producer price for paddy and the consumer price for rice, to account for the transformation of paddy to rice (not accounting for the value of milling by-products).

The margin remained small until 1985/86 as the GRM wanted to keep consumer prices low, while at the same time raising producer prices. When the major increase finally occurred, it happened to be a year of abundant production. OPAM was able to purchase significant quantities, mainly, however, to support open market producer prices rather than to cash in on the new margin.

Operationally, OPAM purchased grain on its own (from producers as well as merchants) and also in collaboration with the ODRs. In the past, OPAM would pre-finance some ODR purchases and contract for other purchases with payment made on delivery. Until the 1985/86 season, the ODRs had the same problem as OPAM with deficits due to high costs and the small official margin. Subsidies for them from the national price stabilization board, OSRP, were based on the amounts of grain that were commercialized.

Both ON and CMDT have had access to credit and so did not depend solely on pre-financing from OPAM. In 1985/86, OPAM contracted with ON and CMDT for various quantities and pre-financed purchases by other ODRs. When OPAM ran out of money in February 1986, it still had not taken delivery of much of the

grain from ON and CMDT, both of which now have stocks they need to sell, but for which buyers cannot be found at the official price.

Impact on CPAM/ODR Finances

The expected financial impact of the increase in the official marketing margin has yet to materialize, as the increase was very recent and the parastatals cannot sell their stocks.

OPAM's current options for dealing with the surpluses in its warehouses are limited. If it sells on the open market it will further depress already very low producer prices and further undercut the GRM's price support strategy. If it holds on to the stocks, its capital is tied up and its losses and storage costs will continue to mount.

If the GRM were willing to accept seasonal and geographic price differentials, OPAM's transport and storage costs would be covered more fully. While this would help OPAM to some degree, the ability of the private sector to market more efficiently would still be the decisive factor. Part of the reason for these price differentials is to encourage private sector investment and expansion.

In conclusion, OPAM and the ODRs cannot win as official grain traders under the current rules of the game. A larger margin keeps them out of the marketplace or stuck with grain they cannot sell. A smaller margin would allow them to compete with the merchants but the problem of operating deficits would not be solved. To the extent that OPAM's role is as a market regulator, intervening when producer prices need to be raised, the high cost of this service will require significant levels of subsidies. A situation might arise where OPAM can intervene marginally and cover its costs due to more favorable price fluctuations; it is unlikely the GRM will have the capability to successfully plan and carry out this type of strategy and resist the inevitable pressures to deviate from plans.

Increasing the Efficiency of OPAM and ODR Operations

As seen above, the high operating costs incurred by OPAM and the ODRs imply that efficiency will be increased by encouraging the private sector to handle as much of Mali's cereals marketing as possible. The handling of emergency food aid and some grain shipping to deficit areas with inadequate purchasing power will still remain important government services, however.

Prior to PRC, OPAM's marketing activities were not viable mainly due to its size, poor management and inadequate marketing margins allowed under the official price system. In moving toward greater reliance on the private sector, the donors saw the potential difficulties OPAM and the ODRs would have in changing

their roles, and therefore promised special support if the reform program were implemented. This support would come through the use of a counterpart fund to be generated by the sale of food aid and through the provision of technical assistance.

Policy Reforms The GRM was clearly interested in taking steps to increase OPAM's operating efficiency. In the first years of the program, unit operating costs were to be reduced as rapidly as possible through tighter management, stricter control over stocks, and a smaller number of employees. Another policy reform was the use of private sector transportation and having OPAM sell off most of its large fleet of trucks.

Implementation In implementing the program, net revenue from food aid sales constituted the counterpart fund to be used, in part, as supplemental financial support for OPAM, but tied to donor conditions. PRMC food aid contributions from September 1981, through August 1986, amounted to 233,240 metric tons (or about 38 percent of total food aid contributions). The counterpart fund, the value of which has amounted to about \$90 million over the past five years, has been used for the following purposes:

- o Covering OPAM's annual deficit;
- o Supplemental food imports;
- o Interest payments by the Office du Niger for bank loans used to purchase grain;
- o Support for selected "production-incentive" activities;
- o Substitution for the GRM (OSRP) in ODR support in 1985; and
- o Financing for OPAM's price support actions.

The donors are also helping OPAM with technical assistance. France has provided a director for OPAM's accounting department and the World Bank a specialist to develop marketing systems and train OPAM staff in their use. In addition, West Germany has provided technical assistance in security stock management, the FAO in training, and the U.K. in storage technology.

Some of the results of this assistance have been:

- o The development of better management systems and the cleaning up of wasteful practices. Physical losses of grain were reduced from an estimated 12 percent in 1981/82 to about 5 percent in 1984/85;
- o Information systems set up by the marketing specialist to tie OPAM into regional markets;

- o Personnel reductions, although not as great as planned. Total employment dropped from 958 in 1981 to 744 in 1986, a 22 percent reduction;
- o The reduction of its transport costs by eliminating most of its truck fleet. The OPAM trucking operation had become the largest in Mali but was quite inefficient with many empty backhauls.

Most recently, in late 1986, the PRMC has been promoting a new role for the GRM in providing direct support to the private sector rather than simply allowing their existence. This support is now materializing through the use of PRMC counterpart funds to finance commercial credit programs for private grain traders, but it is too early to see results.

Impact on OPAM

OPAM has succeeded in significantly reducing its costs of operation. Its operating deficits were slowly reduced from 1980/81 to 1984/85 as follows (in millions of F CFA):¹

<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	<u>1983/84</u>	<u>1984/85</u>
2,651	1,613	1,424	1,360	953

Subsidies were provided in response to the deficits as follows:

	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	<u>1983/84</u>	<u>1984/85</u>
OSRP	1,362	750	847	544	36
PRMC		672	452	690	615
Other ²	388	190	125	156	322
Total ³	1,749	1,612	1,423	1,390	973

1. OPAM reported its deficit for 1984/85 to be 616 million rather than 953 million. The table is drawn from table 3.7 of the March 1986 USAID evaluation report.

2. Includes subsidies from the National Committee for Assistance to Drought Victims (CNAVS) and National Security Stocks (SNS).

3. The figures for 1981/82 and 1982/83 are very close to the deficit calculated for OPAM. The difference is that the deficit figures are USAID calculations while the subsidy amounts are to meet the deficit that OPAM reported it had.

The reductions in the cost of transport can be seen by the ratio of transport expenses divided by total sales:

<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	<u>1983/84</u>	<u>1984/85</u>
16.2%	17.9%	9.1%	8.5%	7.4%

Although OPAM has made progress in reducing its cost of operations, most observers, as well as the OPAM Director General, are in agreement that the organization still has a lot of improvement to make. The staff is still too large and productivity is low.

An analysis of OPAM marketing costs by Bremer and Ellsworth has shown that OPAM has a high level of fixed costs relative to variable costs. Thus, the more grain OPAM markets, the more the fixed costs can be spread out and the lower the cost will be for each ton. Total OPAM cost per ton of grain marketed in 1984/85 was 50,900 F CFA, while the margins prevailing in the private sector were estimated to be about 30,000 F CFA.

The characteristics of the current system appear to benefit the private merchants. They should be able to dominate the domestic rice market as they dominate the coarse grain market, particularly if they can buy from farmers at lower than official prices when market conditions warrant. The interest of OPAM in maintaining an orderly open market is seen in its intention to keep its stocks of grain off the market until existing supplies on the market are diminished.

Causality The close contact between the PRMC donors and the GRM facilitated the policy reform process. The expressed intention of the donors to cover any GRM losses during the transition to greater private sector participation may have helped to assuage some of the parastatals' fears. The current reversal of OPAM's deficit reduction was paradoxically caused, in large part, by attempting to meet another PRMC objective, producer price support. Also to blame, was the GRM's failure to impose agreed-upon import tariffs.

The value of the reduction in OPAM personnel already accomplished was less than the number of employees dismissed indicates. Those dismissed were mainly drivers and mechanics who had been needed to operate the large fleet of trucks. These were mostly low-paid employees not on permanent hire. The civil servants who were paid the higher salaries were untouchable unless they had been caught stealing.

Emergency food assistance activities have a high cost attached to them and, while greater efficiency is possible, they cannot be expected to become self-financing unless food aid is monetized and the proceeds used, at least in part, to support the distribution operation.

The two consecutive high production years have created considerable confusion as the strategy for the transition to open markets was planned with deficit production in mind. It is not clear what the long-term effects of the transition will be once production drops to lower levels, as it certainly will.

The increase in the margin allowed for OPAM sales may encourage OPAM to take a more active role in the marketplace once its current crisis is over. However, the ability to obtain large quantities and then find a demand for them will depend on the relationship between the official price and the open market price at the producer and consumer levels. Since the profit potential will depend on a large allowable margin, it is unlikely that the official consumer price will be low enough or the producer price high enough for OPAM to operate in this manner. As long as the private merchants can operate at a smaller margin, OPAM will lose at one end of the scale or the other.

POLICY REFORMS AND IMPACT ON CONSUMERS

Because of the variability of food production in Mali, food security is highly vulnerable. Thus, the fourth policy reform objective is to make consumers secure in their ability to purchase or acquire adequate food supplies. Two strategies to increase individual food security are to increase food production, and to increase incomes. Strategies to increase farm output and income are discussed above. Strategies to boost incomes outside the cereals sub sector are beyond the scope of this report. In addition, three consumer oriented strategies to enhance food security are discussed below:

- o Liberalize cereals trade to increase access and reduce costs;
- o Regulate cereals markets to protect consumers from excessive prices; and
- o Provide a safety net by ensuring food supplies to deficit areas.

Use of The Private Sector To Provision Consumers

Policy Reforms One of the strategies to enhance food security has been to increase consumers' access to supplies and to reduce marketing costs by liberalizing cereals trade. With respect to consumers, market liberalization in Mali had the following effects:

- o It increased market efficiency;

- o It increased consumer purchases in the private sector when prices were favorable;
- o It increased private cereal imports, thus contributing to available food supplies.

Impact Liberalization increased market efficiency by reducing search and transactions costs for consumers as well as producers and traders. Thus, consumers probably benefited from the legalization of private cereals trade, through improved access to supplies and lower costs of supplies. This view is supported by Jaynes (1986), and Dione and Dembele (1986). The absence of cereals seizures and the reduction in harassment by authorities, as well as a reduction in clandestine trading activities, all provide circumstantial evidence of a decline in the difficulties faced by consumers in acquiring grain, and thus, a probable reduction in their costs.

Initially, the effect of liberalization on the volume of private market purchases was relatively small. As we have seen, marketed surplus of cereals is small and OPAM marketings are just a small fraction of that, except for rice. Importantly, OPAM continues to handle the sale and distribution of food aid. With domestic food shortages caused by the drought of 1982/83-1984/85, open market prices remained above official consumer prices, and food aid in flows increased. These factors mitigated against increases in consumer purchases from private traders.

After the 1985/86 bumper harvest, however, domestic supplies increased and prices fell, attracting consumers into the open market. OPAM sales and distributions dropped by 71 percent between 1984/85 and 1985/86. Thus, consumers were able to benefit from liberalization through increased free market purchases at lower-than-official prices.

After liberalization, private cereal imports, primarily rice, increased substantially. Liberalization probably promoted this increase and thereby helped to hold prices down. Since late 1986, the GRM has attempted to curtail private rice imports. To the extent that it is successful, the GRM will be assisting OPAM and the ODRs to recoup part of their expenditures from earlier rice purchases, but at the possible expense, in the short run, of private importers and consumers.

In summary, consumers and importers alike responded to price differentials. Consumers with continued access to OPAM's supplies only switched to private traders in late 1985, when free market prices fell below official prices for the first time in many years (see Graph C-3). Importers responded to differentials between domestic and international prices, particularly during the drought, by importing cereals.

Price Stabilization

The cereals market restructuring program vested OPAM with the role of intervening in the open market to protect consumers from excessive prices. In order to assess the impact of price stabilization policy reforms on consumers, it is necessary to look first at the implications of increases in official consumer prices.

Policy Reform The PRMC program called for gradual increases in official consumer prices, in order to reduce the financial losses of CPAM and to provide profitable opportunities for private traders (see above).

Implementation On three occasions, consumer prices for cereals were increased. However, price increases lagged behind those originally stipulated in the PRMC program, with the exception of the rice price which met the target for 1985/86.

Table 5: Actual and Targeted Official Consumer Prices (F CFA/kg.)

Year	Coarse Grains		Rice	
	Target	Actual	Target	Actual
1980/81	42.5	42.5	100.0	100.0
1981/82	52.5	58.0	110.0	115.0
1982/83	62.5	62.5	120.0	125.0
1983/84	81.0	62.5	135.0	125.0
1984/85	95.0	62.5	150.0	125.0
1985/86	110.0	95.0	165.0	165.0
1986/87	----	95.0	-----	165.0

Source: PRMC.

Impact

The increases in official consumer prices reduced the consumer subsidy element in OPAM's sales and adversely affected those consumers with access to OPAM supplies. These consumers were subsidized during the 1981/82-1985/86 period to the extent that official prices were below free market prices. The increases in official prices diminished these subsidies. The November 1985 increase in official prices, combined with falling free market prices, eliminated the implicit subsidy to consumers with access to OPAM supplies, but this was offset by the benefits of lower free market prices.

To assess the distribution of benefits from OPAM consumer subsidies, it is necessary to look at the pattern of OPAM's sales. Data on the ultimate recipients of OPAM sales and

distributions are limited. However, it appears that the gains from subsidies were unevenly distributed, favoring the military, civil servants, the more influential members of cooperatives and, in general, urban rice consumers. This is largely consistent with OPAM's mandate to ensure grain supplies for the "Service d'Utilite Publique." (SUP).

Since the PRMC program began, 26 percent of OPAM sales have been in the Bamako market. The SUP receives 28 percent of Bamako sales. An additional 23 percent is distributed to privileged individuals, particularly high government officials. Increasingly, OPAM's distributions in Bamako are going to consumer cooperatives, which receive over 50 percent of Bamako distributions. These cooperatives have preferential access to credit which encourages their purchases from OPAM. Recent evaluations of PRMC activities indicate that food distributions through cooperatives tend to benefit a minority, composed primarily of cooperative officials and private traders (Amselle, Thienvin and Yung, 1986). Rice constitutes over 60 percent of sales in Bamako, even though rice is more costly and is consumed primarily by persons who are relatively well off. On a national basis, 53 percent of OPAM sales have been in rice. Furthermore, OPAM's domestic purchases and commercial imports have been heavily weighted towards rice.

The official consumer price increases of 36 and 8 percent for coarse grains, and 15 and 9 percent for rice in 1981/82 and 1982/83 were products of lobbying by the PRMC donors. During the ensuing three years, the GRM was reluctant to change prices for political and financial reasons. Mali's IMF stand-by agreements required the government to meet targets relating to government finance and inflation. As a result, wages for the civil service were frozen for a period of three years. Since 40 to 50 percent of OPAM's sales were to civil servants (Humphreys, 1986), the GRM was compelled to consider its below-market-priced cereals as a wage good. Official price increases were inflationary and they reduced real wages of the civil servants. The PRMC donors tended to accept this logic and concurred in holding back price increases through 1984.

In January 1985, government salaries were increased by a minimum of 10 percent, and the push for further price increases began anew. However, the final impetus for the latest price increases came from the IMF's insistence that prices be raised in order to reduce OPAM's operating deficits. In 1985/86 official consumer prices were raised 52 percent for coarse grains and 32 percent for rice. PRMC donors facilitated this agreement by transferring counterpart funds to Mali's Price Stabilization Fund (OSRP). In doing so the GRM budgetary resources were released from OSRP in anticipation of future government salary increases. But these salary increases were abandoned when cotton prices collapsed in 1985.

Policy Reform The PRMC program introduced a consumer price stabilization policy. The policy provides for OPAM to sell grain in regional markets when free market prices exceed intervention prices, or trigger prices. Prior to liberalization in 1981/82, official consumer prices were command prices, subject to government enforcement.

Implementation For 1981/82, intervention prices were set at 8 percent above official consumer prices; the margin was subsequently raised to 12 percent. It was intended that OPAM would sell grain at the regional or even cercle level, when market prices exceeded trigger levels. In practice, OPAM transfers and sales of grain for this purpose cannot be distinguished from normal operations designed to provide food to deficit areas, as discussed below.

Impact

OPAM's activities had a limited impact on price stabilization. Throughout the 1981/82-1984/85 period, consumer prices remained well above official prices. There was tremendous upward pressure on consumer prices between 1982/83 and 1984/85 because of drought-reduced domestic production. During these years, OPAM managed sales and distributions of commercially imported cereals and food aid.

These additional food supplies alleviated much of the upward pressure on prices caused by domestic shortfalls. Rice prices remained stable between October 1982 and April 1984. In contrast, coarse grains volumes sold by OPAM were not sufficient to bring prices under control. Since OPAM did add to cereals availability by releasing domestically procured and imported cereals during the "hungry seasons" between 1981/82 and 1984/85, there was a net positive contribution to seasonal consumer price stabilization objectives. To this extent, all consumers buying grain on the free market benefited from this one-time income transfer.

In 1985/86, free market prices fell below official consumer prices for the first sustained period in over 15 years. This is the result of good harvests and falling import prices coinciding with increases in official consumer prices.

Despite the GRM's intention to maintain common consumer prices throughout the country, regional disparities continued throughout the 1981/82-1985/86 period (Amselle, Theinvin and Yung, 1986; and Humphreys 1986.) However, significant correlations of market prices among most regions indicate substantial spatial integration of markets (Dione and Dembele, 1986a). This suggests that price differentials reflect underlying market conditions, such as differential costs associated with supplying grain to deficit or remote areas. As would be expected, market prices tend to be higher in Tombouctou, Gao and Kayes.

OPAM's ability to intervene in the cereals market to sell grains and dampen price increases may be attributed, in part, to PRMC food aid and financial assistance. PRMC donors' provided food aid and imports were purchased with PRMC counterpart funds. These PRMC supplies exceeded OPAM sales and distributions during these three years. Market liberalization also contributed to price stabilization and private rice imports are partially responsible for the period of stable rice prices between 1982 and 1984. In addition, it is likely that private traders play a large arbitraging role amongst local markets, providing a degree of spatial stability and integration which is beyond the capabilities of OPAM itself (Dione and Dembele, 1986a). However, it is the substantial inflows of food aid for famine relief which played the largest role in keeping consumer prices down in recent years of low domestic output.

Providing a Safety Net

OPAM's new mandate in 1981 reaffirmed its responsibility for ensuring supplies to deficit areas and established a National Security Stock Program (SNS) for cereals.

A National Security Stock of 48,000 tons was constituted; the German government provided technical assistance, financed construction of storage facilities and pest control, and donated 38,000 tons of grain. Other PRMC donors contributed 10,000 tons. The SNS is currently being enlarged.

In October and November of each year since 1981, OPAM has issued "Food Supply Plans," including domestic production estimates, food consumption requirements, domestic stocks, and estimates of private commercial imports and food aid contributions. These "Plan's" then set OPAM's operational targets for domestic procurement, commercial imports, food aid, and regional distribution activities.

The SNS was drawn down during the drought years of 1982-84. Stocks were replenished through additional food aid contributions and domestic purchases, partially funded by PRMC. Aggregate food supply targets in the "Food Supply Plans" were not always satisfied between 1981/82 and 1984/85. Free food distribution in deficit zones rose dramatically during the 1982/83-1984/85 famine. Although much of the food aid to support these programs was provided outside the PRMC rubric, the development of a strong donor-GRM collaboration, fostered by the PRMC, certainly contributed to the timely delivery of emergency food aid. Use of National Security Stocks and distribution of food to deficit areas contributed a measure of food security and contributed to the alleviation of hunger and starvation.

IV. CONCLUSIONS

ASSESSMENT OF CEREALS MARKETING REFORMS

On balance, policy reforms have had a positive, but limited, impact in Mali. The most significant gains for the economy as a whole come through gains in market efficiency, particularly from the cereals market reforms. Producers, traders, and consumers are probably better off because of freer markets for coarse grains and rice. Also, several economies have been realized in public sector cereals marketing operations. Greater gains from market reforms may lie ahead. Rice trade was decontrolled only recently.

Policy reforms also resulted in financial transfers within Mali's cereals sub-sector. Price policy reforms led to a shift in subsidies, from consumers to producers. The private trading and transporting sector has benefited from decreased interference and increased use of private marketing. Central to all of this has been the willingness of the multi-donor community to provide food which kept consumer prices within reasonable levels and to use the generated counterpart funds to finance OPAM's consumer subsidies and price support activities.

It does not seem on the basis of existing data that policy reforms had the desired effect in three critical areas. First, no link has been established between increases in cereals production and policy reforms. Second, although farmers' incomes probably increased, it is not possible to disentangle the incentive effects of policy reforms from improvements caused by the weather. Third, variability in domestic cereal production overwhelmed the public sector. It was barely able to stabilize consumer prices as expected during the drought years, although some stability in rice prices was achieved. When cereals output rebounded in 1985/86 and 1986/87, the public sector was unable to sustain its buying operations. Despite earlier gains in cutting OPAM's operating deficits, storage costs mounted and OPAM was unable to sell under prevailing price policies.

PRESSURES ON THE GOVERNMENT OF MALI

The Government of Mali adopted the PRMC program in the face of severe financial difficulties and strong prompting by the IMF and donor community. But, the program called for the dismantling of policies which have benefited the most powerful political constituencies-- the civil service, the military, the urban cooperatives and the rural development organizations. Mali could not sustain its past policies of low cereals prices and government control of food markets. Nor could it immediately reduce public sector employment and abandon price subsidies for privileged urban consumers. Macroeconomic stabilization measures

were eating away at real incomes in the urban sector. In the end, donors accepted postponement of critical reforms in prices, rice marketing, and employment reduction, during the first six years of the PRMC program.

DONOR COORDINATION AS CONSENSUS

The PRMC is rightly celebrated as a successful exercise of donor coordination in an imperfect world. A number of bilateral and multilateral donors have been taking a coordinated set of actions in consultation with, and in support of, the Government of Mali. The donors have exhibited a serious commitment to consultation and consensus building in directing their assistance. This approach has provided considerable flexibility in reacting to volatile financial and food supply conditions. However, this emphasis on coordinated action has obscured fundamental differences among donors on underlying reform objectives and strategies. The most critical issues concern price policies and the appropriate role for the public sector in cereals markets.

CRITICAL ISSUES: PRICE POLICIES AND MARKET STRUCTURE

The weaknesses of pricing policies adopted under the PRMC program were exposed by the abrupt shift to a domestic surplus situation in 1985/86. It is clear that Mali cannot sustain a policy of unlimited purchases of domestically produced cereals at rigid, official support prices. There is a lack of consensus among donors as to whether Mali should support producer prices at all and, if so, what the decision rules for Mali's intervention should be. As a result, there is not a consensus on the proper role of the state grain marketing board, OPAM.

The view of the members of this assessment team is that continued intervention by the GRM to provide incentives to producers is desirable, but that a more limited and flexible intervention must be designed. This intervention must be in line with available financial resources, since it will inevitably carry a fiscal cost. It must be financially viable so as to be credible if it is to have an impact on producer incentives.

The team recommends that, if official prices are to be maintained, rigid pan-territorial and pan-seasonal pricing be dropped and that the price of maize be set separately from the price for millet and sorghum.

AN OPENING TOWARD THE FUTURE

The time seems ripe to begin to direct a greater proportion of PRMC energy and resources to further development of private trade in the cereals sub-sector. The current USAID initiative to provide the private sector with a line of credit, opening the capital market to smaller merchants, is a promising initial step.

Appropriate public sector investments could help reduce the costs inherent in private trade in Mali. These include developing market information and transportation infrastructure, increasing access to working capital, and human capital investments. Furthermore, OPAM and other GRM institutions must develop more flexible and less disruptive intervention strategies if they are to improve the performance of the market. Finally, the data collection and analytical capability to redefine options for market intervention and to evaluate the potential effects of public investments must be improved and used more rigorously by the Government of Mali.

APPENDIX A

METHODS FOR FUTURE POLICY REFORM ASSESSMENTS

INTRODUCTION

The current effort to assess the impact of policy reform efforts in Africa, and in this case in Mali, has demonstrated the difficulty of conducting this exercise given the frequent lack of necessary data and studies. Here we reflect on some of the methodological lessons which may be gleaned from the Malian experience and help in future assessments.

The lessons from Mali will be generally applicable to the French speaking countries of the Sahel which share an ecological similarity and a common institutional and policy heritage (See Wilcock, 1978). There also may be application elsewhere in Africa but more caution would have to be exercised.

Attempts to conduct this type of assessment will always face unusual measurement difficulties in the Sahelian environment due to two basic factors. One, data collection will always be a scarce luxury in this environment. Two, extreme variability will continue to characterize supply and demand conditions in the cereals sub-sector because of a) highly variable, weather-induced supply conditions for the primary dryland sorghum and millet crops, and b) continued instability in world grain prices and food aid availability. This variability simply means that it will always be difficult to trace causality.

Assessment is always easier when there is a clear definition of reform program objectives, program actions, and predefined impact indicators. These should be carefully defined at the beginning of the program. In Mali, we have seen that the objectives of the PRMC program were not defined particularly clearly in its first phase. However, the donors do seem to be making a clear effort to remedy this situation for the Phase II of the joint PRMC program.

Finally in introduction, the Mali case presents a unique opportunity to examine agricultural policy reform assessment; this is the objective of an ongoing Michigan State University Food Security Project micro-level research effort. In fact, the two principal investigators in this effort, Professor John Staatz and field research supervisor Josue Dione, are planning to produce a book describing this particular experience in the development of field assessment methods.

METHODOLOGICAL SUGGESTIONS BY IMPACT AREAS

Impacts on Producer Response

In the Phase I period, the effort to assess impacts on producers is complicated by the virtual total lack of relevant data. Second, and more fundamentally, short-term planting and other production decisions in the highly precarious environment for dryland sorghum and millet in the Sahel are characterized predominantly by risk reduction survival strategies rather than by responding to market price signals.

In Phase II a number of improvements could be made in this situation. First, the overall effort to assess impact would be substantially easier if the collection of basic, recurrent statistics were improved. New approaches being tried using very focused, mobile team techniques in collecting basic production data on a sample basis would have high payoffs in the Sahelian environment. These methods place great reliance on simply asking farmers how much grain (or other crops) they produced. Various data collection tests have shown these methods to produce results that are at least as good or better than the traditional yield plot approach (and much better than the "office meeting" estimation techniques often used in the Sahel).

Even if no improvement is made in basic agricultural data collection, there are low cost ways to get a better picture of marketing reform impacts on producer incentives. First the problem needs to be simplified and subdivided by time period and by crop. By time period we need to distinguish between short term reactions to recent prices on the next season's production decisions and longer term changes (over a three to five year period) to adopt higher yielding technologies. Next, the investigations need to distinguish among crops: dry land sorghum and millet, maize (either traditional compound maize or maize grown with chemical fertilizer for the cash market), and finally different types of rice production (total water control as in the "Office du Niger," rainfed rice, and flooded floating rice such as is planted along the Niger and which may only produce a crop in one year out of four). Response to market price changes would be only one of a number of factors affecting technology adoption to be examined. The following are four types of production response studies which could be done in Mali (most could be done in other Sahelian countries as well) in the future:

Short-Term Planting Intentions for Sorghum and Millet A one-shot survey could be done which would directly ask farmers questions on how they determine acreage of grain to plant, and how mid-season weeding and post-harvest marketing decisions are made. The current USAID/Mali farming systems project or the MSU data collection team could do such a small study.

CMDT High-Input Maize Study A short study should be done of available secondary data on CMDT farmers growing and marketing high-input maize. The analysis of secondary could be followed with a rapid reconnaissance type survey of a sample of CMDT maize growers stratified by use of animal traction, whether cotton is grown, etc. It would be easy to do this in the high extension coverage area of CMDT in the dry season.

Rice Production and Marketing Study (if this has not already been done). Basic information on the major rice production system in Mali: total water control irrigation, rainfed rice (particularly in Sikasso area), and riparian, floating rice along the Niger. Existing information and studies need to be consulted first (such as work of the WARDA group in Mopti) then rapid reconnaissance survey could be done in the major production areas. Key questions: rough cost of production and yields, marketing patterns, response to market prices. WARDA might help with this on a low cost contract basis.

Longer-Term Producer Adoption of Improved Dry Land Sorghum Millet Technologies It would be useful to sort out, perhaps with the help of the AID-funded ICRISAT/Mali research team, to what extent Malian producers seem to have adopted any improved techniques for producing sorghum and millet under dry land conditions. This could involve mechanical technologies (animal traction-update Shulman/USAID study; different agronomic techniques, green manuring, etc.); biological technologies (Are there any improved varieties, with or without fertilizer?); and chemical technologies (including fertilizer, and herbicides). If there has been some adoption, how and why did producers start using the technologies? (Direct questions to adopter farmers).

Impacts on Efficiency in Market Channels

There are indications of major cost reduction in the market channels between the farm gate and the consumer due to the liberalization portion of the PRMC reform package. These need to be examined more systematically, first by the MSU team currently in the field and perhaps by some well-focused follow-up studies. These approaches would have wide applicability across the Sahel. There are two reasons why the impacts occurring in market channel efficiency have not received much attention. First, there is almost no reliable information on real costs of grain marketing through the channels (in Mali private trade was illegal and

logically, could not be studied) and secondly, views of transactions are often just partial: farm gate to wholesale or the cost of distribution from wholesale bulk stocks to consumers. What is needed is to look across the whole grain marketing channel over time (are there changes between deficit and surplus years?) and over space (do channels serving Bamako, Gao and Mopti work substantially differently?).

Residual Functions for State Trading Agencies

The subsidy reduction impacts within OPAM are perhaps the most visible and easiest to quantify of all impact areas examined in this assessment. As we have seen, care must be taken in attributing causality, even with these clearer indicators. For example, it was easier for OPAM to cut expenses in the first three or four deficit years when a major function was to distribute food aid. Once conditions changed to surplus, the gains made rapidly disappeared. In other words, measures of efficiency and cost reduction need to be defined with respect to alternative market conditions.

Currently, OPAM needs assistance in defining alternative decision rules and procedures to respond to different possible supply and demand situations both within and outside Mali. Much of this can be done on a relatively informal, accounting model basis which would simply take account of production, public and private stocks, commercial pipeline imports, food aid, and consumption figures. Obviously close "early warning" monitoring of the domestic coarse grain production situation and the world rice situation would be most important.

At the regional, Sahelian level, there is a great opportunity to examine the change which has occurred in grain marketing institutions and activities in the 10 years since the Elliot Berg group looked at the subject in 1976/77. We know already that major institutional changes have occurred across the region and there may be opportunities to examine certain data series within a 10-year perspective.

Consumer Impacts

In contrast to a developed economy where 3 or 4 percent of the population feed the rest and where the distinction between consumer and producer is somewhat clearer, these distinctions are often blurred in the Sahel. The first question that must be addressed, therefore, is which consumer groups we are talking about. The consumers who are also producers? Urban populations: urban unemployed or relatively well-off civil servant groups? Next, the relevant performance measures which apply to these different groups must be more clearly defined.

As in everything else, there are no data. The lack of consumption studies is perhaps even more chronic than the lack of reasonable agricultural production statistics. Currently in Mali a group from Tufts University is analyzing data from an urban consumption survey which may provide some interesting clues as to individual patterns of expenditure and incidence of benefits. Further studies of this kind should be encouraged along with focused studies of food distribution by consumer cooperatives and other urban groups.

Data Collection and Policy Analysis
Capability Must Be Institutionalized

Perhaps one of the greatest shortcomings of the PRMC program, and related donor efforts is the lack of institutionalization of necessary basic data collection and policy analysis capabilities. While some progress has been made in improving data collection within OPAM (some market price information and improvements in management data collection), most of the key data which could be used to evaluate the program and to plan annual grain marketing strategies was being collected by ad hoc donor-sponsored efforts, such as the much praised MSU effort. There has been a near total lack of attention paid to institutionalizing this capacity within the Malian government. This is particularly true of the development of the Malian capacity to analyze relevant policy options. This is in contrast to policy reform efforts in other countries where part of the assistance has gone into efforts to gradually beef up the analytical capability, which in turn creates a demand for better data since it can be shown that data collection has a practical and important consequence.

APPENDIX B

OFFICIAL PRODUCER PRICE CALCULATIONS

There is a major question concerning the method used by the Ministry of Agriculture to calculate proposed official prices. Supposedly they are based on the farmer's cost of production. The calculations include the official minimum wage of 600 francs a day per worker (for the latest version see MOA, IER, 1986). While this may be a reasonable or even conservative assumption concerning the actual costs of hiring a farm worker at peak labor periods, it certainly does not represent the opportunity cost of family labor throughout the production season, which is much lower.

The table below illustrates two alternative prices based on costing low input sorghum/millet labor at 600 and 300 F CFA per person day of labor. It is of interest to note that 70 F CFA/KG was the price proposed in February 1986. Fortunately, it was not accepted. Changing the labor rate from 600 to 300 F CFA per person per day drops the breakeven price from 70 to 40 F CFA a kilo. Similarly, if we were to increase the assumed yield by 50 percent to 900 kilos per hectare (reflecting good 1986 harvests) and reduce the labor rate, price would fall to around 29 F CFA per kilo (a bit lower than market clearing prices in January 1987 in the Sikasso area for example).

IER Breakeven Price Calculations
Using Alternative Daily Labor Rate Assumptions

	Daily Labor Rates	
	600 FCFA/day	300 FCFA/day
1. Total Cash Production Costs (Seeds, hand tools, fungicide) F CFA/ha	1,050	1,050
2. Labor: 61 days/ha (F CFA/ha)	36,600	18,300
3. Total Costs/ha (1+2)	37,650	19,350
4. Yield (kg/ha)	600	600
5. Profit Margin (7.25 F CFA/kg)	4,350	4,350
6. Total Costs & Profit (3+5)	42,000	23,700
7. Breakeven Price (6/4) (F CFA/kg)	70	39.5

Source: MOA/IER, 1986

TABLE C1

MALE: TOTAL PRODUCTION - COARSE GRAINS AND PADDY, 1960-1986
('000 tons)

	<u>Coarse Grains</u>			<u>Paddy</u>
	<u>Millet/ Sorghum</u>	<u>Maize</u>	<u>Total</u>	
1960	833	85	898	160
1961	828	70	898	145
1962	867	88	955	200
1963	863	100	963	189
1964	946	107	1,053	192
1965	880	88	968	162
1966	809	101	916	162
1967	830	98	928	160
1968	757	91	848	84
1969	913	73	986	119
1970	758	84	840	168
1971	691	87	778	171
1972	824	44	668	116
1973	660	63	723	130
1974	800	100	900	250
1975	800	70	870	218
1976	900	80	980	237
1977	800	50	850	199
1978	1,000	55	1,055	251
1979	943	64	1,007	165
1980	654	73	727	165
1981	858	75	931	176
1982	795	95	890	129
1983	663	95	758	122
1984	521	73	594	104
1985	1,200	204
1986	1,531	249

Source: Humphreys, 1986 -- with updates.

TABLE C2

MALI: FARM COARSE GRAIN PRODUCTION AND DISPOSAL IN CMDT/OHV
PRODUCTION AREAS BY TYPE OF FARM EQUIPMENT, 1985-1986

<u>Zone & Equipment Level</u>	<u>Production (kg's)</u>		<u>Net Disposals (out less in, in kg)</u>		<u>Total Out at % of Prod.</u>	
	<u>Total</u>	<u>Per Capita</u>	<u>Sales</u>	<u>Gifts</u>		
CMDT/OHV SOUTH						
Fully Equipped with AT	5,982	342	628	389	1,017	17%
Partly Equipped: Surplus	4,293	335	283	196	479	11
Partly Equipped: Deficit	1,953	178	-167	118	-49	-3
No Animal Traction	1,252	179	-96	20	-76	-6
Total All Farms	3,519	288	203	191	394	11
CMDT/OHV NORTH						
Fully Equipped with AT	3,907	174	-33	189	156	4%
Partly Equipped: Surplus	2,093	138	-51	107	56	3
Partly Equipped: Deficit	1,438	130	-480	70	-410	-29
No Animal Traction	1,002	113	-184	52	-132	-13
Total All Farms	2,399	153	-152	ii8	-34	-1%

Source: Dione + Diembele, Aug. 1986 (MSU No. 3) and supplemental tabulations.

TABLE C3

FIRST ESTIMATE OF NATIONAL CEREALS
BUDGET FOR MALI, 1986-1987
('000 tons)

Situation as of Oct. 15, 1986

	<u>Rice</u>	<u>Coarse Grains</u>	<u>Total</u>
<u>Supply</u>			
Gross Production	249	1,531	1,780
Disposable Production*	127	1,291	1,418
<u>Stocks</u>			
OPAM	35	69	104
PVO's	1	7	8
Private Commercial	25	3	28
National Security		41	41
Food Aid Remaining	11	10	21
<hr/>			
Sub-Total Stocks			
<hr/>			
Total Supply	199	1,421	1,620
<hr/>			
<u>Demand</u>			
Consumption**	217	1,230	1,447
National Security Stock		58	58
OPAM Stocks	15	5	20
<hr/>			
Total Demand	232	1,293	1,525
<hr/>			
Net Position	-33	128	95
Plus Pipeline Imports	29	0	29
<hr/>			
Find Net Position	-4	128	124
<hr/>			

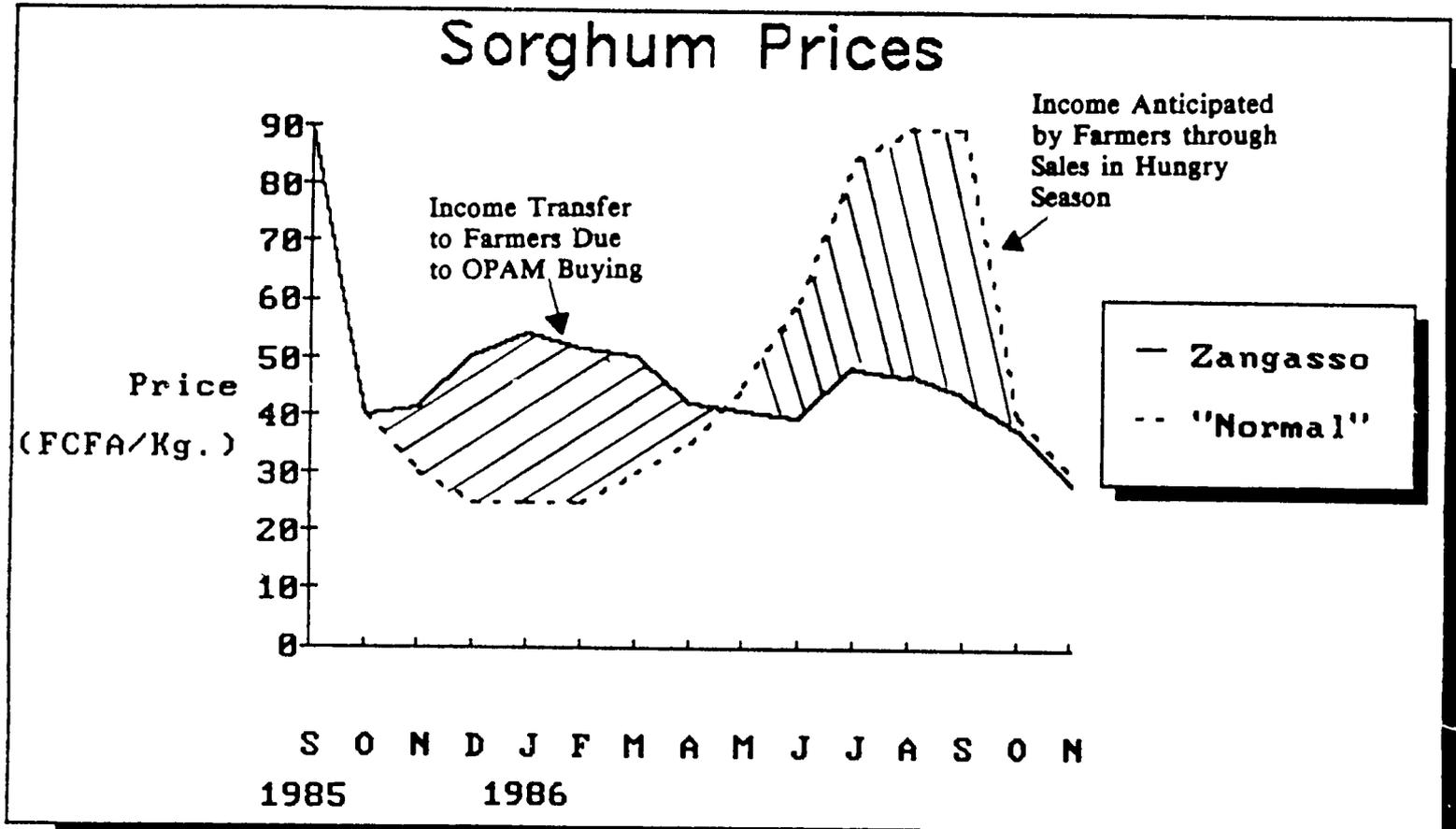
Source: Early Warning Units, CNAV§ BAMAKO

Notes:

- * Disposable after milling, losses and set aside for seed needs.
- ** Consumption estimated on the basis of 167 kg/person.

GRAPH C1

COMPARISON OF SORGHUM PRICES ZANGASSO MARKET, MALI WITH "NORMAL PRICES MOVEMENT,"* SEPTEMBER 1985-NOVEMBER 1986



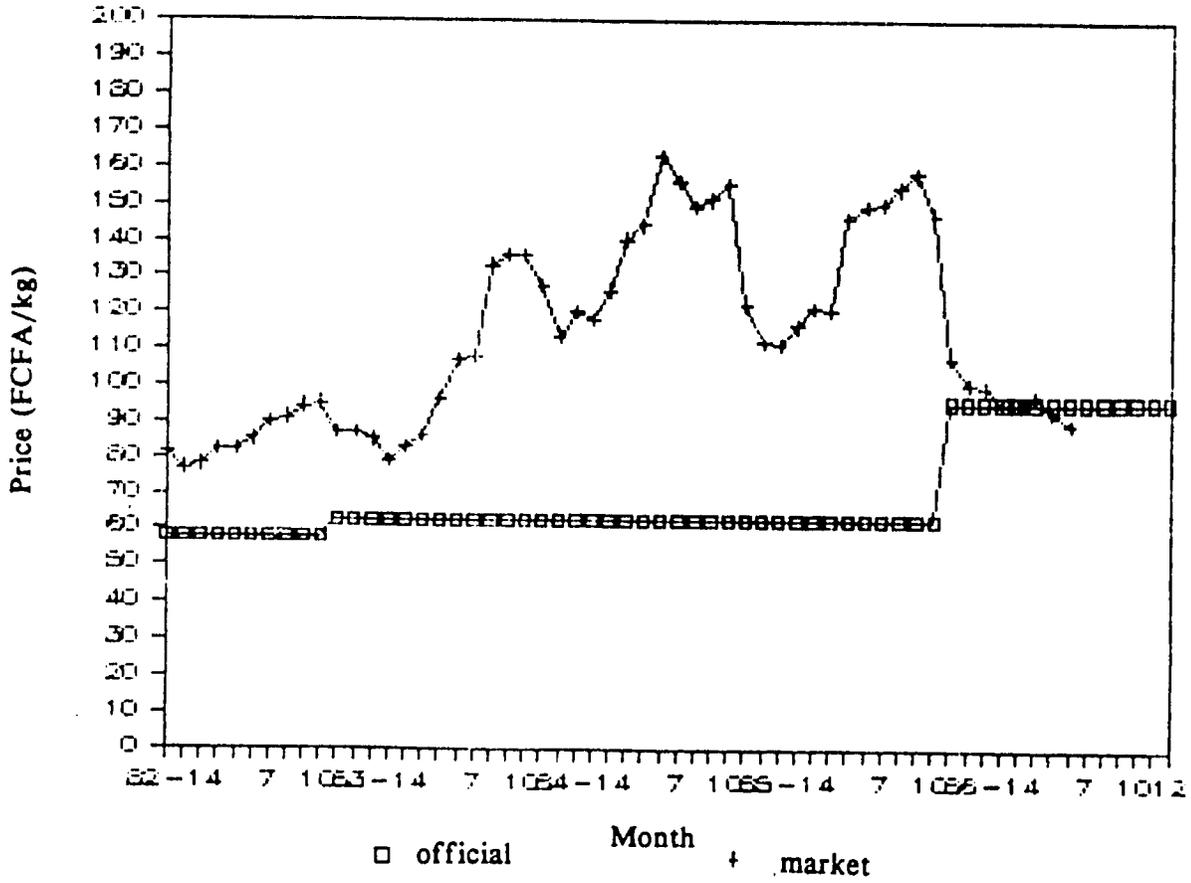
Source: MSU Food Security Project Mali: Market Price Collection Component, Special Tabulation.

* The "normal" price curve is simply an assumed curve based on historical seasonal price movements in Mali.

Notes: The pattern of prices for sorghum in Zangasso was repeated in a similar fashion for sorghum and millet in the other markets where MSU data collection is taking place.

GRAPH C2

OFFICIAL AND BAMAKO MARKET PRICES FOR MILLET, 1982-1986
(FCFA/kg)



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