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NATIONAL FOOD SECURITY STOCK POLICIES AND PROCEDURES IN SUB-SAHARAN AFRICA

Case Studies

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NATIONAL FOOD SECURITY STOCK POLICIES AND PROCEDURES IN SUB-SAHARAN AFRICA

Case Studies

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for the

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EXECUTIVE SUMMARY

The findings in the four case studies on Chad, Malawi, Mali, and Zambia exemplify the wide diversity of national food security stock policies and procedures being followed currently in sub-Saharan African countries. For each of the case studies, the food security objective, food security management organization, utilization practices for the food security stock, food security information/early warning systems, food security stock maintenance and pest control measures, and the impacts of the stocking policy were found to be very different.

Chad's food security stock policy of providing famine relief to those disaster-stricken, is managed cooperatively by the Government of Chad and the international donors. The emergency food aid management group, CASAU, using especially the information from the early warning system (SAP and FEWS), makes recommendations to the CSSA. The actual decisions regarding the use of food aid for famine relief are made by the Security Stock Subcommittee (CSSA) since the CSSA is dominated by those donors who have contributed food aid in kind or in funds. Although ONC, a Government parastatal, was unsuccessful in its attempt to manage a grain price stabilization program, it has been able to maintain the national food security stocks (targeted at 20,000 metric tons) to the satisfaction of the donors who contribute to it. In recent years, famine has been averted through the efficient distribution of the security stock by CARE and WFP and with the help of emergency donations. Building and maintaining the security grain stocks in Chad has been the burden of the international community, and it now rests heavily on USAID's shoulders.

Malawi's food security stock objective is to have maize stocks readily available for needy rural Malawians who have lost crops due to drought or flood, to fill the commercial food gap and to stabilize prices, and to provide food aid to the Mozambican refugees if donor pledges are not sufficient. The Food Security and Nutrition Unit, using information from the Agricultural Development Divisions, the Ministry of Agriculture, and the Agricultural Development and Marketing Corporation (ADMARC), initiates any request to use the strategic grain reserve (SGR). Any drawdown of the SGR must by recommended by the Food Security and Nutrition Advisory Committee and must be approved by the Secretary of the Office of the President and Cabinet.

ADMARC, a non-government organization that has its own commercial commodity operations, is responsible for non-commercial activities such as maize price stabilization and maintaining the SGR (targeted at 180,000 metric tons of maize) in silos in Lilongwe. Because of its dominant position as buyer and seller in the maize market, ADMARC is able to stabilize the maize market using its working stocks and, if absolutely necessary, borrowed stocks from the SGR. ADMARC is a large, tightly-run organization that is capable of maintaining reserve grain for more than two years in acceptable condition. Although ADMARC has not been reimbursed by the GRZ for expenses incurred in some of its non-commercial operations, e.g., maize price stabilization, the total annual cost to ADMARC of maintaining the SGR and the silos has been reimbursed by the Government of Malawi. To formalize the agreement between the GRZ and ADMARC in terms of the GRZ's financing/reimbursing ADMARC's non-commercial operations carried out on

behalf of the GRZ, a Memorandum of Understanding (MOU) has been put in place. The MOU may place ADMARC in a better position financially. On the other hand, the MOU may also benefit the GRZ by giving the GRZ more control on the costs of the non-commercial operations performed by ADMARC.

Mali's food security policy is based in part on a recently introduced program of strengthening the private sector through market liberalization. The objective of the reserve policy is to maintain enough grain in strategic locations within the country to supply vulnerable groups until food aid arrives. The anticipated delay between the call for assistance and the arrival of food aid is about three months, and the target level for the reserve stocks is 39,000 mt. Private merchants are expected to supply the market under normal circumstances, and the early warning system is expected to anticipate shortages.

The security reserve stock is under the control of the PMRC, a committee of donors that meets weekly to discuss the program of market reform. An interministerial committee of the GRM supervises the PRMC, but the donors exert de facto control because reserve grain is not distributed until a replacement pledge has been made, and only donors have the resources to replace the reserve. Using information supplied by the early warning system, the market information system, and the CNAUR, a government organization that focuses on at-risk groups, the PMRC plots the success of the market reforms, recommends adjustments, facilitates actions based on anticipated food shortfalls, and coordinates food aid pledged by various donors.

As the Malian market was liberalized under the PMRC plan, the parastatal marketing board, OPAM, was reduced in size and scope. Currently, its main function is to maintain the security reserve stock. It does so with the strong technical support of a program funded and run by the Federal Republic of Germany. Because of that project, Mali is unique among countries studied in that it has a network of special warehouses and procedures used only for security reserve grain.

The food security system has been successful in averting major food crises, but the cost to donors has been high. Donor contributions to the PMRC since it was formed exceed USD 82 million, and the cost of the German technical assistance project alone is approximately USD 78 million. There is no indication that the GRM could maintain the system if donor support eroded.

The objective of Zambia's food security stock policy is to ensure that sufficient stocks of maize are always available to cover a seasonal production shortfall, a shortfall that may take place because of adverse weather conditions, low plantings of maize by farmers, and/or monocropping of cash crops (notably hybrid maize), and to permit the GRZ to cover special distribution requirements to vulnerable groups in drought-prone areas during years of crop failure.

The current situation relative to the security reserve stock is extremely political and fluid. Since 1989, the Zambian Cooperative Federation (ZCF), a part of the national cooperative system largely a creation of the government, has been responsible for maintaining the maize security reserve. At that time funding was made available to ZCF from the Government of Zambia to purchase, handle, and maintain a 225,000 metric ton security maize reserve. However, ZCF did not

perform this function to the GRZ's satisfaction. Instead, ZCF was accused of using the funds for its commercial maize marketing operations. Thus Zambia has been and is currently without a true security stock, and the new Government (in place since late 1991) is attempting to locate or create an alternative security stock managing organization.

The target size of the security stock is also under scrutiny. Since the Government of Zambia cannot afford the cost of purchasing, transporting, and long-term storage of the security stock maize, and since the national early warning system is well developed and now capable of projecting stock needs much earlier in the crop/marketing year, the reserve may be downsized. Even Zambia's maize marketing policies are under great scrutiny. The large subsidies given to both producers and consumers, and the consequent lack of incentives for the private sector to become involved in maize marketing have led to great maize losses in storage both on-farm and within the cooperative storage system. The poor management record of storekeepers in the cooperative system has significant bearing on the chances of successfully implemented a long-term storage maize security stock program.

INTRODUCTION

The Food and Feed Grains Institute (FFGI) of Kansas State University was contracted by the USAID Africa Bureau in Washington, DC to conduct a study of the "Food Security Stock Policies and Procedures in Sub-Saharan Africa". The FFGI will present three reports to the Africa Bureau. The first report involves an overview of the literature on foodgrain stock management policies and procedures and an inventory of current policies and procedures. The second report, which follows, involves in-depth case studies of National Food Security Stock Policies and Procedures in Chad, Malawi, Mali, and Zambia. The third report will synthesize the findings of the earlier two reports and provide recommendations with regard to food security stock policies and procedures.

A case study was completed during a two-week field trip to the following countries: Chad, October 7-19,1991; Malawi, December 9-21, 1991; Mali, October 20 - November 2, 1991; and Zambia, November 24 - December 8, 1991. The findings for each case study for each country are presented as a separate chapter in this report. Though the format followed for describing and evaluating the security stock policies and procedures in each of the four countries is similar, the food security objectives, food security stock managing organizations, utilization practices of the security stock, food security information/early warning systems, food security stock maintenance and pest control measures, and the impacts of the security stock policy on the producers and consumers in each country are very different.

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CHAD FOOD SECURITY PROGRAM CASE STUDY

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ACRONYMS

CASAU	Comité d'Action pour la Sécurité Alimentaire et l'Aide d'Urgence (Action Committee for Food Security and Emergency Assistance)
CCE	Commission des Communautés Européennes (European Community Commission)
CEE	Communauté Economique Européenne (European Economic Community)
CSSA	Comité de Stock de Sécurité Alimentaire (Food Security Stock Committee)
DSAPS	Direction de Sécurité Alimentaire et de Populations Sinistrées (Department of Food Security and Disaster Victims)
FSSA	Fonds du Stock de Sécurité Alimentaire (Food Security Stock Fund)
MSAPS	Ministère de la Sécurité Alimentaire et de l'Aide aux Populations Sinistrées (Ministry of Food Security and Assistance to Disaster Victims)
NSCKN	Nouvelle Société commerciale de Kouilou Niari à N'Djamena (New Commercial Company of Kouilou Niari of N'Djamena)
ONC	L'Office National de Céréales (the National Cereals Office)
PAM	Programme Alimentaire Mondial (World Food Program)
SAP	Système d'Alerte Précoce (Early Warning System)
SESAPS	Sécrétariat d'Etat chargé de la Sécurité Alimentaire aux Populations Sinistrées (Secretariat of State Charged with Food Security for Disaster Victims)
SIM	Système d'Information sur les Marchés Céréaliers (Market Information System)
SSA	Stock de Sécurité Alimentaire (Food Security Stock)
UNDRO	United Nations Development Relief Organization

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SECTION I

FOOD SECURITY POLICY

The Chadian national intermediate development plan of 1986-88 outlines the major policy orientations of the nation:

- increased production aiming at food self-sufficiency of each region of the country, intensifying and diversifying animal and vegetable production to produce an exportable surplus.

- stabilizing availability of food--More emphasis on regional and village-level self-reliance--producing and storing more food. Government will promote the organization and training of the villagers. Government will improve the financial and commercial infrastructure, including roadways.

- improved access via an equitable distribution of income, reduction of regional differences in income, and an improved level of income for rural people through marketing of their surplus production. For the urban dwellers, the plan aimed at the creation of private sector jobs and improved salaries for government workers (Source FAO, 1989).

The intermediate plan of 1986-88 has been amended by a Orientation Plan (Plan d'Orientation) in December 1989, and that this Plan d'Orientation was itself amended in April 1990 (Arditi and Bouquin). In this amendment, the State is committed to withdrawing from all areas of economic endeavor that can be adequately handled by the private sector. It is now the State's intention to allow a "veritable blossoming of privatization of economic sectors." The State is in the process of liquidating, privatizing, and/or restructuring virtually all state-owned enterprises in meat, hides and skins, rice, sugar, cotton, textiles and agricultural tools and equipment. Relating to storage of domestic food products, the State will emphasize village-level storage "allowing producers to benefit from the seasonal increase in value of their products" and thereby "lightening the work of the ONC" (Arditi and Bouquin).

As established in the Plan d'Orientation, the objective of the State in relation to food security is to promote the development of private sector capability to respond effectively to food security problems. However, the State will maintain its ability (within budgetary constraints) to intervene if necessary.

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SECTION II

CONTROL OF THE NATIONAL FOOD SECURITY STOCK

Government and NGO Structures

The food security system of Chad is a cooperative effort among the Government of Chad and the international community. Emergency food aid is directed by a committee, the Action Committee for Food Security and Emergency Assistance (Comité d'Action pour la Sécurité Alimentaire et l'Aide d'Urgence, CASAU), composed of representatives of governmental ministries, foreign governments, and non-governmental aid and development organizations (NGOs). The president of the CASAU is the Secretary of State of the Ministry of Rural Development for Food Security to Disaster Stricken Peoples (Sécrétariat d'Etat chargé de la Sécurité Alimentaire aux Populations Sinistrées, SESAPS). Prior to the reorganization of government in March 1991, this secretariat was a ministry-level agency with a similar name, the Ministry for Food Security to Disaster Stricken Peoples (MSAPS). The SESAPS is headed by a secretary of state and operated by a director general. The secretariat has two divisions: the Direction de Sécurité Alimentaire et de Populations Sinistrées (DSAPS) and an administrative division. The membership of the CASAU includes 5 representatives from various government agencies and 19 representatives of international governmental and non-governmental organizations.

The CASAU was created in January 1988 by renaming and modifying an existing organization: the Emergency Food Aid Action Committee, Comité d'Action pour l'Aide Alimentaire d'Urgence. The Comité d'Action pour l'Aide Alimentaire d'Urgence had been created in February 1983 from an ad hoc committee of government officials and donors which had coalesced, during the final months of the 1965-1983 civil war, to manage the distribution of emergency food aid provided by several donors. This emergency food aid management group received some organizational and operational guidance in 1982-83 from the UNDRO.

The official act (Arrêté No. 369/MSAPS/DG/87) of the State creating the CASAU detailed its objectives, methods of operation, and membership. Article 6 of the Arrêté, which specified the objectives of the CASAU, included the following:

- organize and manage the monitoring and control of nutrition levels in at-risk areas,
- assure the mobilization and distribution of aid,
- assure the maintenance of security stocks,
- assure and coordinate the delivery of aid in the at-risk areas,
- support the stabilization and integration of national cereals markets,
- support programs to resettle disaster victims, displaced persons, and repatriated persons.

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Although the Arrêté No. 369 of December 26, 1987 provided that the CASAU assure the maintenance of security stocks, the controlling Arrêté mandating the development of a food security stock appears to be Arrêté No. 429/MSAPS/DG/89 of November 7, 1989. This Arrêté was cited in the 1990 Accord-Cadre signed by USAID (GOC, 1990).

The Arrêté, creating the CASAU, allowed for the admission to the meetings of the CASAU of all persons and all governmental ministries capable of providing information or advice relevant to the mission of the CASAU. To cope with unusual situations, the Arrêté provided for the president of the CASAU to convene an ad hoc committee of a reduced number of the members of the CASAU. In February 1989, the FAO project (FAO 1989) recommended, in a proposed agreement (Accord-Cadre), that this subcommittee be entitled the Comité du Stock de Sécurité Alimentaire (CSSA) or the Security Stock Subcommittee. The FAO proposed that the CSSA be composed of the GOC members of the CASAU and any donors contributing to the establishment and management of the national security stock. The decisions of the CSSA relating to the food security stock supersede those of the CASAU, in effect, the CSSA makes the final decisions that are authorized for execution by the CASAU.

When a decision is made by the CSSA to use emergency food reserves, a parallel agreement is made that the stock will be replaced by specified donors. This fact and the fact that the Chadian government does not pay for any of the costs associated with the reception, storage, and distribution of emergency food aid provides donors with essential control over the use of the emergency food aid. The emergency stock serves its intended function: providing sufficient supplies of emergency food aid to implement emergency distributions until additional aid can arrive.

The Size of the National Food Security Stock

The decree (Arrêté No. 429/MSAPS/DG/89 of November 7, 1989) establishing the national food security stock set its level as at least 20,000 t of local cereals: millet, sorghum, or corn (GOC 1990). No documentation can be found on the actual determination of the national food security stock. The FAO Food Security Support Project mission which developed the draft of the decree establishing the national food security stock in 1989 did not arrive at the figure recommended (20,000 t) by any analytical method but simply noted that it was the consensus of the government and potential donors. It is understood that the 20,000 t level will evolve over time as more experience is gained with the utilization of the SS. Given the institutional setting, it seems probable that the food security action committee discussed the issue before arriving at a consensus for the 20,000 t level. Various persons involved in the decision have pointed to various criteria which entered into the decision-making process. These included the storage capacity of the ONC, the level of emergency food distributions in recent years, the financial capability of the government and the donors, the delivery rate of food aid flowing into the country, and commercial imports of grain.

USAID provides the following table of information (TABLE 1) on food aid distributions between 1983/84 and 1989/90. Note that the average level of emergency food aid used during the four years for which disaggregated data are available is 9,250 t. TABLE 2 displays sources of selected cereals imports.

Imports of cereals should also figure in the determination of the level of the national food security stock. Chad is considered to have a "generally liberal" external trade regime (Yumiseva). However, the export of domestic cereals is presently prohibited as is the importation of rice. Wheat flour, on the other hand, may be imported freely. Licenses are required for importers. Authorizations are required of exporters. Wheat is imported from France and Nigeria. Coarse grains such as millet, sorghum, and corn come from neighboring Niger, Nigeria, and Cameroon. Imports arriving by sea are off-loaded in Douala, Cameroon. Shipping time from the USA to N'Djamena is estimated at three months. Shipping time from Douala to N'DJamena is 15 days. Substantial quantities of cereals are imported through official channels (it is recognized that significant imports and exports do not pass through official channels). TABLE 1 compares the reported quantities of commercially imported cereals and food aid imports with national production and assumed marketed quantities.

The 1989 FAO article estimates that current national cereal requirements are in the order of 750,000 t of which 50,000 t can normally be provided by imports. This paper also states that the average production of cereal grain in Chad lies between 450,000 and 750,000 tons per year. Assuming annual consumption of cereal is 700,000 t, the necessary quantity of rough cereal (non-decorticated) would be 800,000 t per year. This implies that Chad is structurally deficient in cereals. This estimation is strengthened by the contention of the FAO article that the per capita consumption requirements used in calculating food needs is lower than it should be. The figure used is 141 kg per capita.

Valère-Gille, 1990, suggests that the justification for a food security stock of 20,000 t needs to be addressed. He suggests that in an epoch of good harvest such a stock is too costly. A large stock can only be justified in an epoch of deficient harvest in which the security stock would be used repeatedly. Valère-Gille, 1990, also suggests that the cost of this stock level is too "high." Instead of a physical stock, the paper recommends the establishment of both a physical stock of reduced size (5,000 t) and a financial fund to be used for food security purposes and lists several advantages of a fund compared with a stock.

Valère-Gille, 1990, estimates that a 20,000 t food security stock would require a working capital fund of 1 billion FCFA, a "considerable fund." Operating costs, outside the value of the grain, would amount to 360 million FCFA. Annual sale of 1/3 of the security stock would bring in some 420 million FCFA in current values. Thus, there is clear need of continual funding of the agency charged with maintaining the security stock.

FAO (FAO, 1989) advocates minimizing the food security stock held in N'DJamena to 10,000 tons. It advocates allowing the actual size of the stock evolve over time and suggests that the "stock" be divided between a physical stock and a financial fund that could be used to purchase the needed stock. Food aid donors, including PAM and USAID, strongly disagree with the suggestion for a fund rather than a physical stock. In supporting their position, the donors cite recent experience in which an attempt was made to use counterpart funds to purchase locally produced grains for emergency distribution.

It was decided that ONC should buy the grain from an area reputed to have had a good harvest. A price was decided upon and agents sent to make the purchases. When the agents arrived they found that private merchants from other areas and

perhaps even from outside the country had bid up the local price above the price at which the agents were authorized to buy. By the time the ONC agents had obtained authorization to purchase at the higher price, the local price had again risen.

Thus, the lack of flexibility caused by the need for control prevented the ONC from making the purchases. Similar experiences in the past have convinced food aid program managers that storing money is not equivalent to storing grain when the grain is needed on an emergency basis. Note that the option of purchasing the needed supplies on the world market was apparently not mentioned in discussions of this situation.

Recent experiences involving the ordering of food aid stocks in a timely manner have also tempered food aid program managers reliance on externally positioned stocks that can be delivered "just in time." A logical methodology for determining the level of a food security stock includes the amount of time between ordering replacement supplies and their arrival. Food aid program officers in Chad stressed that delivery times are highly variable. More distressing is the fact that delivery schedules, even those agreed to by USAID officials in Washington, are often not adhered to.

In the most recent example, food aid was ordered by USAID/Chad in January 1991 to arrive in time for use in the Summer of 1991. While the recent experience in Chad indicates that a "normal" delay between ordering and delivery is on the order of 3 to 6 months, this food aid actually arrived some 9 months later in the Fall of 1991. The grain was loaded on board the ship in July and arrived in N'DJamena in early October. It appears that negotiations between USAID/Washington and CARE and PAM headquarters relating to the distribution of the cereals in Chad by CARE and PAM resulted in an unanticipated delay.

Thus, it appears that USAID/Chad cannot, at the expense of the lives of disaster victims, depend on agreed to timetables developed by its Washington based food aid delivery system. This uncertainty in an area of the delivery system in which an inexperienced person would expect control makes food aid program officers bristle at the suggestion that some person outside of Chad and without the experience of food aid operations in Chad could suggest a "formula" for them to use in recommending a level for the Chadian food security stock.

Constituting the National Food Security Stock

By 1990, the food security stock had already reached the level of 16,100 tons through ONC purchases of domestic grains (Valère-Gille). Technical and financial assistance has come from the Netherlands in the framework of the FAO Food Security Support Project (FAO, 1991). The CEE contributed $EU 4 million. Additional financial resources were provided by France. Assistance has also come from Japan and Belgium through the PAM. The ONC added 6,200 t to the food security stock during the 1988/89 crop year and 8,600 t during the 1989/90.

Funding the Operation of the National Food Security Stock

The expense of maintaining the national food security stock was addressed in the agreement (GOC 1990) between the GOC and donors governing the use and management

of the stock. Donor signatories to the protocol agree to contribute to the fund an amount decided (at the time of any use of the food security stock or when requested) by consensus of the CSSA. Contractual revenue, such as described above, will be placed in a separate account of this fund to be used to pay the expenses of the contracted services. When commodity donations are monetized, a portion of the sales revenue will also be placed in this separate account (and not used to purchase local grain but defray expenses). To cover generalized operating expenses, including the treatment of stored stocks, an annual allocation from the Fund will be provided to the ONC by the CSSA.

Currently, USAID is the only donor to agree to the protocol governing the utilization and management of the emergency food security stock (Accord-Cadre, signed August 1990). Thus, the USA is the only foreign government officially represented on the CSSA. Other donors such as the PAM, the French, and the Dutch were hesitant to commit themselves to a multi-year agreement. However, the representatives of major donors, multilateral international organizations and NGOs continue to be invited to the meetings of the CSSA and participate in the decision making process. In fact, the other donors are continuing to support the activities of the CASAU. This support of the CASAU and CSSA is a defacto support of the food security stock protocol (Accord-Cadre). This occurs as follows.

The CASAU and the ONC have very little stocks not obligated to the food security stock (less than 500 t of "commercial" stock remain from the time the ONC was heavily involved in buying and selling grain for its own account and for price stabilization purposes). Most donors are supporting a move to discourage the CASAU and the ONC from making commercial food grain transactions for the purpose of stabilizing market prices. For example, the Dutch through the FAO Food Security Support Project, and the European Economic Community and have provided financial support to the ONC for the purpose of supporting market stabilization interventions. The CEE now intends to stop all financial assistance to the ONC (USAID 1991).

A July 1990 evaluation of the ONC funded by the CCE highlighted ONC ineffectiveness with respect to its price stabilization mandate and recommended that future activities be limited to managing the security stock (Arditi and Bouquin). Similarly, the GOC indicated in its 1989 Orientation Plan that ONC had not been able to fulfill its dual mandate of stabilizing prices while maintaining a security stock, and that it should henceforth concentrate on the latter (USAID, 1991). The Dutch assistance will continue for the next three years but will be limited to two technical assistants. Thus, the resources owned or managed by the ONC and dedicated to purposes other than food security have been reduced. Current support of the CASAU and the ONC is, therefore, de facto support of the food security stock and the protocol that governs its management.

TABLE 1

Food Aid Distributions, Commercial Imports, and Domestic Production

Year	Emergency Food Aid	Program Food Aid	Total Food Aid	Commercial Imports	Domestic Production
			Metric Tons		
1989/90	3,000	13,000	16,000	24,000	696,000
1988/89	3,000	9,000	12,000	37,000	769,000
1987/88	16,000	10,000	26,000	22,000	569,000
1986/87	15,000	17,000	32,000		646,000
1985/86	[1984-86 data cannot		67,000		717,000
1984/85	be disaggregated]		127,000		346,000
1983/84			62,000		

Source: USAID, 1991

TABLE 2

Sources of Selected Commercial Cereal Imports, 1989

Source	Whole Rice	Broken Rice	Corn	Sorghum	Wheat Flour
Cameroon	51	5	10		1,988
France	1,659	10	70		13,716
USA				5,537	4,394
Thailand	3,564				
Nigeria					153
Germany					734

Source: GOC

SECTION III

UTILIZATION OF THE NATIONAL FOOD SECURITY STOCK

The Decision to Use the National Food Security Stock

Since its early days of operation, the emergency food aid management group (now called the CASAU) has met, first daily and then weekly, to decide, in a consensual manner, the allocation of food aid to disaster stricken persons. Although its name has changed, its manner of decision making, involving the analysis of available information on food emergencies and available or expected food aid supplies, has remained substantially the same. Over time its methods of collecting food emergency information have been strengthened to include the use of food emergency early warning systems such as FEWS and SAP and nutritional surveillance teams. Actually, the 1987 Arrêté No. 369 provided that the CASAU would rely on information provided by the following organizations or agencies:

- Regional Action Committees (Comités Régionaux d'Action, CRA) composed of local préfecture level) GOC representatives, non-governmental organizations, the local representative of the MSAPS and the local ONC agent. There are 14 préfectures in Chad each further subdivided into sub-regions (sous-préfectures) and then into cantons. The CRA submit food aid distribution plans to the CASAU for approval before receiving and distributing the aid. Descriptions (Procés-Verbaux) of the actual distributions are submitted to the CASAU after the distributions are made. The receipt of these descriptions is a condition precedent for receiving further aid.

- The CRAs utilize technical subcommittees (Comité Technique Regional, CTR) to:

  - assemble information on population movements, food availabilities, cereal and livestock prices, and the condition of crop.

  - submit a monthly report of this information, a copy of the report is forwarded to MSAPS.

- Sub-regional Committees (Comité Sous-Préfectoral) composed of sub-regional governmental agencies. The sub-regional committees monitor and coordinate the decisions of the CRAs and the CASAU. the sub-regional develops the description of the utilization of the food aid and sends it to the CRAs and the CASAU.

- Mobile Nutritional Surveillance Teams (Equipes Mobiles d'Information et de Surveillance Nutritionnelle, EMISN) are composed of personnel from the disaster early warning system (Système d'Alert Précoce, SAP) or personnel from the Ministry of Health and Social Affaires' Center for Food Technology and Nutrition (Centre de Nutrition et de Technologie Alimentaire, CNTA) or personnel especially designated by the CASAU.

The decision to distribute food aid is based on the information provided to the CASAU by the regional action committees. The need for the food aid is verified by the CNTA and based on objective observations of malnutrition. The threshold for food aid is a malnutrition rate of 10 percent, that is, 10 percent of the pre-school aged children in the area exhibit weight/height ratios less than 80 percent of an appropriate norm.

When the CSSA makes a decision to utilize a portion of the food security stock, it must simultaneously arrange for the replenishment of the stock through agreements with the donor members of the CASAU and the CSSA. Since the goal of the GOC is to have the food security stock composed of domestic grains, replenishment of the stock is expected to take place through purchases in the domestic market by the ONC. The funds for these purchases currently (and for the foreseeable future) come from cash grants or monetized commodity grants from donors. Thus, donated food commodities imply a marketing role for the ONC (which it has recently demonstrated to be capable of handling) or some other public or private agency not yet identified.

In some cases, the reconstitution of the security stock will be accomplished with imported sorghum or corn. This may occur when the CASAU and the CSSA decide that it would be too risky to rely on domestic production for the replenishment. For example, in the current year the security stock was practically exhausted with distributions made during the first six months of the year. The decision was made to import the grain, thereby guaranteeing that the security stock would be rebuilt to at least half of its target level without reliance on domestic production. Recent experience has shown that, under the procedures employed by the ONC, the objective of rebuilding the security stock through local purchases can be frustrated. An additional reason for using imported grain is that donors occasionally prefer to give grain rather than money.

History of Security Stock Utilization

By mid-1989, the year it was official that ONC would handle Chad's security stock, about 16,000 t of locally-produced grain was on hand for that purpose. In early fall 1990 it was obvious there would be a shortfall due to a poor harvest. The GOC appealed internationally for food aid early in 1991. Despite these predictions and appeals, ONC was granted permission to sell 2,500 t of the reserve, apparently to generate operating capital. Three thousand tons had been lost in the violent change of government in late 1990. Therefore the security stock stood at about 10,000 t when the hunger began in earnest.

This reserve was given to CARE and PAM for distribution. But it was obvious that more food would be needed quickly, so USAID/Chad arranged to buy 600 t of corn meal from Nigeria. The German and French governments, and the CEE did the same. In total, about 13,000 t of emergency food aid was distributed. TABLE 3 provides an account of the use of the security stock by reporting the level of the stock by month from October 1990 to September 1991. By October 1991 the harvest - a good one - was beginning and the crisis was nearly over. By distributing the security reserve, and with the help of emergency donations that arrived in time, widespread famine was averted. This is not to say that the poor harvest did not lead to much hunger and suffering, despite the efforts of relief workers. The

CNTA reported malnutrition in excess of 20% in one region of the country and 15% in another during the crisis, but there was no more food to give at the time.

That this could be done with only half the target amount of the reserve lends credence to the adequacy of the 20,000 t level. It appears that if 20,000 t had been available, most of the hunger could have been avoided. The experience also brings into focus the importance of having a quantity of grain pre-positioned in the country. The US sorghum called for in January 1991 to assist in the relief efforts arrived in September/October 1991. The other donors experienced similar delays in getting their emergency supplies into the country.

Because of the peculiar events of the 1990/91 crises, the burden of building and maintaining the security grain reserve in Chad, a burden that was to have been shared by all donors, now rests heavily on USAID's shoulders. First, when the 10,000 t of stock was released to CARE and PAM for distribution, USAID/Chad paid for the local transportation, since neither CARE nor PAM had funds for this. Then, since the US sorghum, ordered for distribution during the pre-harvest shortage, did not arrive until the Chadian harvest began, it could not be distributed, and will be used instead to replace the 10,000 t distributed by CARE and PAM. In addition, the 1991 Title III program provides for the purchase of 5,000 t of local grain for the reserve. Funds for maintenance and distribution of this grain are also provided. If, by that time, no emergency distributions have been made from the reserve, 15,000 t, (3/4 of the target amount) will have been provided by the US.

Recycling the National Food Security Stock

As established above, using data from TABLE 1, the average level of emergency stock use in recent years has been 9,250 t. This figure represents nearly 50% of the planned food security stock level of 20,000 t, thereby allowing a complete rotation of the stock every two years on average. This also implies the ONC would not have to make any sales of stock in order to achieve the rotation. The level of utilization in the last two years of that series was 3,000 t. At this level of usage, the ONC would have to sell old stock to achieve the desired 1/3 rotation.

TABLE 3

Security Stock Level by Month 1990/91

Month	Millet (t)	Sorghum (t)	Total (t)
Oct	9,629	5,068	14,697
Nov	9,608	4,900	14,508
Dec	7,318	4,092	11,410
Jan	6,547	3,990	10,537
Feb	6,468	3,558	10,026
Mar	5,501	2,466	7,967
Apr	4,519	1,840	6,359
May	1,980	1,126	3,106
Jun	793	680	1,473
Jul	590	379	969
Aug	274	15	289
Sep	263	4	267

Source: ONC

SECTION IV

FOOD SECURITY INFORMATION SYSTEM

The food security system in Chad collects and uses the following types of information:

- quantities of food aid on hand and quantities flowing into and out of in the system, segregated by type of food and by donor,
- available storage capacity,
- basic food prices on retail markets, and
- famine early warning system information.

Quantities of Grain in Stock

Donors require rigorous accounting of the disposition of their food aid donations. Thus, as described above, the procedures of the food aid distribution system, directed by the CASAU and the CSSA, require that food distribution programs be accomplished according to pre-approved plans and verified with follow-up reports. Non-governmental organizations making food aid distributions are generally reimbursed for their services on the basis of receipts and rigorous accounting of expenses.

During a visit to the office of the Chadian Red Cross, the KSU team observed the director of the agency handle a situation in which food aid trucks had to be rerouted. The director was very careful in detailing to his field director how the change was expected to affect fuel usage and the manner in which this would be calculated and accounted for. During that interview, the director showed the KSU team the file of a recent food aid distribution program. The file contained not only expenditure receipts and distribution agent per diem records but certifications from local government officials certifying that certain quantities of food aid had arrived and were distributed.

The ONC maintains separate accounts of food aid stocks by donor and keeps accurate records of its operations. These records can be used to determine the quantities of food aid stocks on hand and the available warehouse capacity. Verbal communication between involved donors, NGOs, and the ONC at the weekly meeting of the CASAU allow all parties to follow the disposition of food aid and plan for the flow of stocks into and out of the system. This is important in situations such as the current one in which food aid supplies which had been programmed to arrive earlier in the year are, due to delays outside of local control, arriving in a manner and at a time that will overburden the normally used storage facilities. This knowledge has stimulated the search for additional storage space by agencies, such as PAM and USAID, receiving grain.

Market Prices

Price information on basic food is collected under three programs. The Early Warning System, Système d'Alerte Précoce (SAP), (discussed in more detail below)

collects basic food price data in 197 sub-sub-regions or "cantons" in the six regions or préfectures of the Chadian sahelian zone. The data are then aggregated at the sub-regional or "sous-préfecture" level of which there are 25. The product prices collected include millet, sorghum, cattle and sheep. The data are the simple averages of prices quoted by merchants to data collection agents. No quantitative information on marketed quantities is collected although qualitative observations relating to the quantities being marketed are recorded. The data are available on a monthly basis in the form of a bulletin. The analysis of the data is described below.

The ONC collects similar price data from the major towns in the 14 regions, préfectures, of the nation. The price data are collected and reported on a weekly basis, summarized and reported on a monthly basis. The program is hampered by a lack of resources. Data collectors are not paid for the specific performance of their data collection activities. The data are maintained and summarized by a single person, working without the aid of a computer. The availability of the information is interrupted if this person is absent from the office. Analysis of the data is not part of the current program.

The Market Information System, Système d'Information des Marchés (SIM), is a newly begun market information collection and distribution system, housed with in the Ministry of Rural Development's Office of Agricultural Statistics (Bureau des Statistiques Agricoles, BSA) and supported by CILSS. The SIM collects weekly price data on nine food products in 29 markets. In addition to prices, it collects qualitative information on the quantities of the products on the market--normal, above normal, or below normal supply. The system, which is still in its start-up phase, began collecting data in April 1991.

The Early Warning System

The early warning system in Chad is quite developed and includes the SAP and FEWS programs. The SAP began operations in June 1986 and is funded by the European Development Fund, Fonds Européen de Développement (FED). Technical assistance for the SAP is provided by the European Association for Health and Development, l'Association Européen pour le Développement et la Santé (AEDES). The SAP team includes 70 persons, 51 data collectors, 5 data collection supervisors and 14 persons at the main office in N'DJamena. Both data collectors and supervisors have received training in the data collection and reporting process. The data collectors are usually members of the ONRD who take time out from their regular duties to collect the data and are paid for the delivery of the desired data.

Highly trained Europeans manage the system and hope to develop mathematical models, based on the accumulating data base, that can be used by less insensitively-trained Chadians to predict when and where food emergencies will occur. However, at present, the SAP makes no recommendations of actions to be taken in response to the information collected and emphasizes that the SAP is not a decision making system but a system of information. The information is organized into a monthly bulletin and disseminated widely among decision makers with interests or responsibilities relating to food security in Chad.

The information collected by the SAP includes quantitative data and qualitative observations relating to basic food prices (as described above), the condition

of major crops, rainfall, food availabilities, population movements, and nutritional status of the population. No quantitative predictions of the size of the harvest are currently being made; however, qualitative conclusions relating the current crop year to the previous year are given. For example, as the season progresses, the SAP report observations on the areas planted in the current year relative to the past year. The status of crop yield indicators and the nutritional status of the people are treated similarly.

Since the SAP is a continuously operating information collection system, it is constantly aware of the conditions of the people and their crops. Thus, specific food emergencies are identified as they develop. This information is used by food aid program managers in formulating their food assistance programs. Lead time for predicting the eventual size of the harvest in relation to the previous year's crop can be estimated to range from one to two months before harvest. The SAP project leader asserts that the condition of the crop is often reflected in pre-harvest grain prices, with prices in August (one or two months before the harvest is complete) rising rapidly before a poor harvest. The SAP project leader also asserts that local grain merchants have excellent intelligence relating to the potential crop and prices across a wide range of markets.

The USAID supported Famine Early Warning System (FEWS), financed by USAID, has been operational in Chad since February 1986. The FEWS representative in Chad gathers information from Chadian data collection services, including the Ministry of Rural Development's Office of Agricultural Statistics (Bureau des Statistiques Agricoles, BSA), the SAP and the ONC. FEWS also develops information relating to vegetative biomass and rainfall from data collected by satellite. FEWS compiles and publishes this information at ten day intervals in a bulletin which discusses the information and its implications for the proximate harvest and for livestock production.

According to the FEWS representative in Chad, the combined efforts of the BSA, ONC, SAP, and FEWS results in an early warning system that can predict the relative insensitivity of a food emergency in August-September, approximately one month before harvest. (The expectation of a very poor harvest is signaled by large movements of people out of the rural areas.) Food aid program officers begin, in September, alerting their food aid sources of the expected quantities needed. By November-December, the level of emergency food needs is firmly established.

Food aid should arrive in March-April so that it can be completely distributed before July when rains prevent truck movement outside of N'DJamena. This implies that the period between the establishment of the level of food aid needs and its desired delivery to N'DJamena is, at most, six months (early November through March). Food aid deliveries should require less than four months between the issuance of the order and the arrival of the grain. However, in 1991, the delay between ordering and delivery was approximately nine months for food that arrived in September-October (January-October).

SECTION V

THE OFFICE NATIONAL DES CEREALS

The agency charged with the maintenance of the national food security stock is the National Cereals Office (l'Office National des Céréales, ONC), an autonomous, commercial enterprise of the state. The role of the ONC in the national cereals market has undergone considerable evolution over the past twenty years. The objectives assigned to the ONC at its creation (GOC, 1977, Ordonnance No. 19, September 24, 1977) were:

- to develop and manage a food security reserve stock that would allow emergency interventions to be made in cases of disasters,
- to assure a better distribution of available cereals across the nation,
- to assist in the distribution of food aid without compromising ONC's self-financing status,
- to assure a better stabilization of prices at producer and consumer prices,

Note: additional objectives present in the original were not in the available copy of the ordinance.

The objectives of the ONC were modified slightly in an Arrêté signed by the prime minister on October 16, 1978. The objectives assigned to the ONC in that decree were:

- to propose the purchase and resale prices of cereals
- to guarantee the stabilization of producers and consumers prices
- to establish and manage reserve stocks of cereals permitting necessary interventions in the market in cases of necessity or emergency,
- to assure an improved distribution of cereal supplies across the national population,
- to assure, as the agent of the State, all operations bearing on cereal products.

In practice, the activities of the ONC have been limited to purchasing, storing, and selling grain for the purpose of supporting producer prices and stabilizing consumer prices (Arditi and Bouquin). Only recently has it begun to address its emergency food stock management objective. The original mandate reflects the centralist orientation of the nation and those of neighboring African nations during the post-colonial period. However, unlike many other national marketing boards in Africa, the ONC was never able to achieve the degree of control over the cereals market that marketing boards in other African countries have achieved.

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The ONC's inability to manage its buying and selling operations in a manner that produced a margin of revenue over expenses has lead to a continuous erosion of financial resources. These could not be regained by appeals to the government. A recent example of this process can be cited. According to the USAID, the ONC received an operating grant of CFA 1.2 billion from the CEE in 1986 for price stabilization purposes. By 1991, the ONC had lost two-thirds of that fund through "poor management" (USAID 1991). This "poor management" is further documented in the CCE funded study by Arditi and Bouquin. The GOC indicated in its 1989 Orientation Plan (GOC, 1989) that ONC had not been able to fulfill its dual mandate of stabilizing prices while maintaining a security stock and that it should henceforth concentrate on the latter.

With the reduction of ONC activities in price stabilization efforts, its role as storekeeper of food aid supplies, which in fact constitute the national food security reserve, has increased. In current practice, the ONC receives and holds food aid stocks until directed to monetize or to release them to NGO food aid distributors. In current practice, the ONC is paid a fee by food donors for performing these functions. These fees are presently the only viable source of funding for the ONC. In performing these functions, the ONC receives its directions either directly from a food donor in the case of a bilateral action on the part of the donor (such as monetizing US wheat flour) or from the CASAU. Thus, the CASAU has become the titular manager of emergency food aid in Chad and, hence, the manager of the national food security stock. However, because the CASAU does not receive a budget from the State, the actual decisions regarding the use of food aid can only be implemented if sanctioned by the Security Stock Subcommittee, Comité du Stock de Sécurité Alimentaire (CSSA) since the CSSA is dominated by those donors who have contributed food aid in kind or in funds.

Structure and Storage Capacity

The ONC is composed of two divisions. The Commercial Division has direct responsibility for the national food security stock, managing the grain storage warehouses, maintaining the quality of the stored grain, and rotating the stock through commercial operations. The Commercial Division is also responsible for collecting and maintaining market price information. The Administration and Finances Division is responsible for financial matters, accounting, and general administration. The ONC presently has 77 persons on its payroll. Eight administrative and management positions are filled by GOC civil servants but their salaries, like those of the other personnel must be covered through revenues generated by the ONC.

The warehouse storage available for storage of food aid and food security stocks has been variously estimated as being between 14,200 and 37,058 t. Valere-Gille estimated warehouse capacity at 37,058 t of which 19,400 is under the title of security stock and operating (stabilization) stock. Of the remaining 17,658 t, 12,500 are allocated to PAM. Actual 1990 holdings were 16,126 t as security stocks and 2,792 as operating stocks (approximately 2,500 t of stocks were sold in early 1991 to generate operating funds for ONC). Valere-Gille notes that while the GOC considers the 20,000 t figure a minimum level for the security stock, it is really a ceiling considering the available warehouse capacity and its allocation between the GOC food security program and the PAM. The 1990 CCE

study estimated ONC warehouse capacity to be 14,200 t (Arditi and Bouquin). The director of the commercial division reported their stocking capacity to be 21,100 t. It is still questionable whether all of the ONC capacity could be used for the security stock, since ONC has allocated some of its storage to programmed food aid (food aid programs of PAM that are not considered emergency programs). The placement and tonnage capacities of the warehouses and the origin of the figures are given in TABLE 4.

Staff Training

Of the 77 employees of ONC, 16 are chief agents, responsible for the functioning of the outlying ONC depots, 17 are warehousemen, responsible for handling, storage, and pest control, and 6 belong to the mobile pest control unit. This unit has a chief and 5 technicians. The current head of this unit was trained in Mali, Burkina Faso, and the Cameroon, courtesy of FAO and GTZ. He, in turn, has trained his technicians in pest control techniques. Both the current chief and his supervisor have been with the ONC since 1983.

Pest Control and its Effectiveness

Since the KSU team arrived when old grain stocks were depleted, it was not possible to use the quality of old stocks as the indicator of the efficiency of quality maintenance. Therefore, the evaluation had to be made through interviews and the inspection of documents, warehouses, and equipment, a more subjective method.

Pest control begins with cleanliness enforced by frequent inspections, and the ONC recognizes this in their instructions to warehouse managers. In theory, their warehouse inspection form requires that managers record the sanitary conditions of the warehouse. In response to this information, sent bi-monthly from each warehouse, a treatment team is supposed to be dispatched to apply pesticide. Stocks of Actellic and pyrethroid insecticides, and backpack sprayers were indeed on hand in N'DJamena. These chemicals and equipment are used to treat empty warehouses and stack surfaces.

According to ONC personnel, 12 extra workers are hired to build a well of bags in the top center of the stack and to position the huge tarpaulins during fumigations. In order to provide a more even distribution of the fumigant gas, phosphine tablets are placed in open wooden boxes which are positioned at the base of the stack and in the well. The tarp is sealed to the floor with sand snakes made from old sacks. The exposition period is 7 days. The same stack may be fumigated three times a year. The fact that ONC personnel could supply these details indicated adequate training and competence. Apparently, rodents are not an important threat, as there seemed to be no special effort to control them.

Based on the interviews, it was obvious that ONC's key people are adequately trained, and that the administrative mechanisms are in place to maintain the inventory and grain quality in an adequate manner. The quality maintenance staff has developed standard forms which warehouse managers are to complete bi-monthly and send to the head of the pest control unit. They provide information relative to the sanitary condition of the grain and the warehouse. Other forms document each chemical treatment, while details of re-bagged stock are also recorded on

standard forms. Fresh pesticide formulations are on hand, and records show that they are being used.

Sixteen tarpaulins, left from a former FAO project, are used for fumigation. Sand snakes, long thin bags filled with sand for sealing the tarpaulin to the floor during a fumigation, have been constructed by ONC staff from old poly bags, and are used in the fumigations. The fact that the ONC staff recognized the importance of these devices, and fabricated them using only the resources at hand indicates that the staff is well trained and motivated. The ONC warehouses in N'DJamena are new and in good condition. Stacks of grain are solidly constructed over wooden pallets. These observations all speak well of ONC's technical capabilities as the repository of the security reserve stock.

On paper, this organization looks pretty good, but the cover reads better than the text. The ONC warehouses at N'DJamena reek of insect infestation, insects fly and crawl everywhere, and floors are dirty. The fumigation tarps are more than 5 years old, and it is unlikely they provide an adequate seal. ONC does not have fumigation safety equipment such as gas masks, gas concentration meters, and warning placards. ONC personnel complain that the infestation brought into the warehouse with new stock, combined with the insects that constantly arrive from neighboring stores (PAM operates the other warehouses in the complex) make it impossible to maintain recently-fumigated grain free of infestation.

Perhaps the KSU team arrived at a moment that makes the ONC look less capable than it really is. The ONC warehouses we visited were receiving infested U. S. sorghum and were still holding some of the infested Nigerian corn meal purchased for the emergency relief effort the previous year. There was also dirty, infested Thai sorghum, donated by the EEC, in one of the warehouses visited. The dirt (and probably the infestation as well) arrived with the product; it was not produced in storage. The ONC pest control unit planned to fumigate all the product in the warehouses we visited as soon as unloading was complete. The lack of cleanliness may have been due to having arrived during the receipt of a major shipment. Still, it will be difficult to maintain the quality of the soft U. S. sorghum if it has to be stored in proximity to infested commodities. God help them if they are forced to hold it three years.

Cost of Quality Maintenance

The cost of operating the security reserve for a year is estimated by ONC at 6,300 CFA/ton, not including amortization of the buildings (which were donated). TABLE 5 provides a breakdown of this cost. This is equivalent to about $22.50/ton/yr (280 CFA = 1 USD). By comparison, average storage costs paid by the US Commodity Credit Corporation to store grain in the US are in the range of 15 to 16 USD/t/year. In addition, about 4 USD/t is charged at U. S. elevators if grain has to be moved in or out (National Grain and Feed Association, Grain Book, 1988, National Grain and Feed Association, Washington, D.C.). The cost of individual chemicals is at least twice that of the US. The last shipment of Actellic cost FAO the equivalent of 21.30 USD/l and phosphine cost 12.6 cents USD per tablet.

TABLE 4

Public Warehouse Capacity by Agency According to Various Sources

	Sources of Information							
	(1)	(2)	(3)			(4)		
	Capacity in Metric Tons by Agency							
Location	ONC	ONC	ONC	PAM	MSAPS	(5)	(6)	(7)
N'Djamena	8600	2600	4600	4500	10300	9550		
Abéché	2500	1000	1000	3500		3772		5000
Moundou	600	600	600	1850		3200		2500
Mao	600	600	600	2500				2500
Mongo	600	600	600	2000				2500
Gore							1784	
Moissala							2148	
Kocabri							2304	
Guidari							1800	
Bol	600	600	600					
Noukou	600	600	600					
Moussoro	600	600	600					
Ati	600	600	600					
Oum-Hadjer	600	600	600					
Koro-Toro		600						
Biltine	600	600	600					
Iriba			400					
Guéréda			400					
Adré			500					
Bitkine	600	600	600					
Am Dam			500					
Goz Beida			500					
Am-Timan	1000	600	1000					
Sahr	600	600	600					
Dourbali	600	600	600					
Pala	300	300						
Doba	1000	1000	1000					
Kelo	500	500	500					
Faya			1000					
			18600	14350	10300	16522	8036	12500
TOTALS	21100	13800		43250			37058	

Sources:

(1) ONC, Commercial Division, Director
(2) Arditi and Bouquin
(3) USAID personal communication
(4) Valère-Gille

Notes:

(5) Warehouses controlled by a mixture of agencies, including NSCKN, ONC, SONACOT, & MSAPS
(6) Warehouses controlled by COTONTCHAD
(7) Warehouses controlled by PAM

TABLE 5

Estimated Annual Cost of Maintaining One Ton of Security Stock 1990/91

Item	Francs CFA
Maintenance and Repairs	400
Resacking (one sack per ton)	450
Pest Control Materials	625
Pest Control Costs (salaries, per diem, etc.)	550
Security (Guards, etc.)	300
Warehousemen and Temporary Labor	600
Administrative Costs	
Personnel	1,200
Water, electricity	525
PTT	150
Office supplies	500
Monitoring and Control Activities	655
Miscellaneous	325
Total	6,300 CFA

(1) Based on 20,000 t stock
Source: FAO/ONC
1 USD = 280 CFA

CHAD

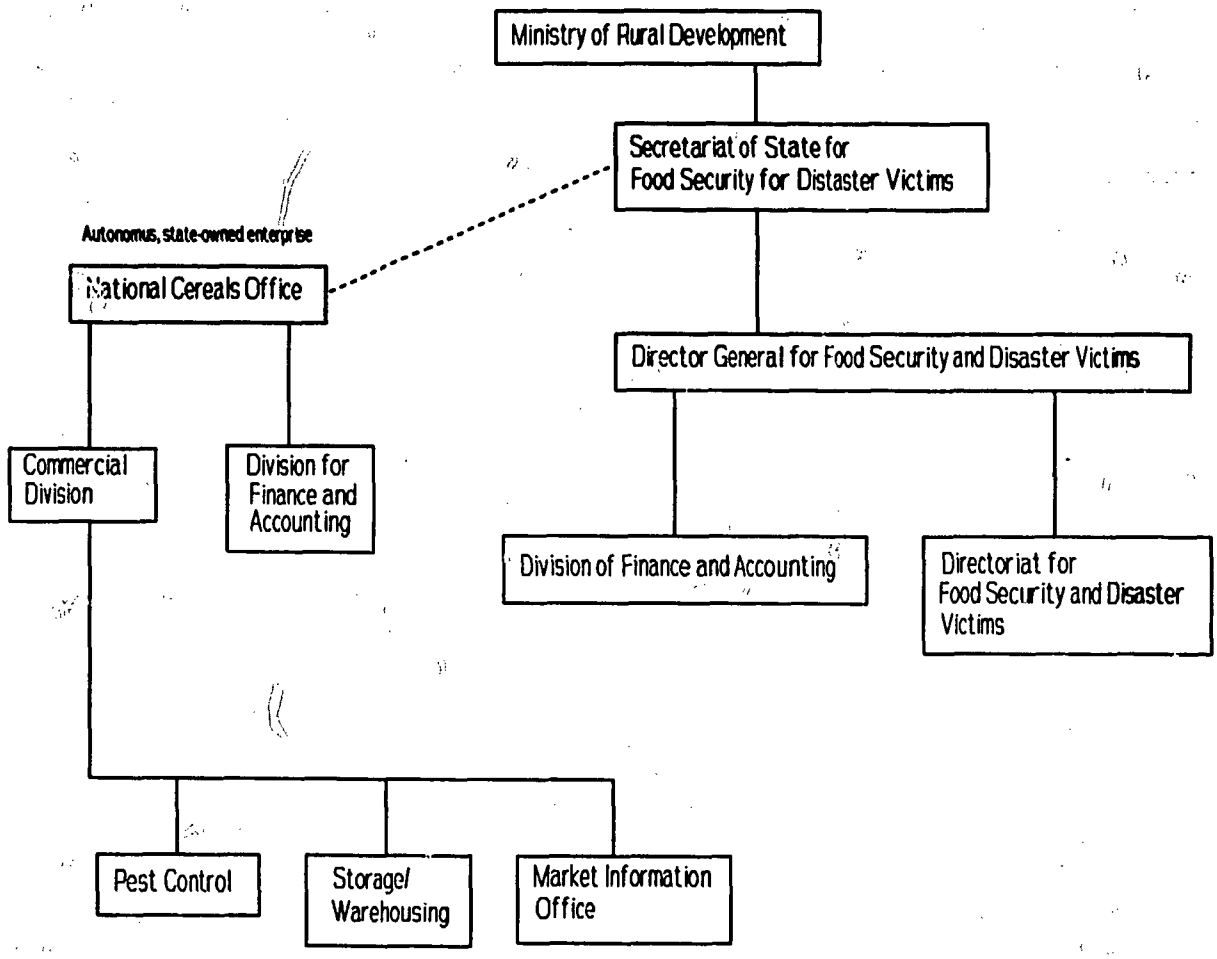

FIGURE 1. Organogram of the ONC

SECTION VI

DONORS SUPPORTING THE FOOD SECURITY PROGRAM

Although the ONC does not receive budgetary support from the State, it does receive technical and financial assistance from various donors. It receives technical assistance from the FAO through funding by the Netherlands (Project GCPS/CHD/018/NET) since 1983 in the realms of administration and marketing. This assistance is due to be reduced to the provision of two technicians. USAID supports the ONC by reimbursing it for expenses incurred in accepting and storing USAID food aid. The ONC also receives support from other donors: CEE, USA, France, Japan, and Belgium in the form of monetary assistance or food commodities.

In addition to the programmed aid flowing to the ONC from the Netherlands, the CEE, the French, Japan, and Belgium described above, the ONC receives reimbursement for grain storage and marketing services it provides to donors. Recently, when USAID had the ONC monetize 5,000 t of wheat flour, USAID agreed to reimburse ONC for its expenses relating to that sale. USAID has agreed to pay ONC a handling fee equal to 8% of the sales proceeds from the programmed sale of 10,000 additional tons of wheat flour. The protocol (Accord-Cadre) governing the management of the security stock provides for a Food Security Stock Fund, Fonds du Stock de Sécurité Alimentaire (FSSA) that will be used to pay for the operating expenses of the ONC.

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SECTION VII

IMPACTS OF STOCK MANAGEMENT POLICIES

Impact on Prices

Given the lack of studies attempting to estimate annual supply and demand functions for the nation, the impacts on producer and consumer prices of these operations remain an empirical question. The purchases, sales, and carry-over stocks of the ONC for recent years are shown in TABLE 6. The estimated national production is also presented in the table. Given the typical assumption that 15 to 20 percent of this production leaves the farm (is "marketed"), it might be expected that the operations of the ONC would have had some noticeable impact on prices.

For example, in 1987/88 the net effect of ONC operations was the addition of 6,705 t of cereals onto the annual market. This 6,705 t would represent about 6 percent of the "marketed" production for that year (569,000 x .2 = 113,800 t). Assuming demand elasticity of -.2, one would expect consumer level prices to fall by 30 percent due to the 6 percent additional supply. An explanation for this lack of price response could include such uncertainties as a shift in the assumption that 20 percent of production moves off the farm, unexpected flexibility or instability in the demand and supply functions, and inability to discern and explain price changes in the available price data. Additionally, it appears (personal communication, Felix Lee, FEWS technical advisor) that the Chadian cereal "market" is composed of several, poorly integrated regional markets.

To test the impact of ONC interventions on a given regional market would require that the ONC intervention data be segregated to identify when and where it was applied. The necessary data for conducting a quantitative analysis of the impacts of the food security stocking program does not exist. All that can be given is a qualitative and descriptive analysis. The primary impact of the stocking policy is that it allows emergency food aid to be distributed in a timely manner. This impact is immeasurably positive in terms of lives saved and morbidity prevented.

Generalized Impacts

The secondary impact lies in the impact on otherwise healthy producers and consumers who are able either to sell to the ONC at a price above the market or buy from it at a price below the market. As mentioned above, the early years of operation of the ONC were marked by very poor management, resulting in significant losses in its commercial operations. In the early years, the ONC often purchased its stocks from merchants at double the price existing in the market at the level of the producer (Arditi and Bouquin). Clearly, this did not significantly impact the producers, but must have had some beneficial impact on the merchants who are also consumers.

These operations resulted in resale prices (if the ONC was to produce a positive margin) that were uninteresting to general consumers. In order to sell their

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grain, the ONC offered it to government functionaries on credit. Of course, this reduced the real price to this group of consumers and enhanced their welfare. Later it turned out that many of the consumers could not pay their credit accounts. Naturally, this increased the welfare of those who did not have to pay.

The magnitude of these welfare transfers can be appreciated by the following. According to the USAID, the ONC received an operating grant of CFA 1.2 billion from the CEE in 1986 for price stabilization purposes. By 1991, the ONC had lost two-thirds of that fund through "poor management" (USAID 1991). Thus, consumers and some producers shared approximately $4.8 million dollars over the six year period.

The FAO asserts that, through its efforts in the framework of the Food Security Support Project, the commercial operations of the ONC improved significantly over the project period, 1987-90 (FAO, 1991). It can be expected that the ability of the ONC to effectuate profitable price stabilization activities in the future as it rotates necessary quantities of the SS. However, the impact of these operations will be limited by the quantities rotated. Less than 7,000 t per year if the national food security stock level remains near 20,000 t.

Impact on Producers

Assuming that 7,000 t were rotated at a price 20% above a market price of 50 CFA/kg, increased income to producers would be in the magnitude of 70,00,000 CFA or $280,000. Assuming producers sell about 6 sacks or 300 kg each, each producers' share of this producers surplus would be equal to .3/7,000(280,000) = $12. Thus, about 14,000 producers or about .3% of the population would experience and increase in income which represents 7.5% of the average per capita GNP of $160.

Impact on Consumers

Assuming that 7,000 t were resold to consumers at a price 20% below a market price of 80 CFA/kg, increased savings to consumers would be in the magnitude of 112,000,000 CFA or $448,000. Assuming individual consumers purchased 75 kg at this reduced price, each of them would realize a savings equal to .075/7000(448,000) = $4.80. Thus, about 93,000 consumers or 2% of the population would experience an increase in savings which represents 3% of the average per capita GNP of $160.

Using these assumptions producers and consumers would share a total of $728,000. As mentioned above, the cost of maintaining a food security reserve of 20,000 t ranges between $500,000 and 1.500,000. At a cost of $500,000 per year, it might be a social good.

As a final comment, remember these figures are based on assumptions. More understanding can be obtained by changing some of the assumptions and observing the change in estimated effects. Such sensitivity analysis can provide pragmatic indications of the magnitude of the effects.

TABLE 6

ONC Purchases, Sales, Stocks, Net Intervention, Net Intervention as a Percent of Marketed Production and Gross Domestic Cereal Production

Year	Purchases	Sales	Stocks	Net Intervention		Gross Production
	t	t	t	t	%	t
1984/85	1,267	795	472			346,000
1985/86	7,536	431	7,577	(7,105)	5	717,000
1986/87	8,282	4,571	11,288	(3,711)	3	646,000
1987/88	6,785	13,490	4,583	6,705	6	569,000
1988/89	12,019	7,959	8,643	4,060	3	769,000
1989/90	8,672					696,000

Source: USAID, 1991

SECTION VIII

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APPENDIX 1

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MALAWI FOOD SECURITY PROGRAM CASE STUDY

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ACRONYMS

ADD	Agricultural Development Division
ADMARC	Agricultural Development and Marketing Corporation
DANIDA	Danish International Development Agency
EEC	European Economic Community
EP&D	Economic Panning and Development
EWS	Early Warning System
EWTC	Early Warning Technical Committee
FAO	Food and Agricultural Organization of the United Nations
FARRU	Food and Assistance for Relief and Rehabilitation Unit
FSNU	Food Security and Nutrition Unit
GRM	Government of the Republic of Malawi
MOA	Ministry of Agriculture
MOU	Memorandum of Understanding
NCEC	National Crop Estimates Committee
NEWS	National Early Warning System
NEWU	National Early Warning Unit
NGO	Not-for-Profit Non-Government Organization
NSO	National Statistics Office
OPC	Office of the President and Cabinet
SADCC	Southern African Development Coordination Conference
SGR	Strategic Grain Reserve
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WFP	World Food Program

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SECTION I

FOOD SECURITY POLICY

In light of the importance of food security in Malawi's development and the overall goal of improved welfare of the population, the Government of the Republic of Malawi (GRM) places high priority on establishing an explicit policy statement which outlines a coherent strategy to improve food security at both national and household levels with the ultimate goal to raise nutritional levels of the population, particularly the more vulnerable members of society. Food security at the national level is achieved when all households in the country are food secure and, hence, have the access and ability to satisfy their nutritional requirements to maintain a healthy and active life throughout the year. The occurrence of natural disasters, such as drought, floods, and crop destruction by pests, in recent years has heightened the GRM's commitment to ensure that the country has access to adequate supplies of food at all times to meet commercial needs, as well as local food crises. The GRM places high priority on maintaining a Strategic Grain Reserve (SGR) to stabilize national supplies and to ensure relatively stable prices of maize both to the consumer and producer through the accumulation or release of stocks during periods of domestic surplus or shortfall, as well as to provide a source of emergency food relief (Mughogho, 1989; OPC/GRM, 1990). The added role of the SGR is to provide some measure of protection against fluctuations in output to reduce the economic losses incurred through unprofitable grain exports (Mughogho, 1989).

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SECTION II

CONTROL OF THE NATIONAL FOOD SECURITY STOCK

Managing Organizations

Although the Government of the Republic of Malawi (GRM) is ultimately responsible for directing the distribution of the SGR to deficit areas, the responsibility of maintaining the SGR rests with the Agricultural Development and Marketing Corporation (ADMARC).

Food Security and Nutrition Unit. In 1987, a Food Security and Nutrition Unit (FSNU) was established, with the assistance of the World Bank, in the Department of Economic Planning and Development (EP&D) under the Office of the President and Cabinet (OPC) to provide the leadership, guidance and analysis needed to improve Malawi's food security and nutritional status at both the national and household levels (OPC/GRM, 1991). Since its establishment, the FSNU has developed a comprehensive strategy for identifying and addressing Malawi's food security and nutritional needs including the timely analysis of maize production and market data, the integration of early warning surveillance systems into the food security program, the management of the SGR, and intervention into the market with food aid to address hunger and malnutrition problems. The FSNU also has played a significant role in the price stabilization program conducted by ADMARC, by collecting market supply and demand information and analyzing the price trends of maize and the general impacts of supply/demand on maize prices.

The focus of the early analytical work by the FSNU was on food security at the national level. In November, 1987, the FSNU played a key role in mobilizing aid in time to forestall the worst of what could have been an enormous food emergency. In 1990, one of the FSNU's key activities was in facilitating the development of the Food Security and Nutrition Policy Statement. The FSNU has also prepared a project, currently being implemented, to rebuild the SGR and has developed guidelines for the management of the SGR. The FSNU continues to carry out its work in food gap analysis, monthly supply/demand maize modeling, and food security and nutrition database management. This analytical work plays a major role in determining the adequacy of ADMARC and the SGR stocks. Though a great deal has been accomplished by the FSNU, staff shortages in the FSNU have prevented the full scope of work from being completed.

The FSNU also chairs the Early Warning Technical Committee (EWTC) which utilizes the early warning data and publishes a Quarterly Early Warning Report which summarizes the key agricultural, meteorological, and food stock data, and recommends necessary actions if a food shortage is forecasted. The output from the EWTC is used for planning food aid imports, which falls under the responsibility of the FSNU and the Food and Assistance for Relief and Rehabilitation Unit (FARRU) which operates in close collaboration with the FSNU. The institutional organization and the major outputs of the National Food and Nutritional Surveillance is provided in Figure 1. Figure 2 provides a schematic of the major information flows which comprise the food and nutrition surveillance system (OPC/GRM, 1991).

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Since 1987, when FSNU was established, until 1991, the FSNU has received technical assistance in carrying out its scope of work from both Cornell University in its joint program with UNICEF and from the Harvard Institution for International Development.

ADMARC. ADMARC is the major purchaser of maize from producers in Malawi. The GRM has been purchasing its maize stocks for the SGR from ADMARC. All imported maize that is to be placed into the SGR by the GRM is handled by ADMARC. The maintenance and handling of the GRM owned maize stocks in the SGR is done by ADMARC. The GRM pays ADMARC a fee for maintaining the silos and the SGR (Scarborough, 1991).

As is the case with maintaining the SGR, many of ADMARC's responsibilities are social (non-commercial) functions done on behalf of the GRM. Another social function of ADMARC's having to do with food security is the operation of a maize price stabilization program, for which ADMARC is not reimbursed by the GRM. ADMARC's chief responsibility in price stabilization is to be "buyer of last resort" at the producer floor price (Lele, 1988). The producer floor price (and the depot delivered price) is dictated by the National Crop Pricing Advisory Committee (which generally follows the recommendations of the Pricing Unit in the MOA) to ADMARC (Section 7, Table 6).

The GRM sets the maximum retail price for maize sold by agents that buy from ADMARC. ADMARC plays a role in defending the ceiling price of maize by maintaining adequate stocks of maize in the market. When ADMARC maize stocks are projected to be exhausted, ADMARC is able to borrow maize from the SGR.

ADMARC's primary commercial activity in maize is the purchasing and selling of most of the marketable surplus in Malawi. However, in rural areas where private sector maize marketing is not financially viable, ADMARC has assumed the social function of buying and selling maize.

The Size of the National Food Security Stock

The SGR was set in 1981 at a target level of 180,000 metric tons (mt), representing approximately three months of total maize consumption (Seidler, personal communication, 1991). With a current annual (total) consumption of about 1.5 million metric tons, the 180,000 mt represents less than 1.5 months of total consumption of maize. Taking into consideration a number of different factors including

(1) the increase in the population at approximately 3.3% over the last decade and a similar high growth rate expected in the next few years,

(2) the early accuracy of the maize crop projections and the maize market demand,

(3) the lead time required to import maize,

(4) the high cost of importing maize (USD250/mt from Zimbabwe (1991)),

(5) the maize market liberalizing policies in place, and

(6) ever increasing costs of maintaining a SGR.

it is reasonable to see why re-evaluations of the target level of the SGR have been made.

If one looks at the historical adequacy of the SGR during times of food emergencies, there are two periods that required an exhaustive use of the SGR stocks. One period was in the 1986/87, 1987/88, and 1988/89 marketing years when a series of events took place that depleted the SGR stocks and required the GRM to go to the donors for food aid assistance. The stocks that were needed to supply the commercial market, the Malawian urban and rural poor most vulnerable to the food shortage, and the refugees were initially made available using the SGR, then through the coordination of the various GRM agencies, ADMARC, and the donors. Because of delays in shipping, food aid did not reach Malawi for replenishing the SGR until the 1989/90 marketing year. For two years, 1987/88 and 1988/89, the SGR had no maize. ADMARC purchases, normally well above 200,000 mt/year averaged only 96,400 mt during the years 1986/87 - 1988/89. Details regarding the adequacy of stocks to maintain food security during this period were not readily available.

In 1990/91, agencies within the GRM, ADMARC, and the donors were better prepared to respond to the food emergency. The NEWU and the FSTC paid early attention to the ensuing food shortage that year by requesting use of 158,000 mt of maize from the SGR. In spite of the efforts of the NEWU and the FSTC, the drought relief efforts were late in coming, leaving the SGR level at the end of the year at a low for the year at 109,000 mt. It is important to realize that if the total 158,000 mt requested by the GRM had been withdrawn from the SGR on a timely basis, very few stocks would have been left in the SGR by the end of the year. In this case, the SGR (at the beginning of 1990/91 near the targeted 180,000 mt) was sufficient to address a major food emergency during 1990/91. Donor food aid assistance for replenishing the SGR has also been sufficient to the extent that the stock level in the SGR for the end of the year in 1991/92 has been forecasted at 192,000 mt. It is noteworthy that the GRM requires donor food aid assistance in order to replenish its SGR. The GRM cannot afford to import commercial maize stocks for the SGR, especially when the cost of trucking a metric ton of maize from Zimbabwe was USD80 in the most recent shipment. The results of the 1990/91 food emergency have led some GRM officials to believe that the 180,000 mt may indeed be the minimum target level of maize stocks for the SGR.

In these two actual cases of drastic food emergencies, the SGR stocks coupled with responses from the donor community for provision of food aid were apparently sufficient to prevent any human disaster from occurring. The 1990/91 emergency was handled more efficiently in terms of the responsible technical people alerting the food security authorities at an early date and also in terms of the donors having responded to the needs of the country in expediting the replenishment of the SGR.

Drawing on the experiences of these two cases, one could project, assuming that the early warning system is likely to remain as efficient as exemplified, that the FSTC will continue to meet when necessary to form a recommendation on future needs of the SGR, and that the donor community will respond to requests made by the GRM when food emergencies develop, that the present target level (or possibly

some level below the current target) of the SGR is highly likely to be sufficient for ensuring national food security within Malawi in the near future.

In a study that evaluated the current targeted level for the SGR stocks, Pinckney (1990) concluded that "the key to formulating efficient price, storage, and trade policies for maize in Malawi is to take advantage of 'exports' to WFP and other profitable regional outlets prior to holding any interannual supply stabilization stocks." The author contends that over a ten-year historical period, average maize purchases by ADMARC exceeded maize sales by ADMARC from June through and including October. For those five months, the targeted level of 180,000 mt of maize in the SGR was not needed, a portion of which could have been exported. In this study, the author considered 60,000 mt of maize as Malawi's regional export potential. Pinckney concluded the adoption of such a policy could save the GRM an estimated US$4,000,000. Using current maize producer prices paid by ADMARC, the updated savings using Pinckney's methodology would be approximately US$3,000,000.

It is the coordination among the GRM agencies responsible for food security, ADMARC, and the donors that, if enhanced, could result in a lowering of the targeted SGR by a significant percentage. The tangible requirements from the GRM and/or the donors would include, besides the maintenance of the SGR, the probable maintenance of a financial stock available upon demand for importing maize when emergencies warrant them.

Constituting the National Food Security Stock

In the early 1980's, Malawi built up a reserve of 180,000 metric tons of white maize as a result of very high production of maize in Malawi. The high production was a direct result of producers being offered by ADMARC relatively high producer prices.

In 1986, however, a major food emergency enveloped Malawi as refugees streamed across the border from Mozambique, the mealy bug destroyed a significant portion of the cassava crop, and drought struck the country. Due to massive food needs, the entire SGR was exhausted and food aid was requested from the donors. Replenishment of the SGR was not made until 1989/90, when USAID and the EEC provided mostly white maize from Zimbabwe for replenishing the SGR. By April 1990, the SGR had been re-constituted up to the level of 171,470 mt.

Since April 1990, drought and floods required the release of SGR stocks to the extent that by the end of 1990/91, 109,000 mt remained in the SGR. The SGR is in the process of being re-constituted to its target level during 1991/92. The 77,000 mt of maize borrowed the previous year from the reserve by ADMARC for its commercial maize marketing activities has been replaced in the SGR plus donors (USA, WFP) are continuing to add to the SGR.

Funding the Operation of the National Food Security Stock

The GRM has operated a maize price stabilization program through ADMARC. It is through ADMARC, then, that the GRM has used a combination of fixed buying and selling prices, stock accumulation, and external trade to stabilize maize prices.

This program has become very expensive to ADMARC in the course of its normal, otherwise commercial, operations.

In the mid-1970's, the selling price of maize was set at a level that did not cover costs incurred by ADMARC in purchasing, marketing, transporting, storing and milling, with the result that the combined producer price and transport cost was greater than the consumer price. This relationship was somewhat reversed when the consumer price was raised by 32% in 1975. However, the situation lasted for three years because of sharp increases in transport costs. A further increase of 37% in the consumer price would have been required in 1980 to contain the maize subsidy. The high cost of the maize subsidy was offset by high profits accruing to ADMARC's tobacco account. After tobacco prices fell in the mid 1980's, ADMARC's finances deteriorated very sharply into substantial losses (Lele, 1988).

In 1983, the GRM followed the recommendations of a consultancy to overhaul the financial and management structure of ADMARC. The consultants advised that the GRM should compensate ADMARC for carrying out non-commercial functions such as relief related distribution, price stabilization activities, the operation of markets for developmental purposes, the consumer subsidy on maize, storage of the SGR and construction of silos for the SGR. Aside from the purchasing of the grain reserve, agreement was not reached on the financing and detailed means of implementation of ADMARC's non-commercial functions (Takavarasha, 1990).

On September 15, 1985, an agreement was reached between the GRM and ADMARC regarding the funding of ADMARC's non-commercial activities. However, ADMARC claims the GRM has not reimbursed ADMARC according to the agreement.

Since the signing of the agreement, the GRM has followed a cost cutting program, including, in 1986, the agreement to close 224 out of 1419 ADMARC markets and to operate 148 markets on a reduced scale. By 1987, ADMARC had reduced staffing levels by several thousand permanent employees and had closed 125 of 1419 (15%) of its rural markets, especially those where buying areas overlapped and annual throughput was less than 60 metric tons. ADMARC, a tightly run organization, also instituted a number of managerial changes designed to increase individual accountability and performance (Christiansen and Southworth, 1988).

However, because some vulnerable groups in areas without markets were adversely affected by the market closings, the GRM, in 1990, ordered ADMARC to re-open 88 of the markets (Kapusa, personal communication, 1991). This came at a great expense to ADMARC, much of which has not been reimbursed. At present, ADMARC is operating over 1000 rural depots.

The GRM has acknowledged the fact that ADMARC cannot subsidize its maize operations with profits from its tobacco operations (especially since its tobacco profits plummeted when the demand quantities for tobacco for West African countries fell). At this time, then, the GRM has been reimbursing ADMARC for non-commercial activities, such as, over 1.062 million Kwacha for the maintenance of the SGR (an average of 161,154 mt) in 1990/91 (Appendix 2). However, there have been instances where the GRM has not provided sufficient funding for ADMARC to carry out its non-commercial activities (including price stabilization activities, maintaining the SGR, and maintaining the silos) as efficiently as necessary. For example, there were reports in 1991 that ADMARC did not buy all

the maize stocks offered for sale to them by producers because they did not have money from the GRM to pay these producers.

With ADMARC's financial condition becoming a major concern, the issue of how ADMARC is compensated by the GRM for carrying out non-commercial activities has received a great deal of attention. A Memorandum of Understanding (MOU) is currently being drawn up through technical assistance from the World Bank. The MOU will seek to ensure that ADMARC's financial viability is maintained through the adequate funding of the social (non-commercial) functions it performs on behalf of the GRM. At the same time, the MOU will serve to assure the GRM that ADMARC is performing its social functions effectively and that its overall operations are efficiently managed. The Ministry of Finance will assure full funding of ADMARC's social activities on the basis of a methodology agreed by the parties. This will facilitate the continued financial integrity of ADMARC thereby ensuring ADMARC's ability to continue effective performance of these functions over the long-term.

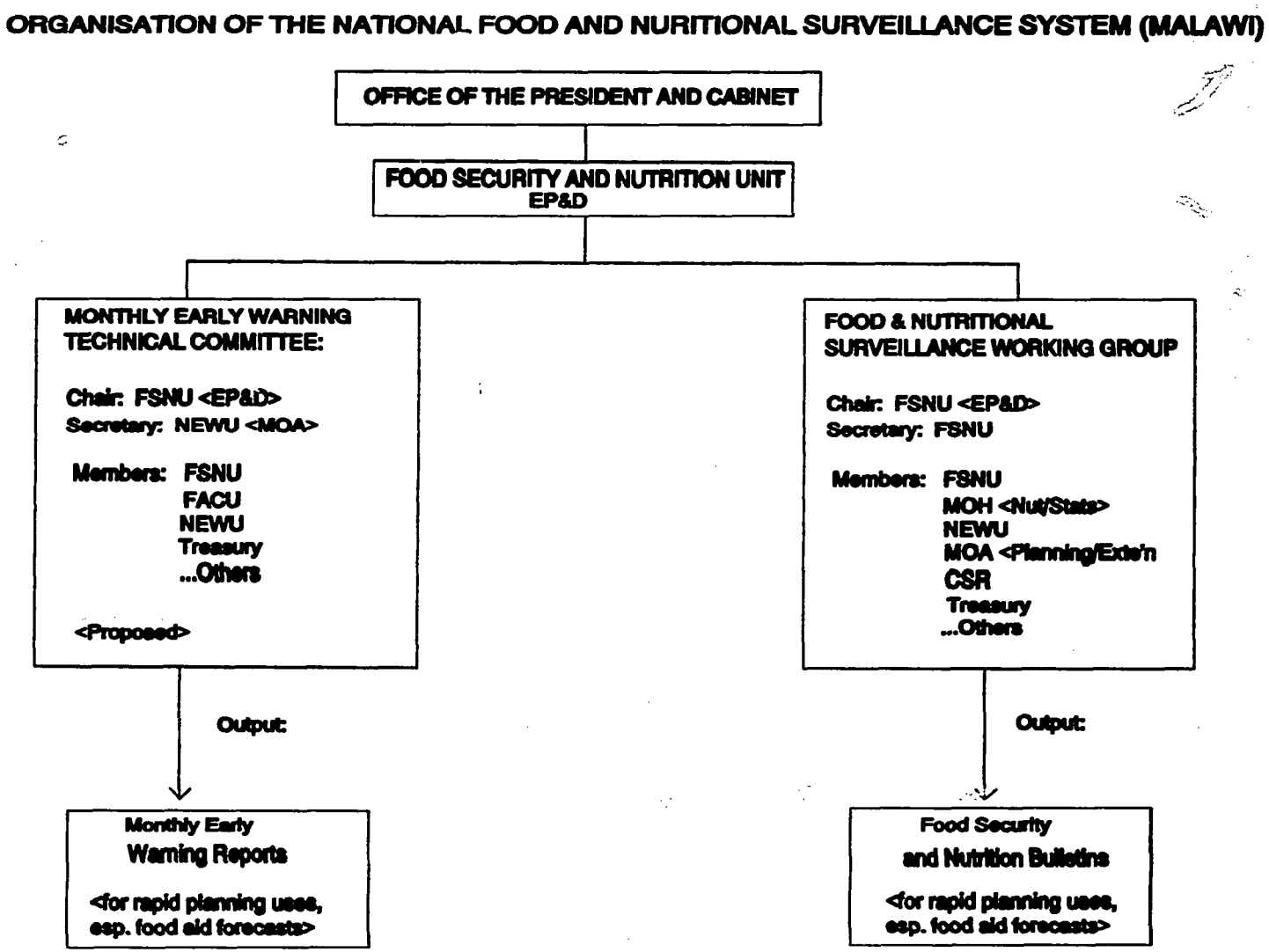

Figure 1. Organization of the National Food and Nutritional Surveillance System

NATIONAL FOOD AND NUTRITIONAL SURVEILLANCE SYSTEM (MALAWI)
DATA SOURCES AND FLOWS

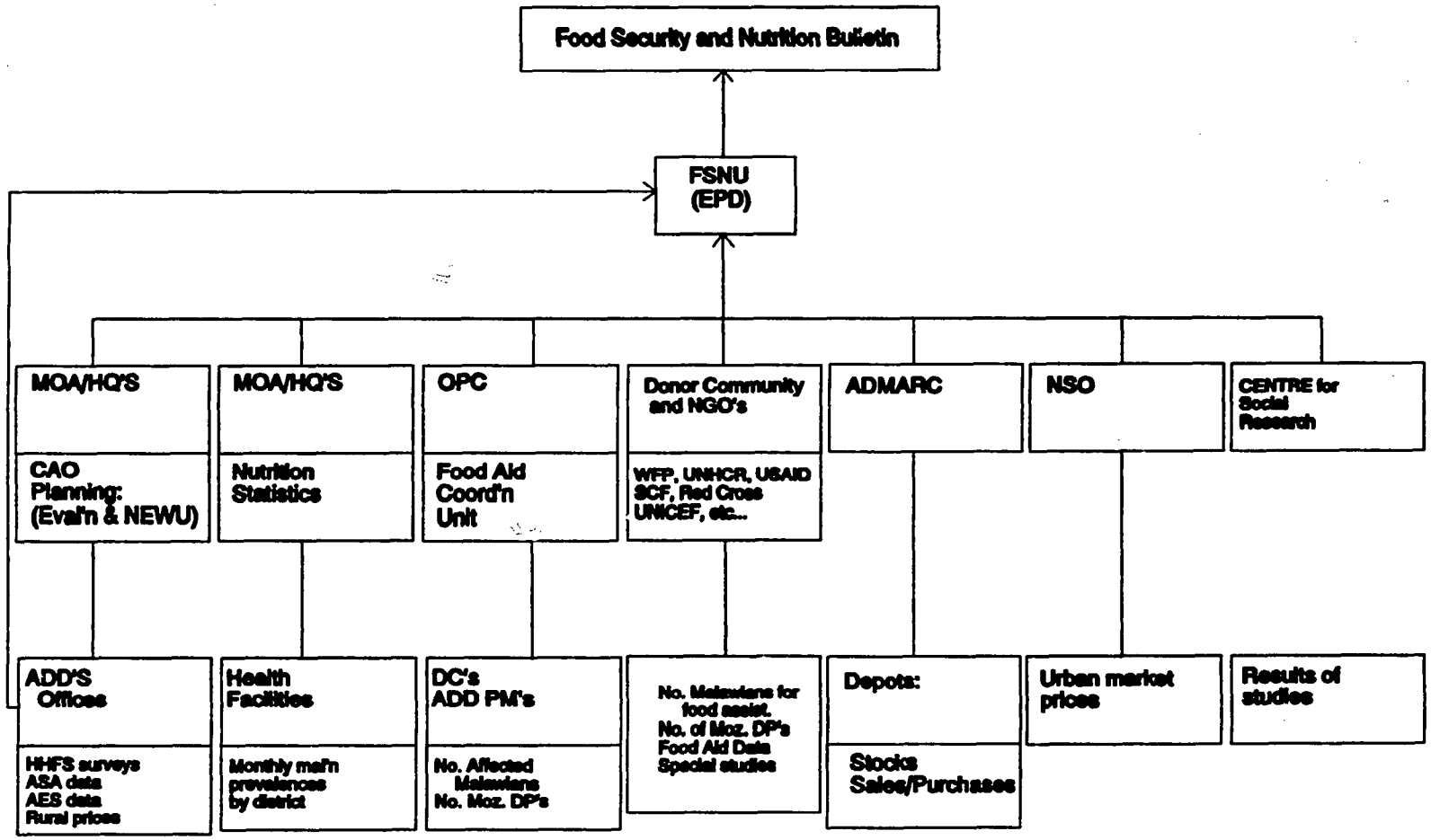

Figure 2. National Food and Nutritional Surveillance System Data Sources and Flows

SECTION III

UTILIZATION OF THE NATIONAL FOOD SECURITY STOCK

The Decision to Use the SGR Stocks

The SGR stocks are used for three different purposes, including

(1) for needy rural dwelling Malawians who have lost crops due to drought or flood;

(2) to fill the commercial food gap and to stabilize prices;

(3) to fill food aid requirements for the Mozambican refugees if food aid is not covered by donor pledges.

For Needy Rural Dwellers. This group, the needy rural dwelling Malawians, is composed of villagers with less than one hectare who grow mostly traditional, relatively late-maturing maize that is, therefore, exposed for a longer period of time to floods or drought, then the hybrid, early-maturing maize. When a flood or drought hits, these people are the first to suffer because their maize for subsistence and as a source of cash is often partially or wholly lost. Without sufficient food and with little or no money, these people require free distributions of food, especially their staple maize, in order to live.

The needs of the rural poor are closely monitored by the Food Security and Nutrition Unit (coordinated by the Food Aid Relief and Rehabilitation Unit (FARRU) of the OPC) operating in the eight different Agricultural Development Divisions (ADD's). The FSNU utilizes information received from the ADDs/FARRU, and crop estimates by MOA and ADMARC, to carry out its on-farm food gap analysis.

When the FSNU decides that there is an emergency need to supply this group with maize, the National Disaster Preparedness and Relief Committee (an interministerial committee currently chaired by the Ministry of Community Services) is alerted. This Committee, then, makes a recommendation to the Secretary of the OPC, who then instructs FARRU to distribute a certain quantity of maize from the SGR. The emergency free distribution of food aid/SGR relief maize is physically done by the District Administration Departments in the OPC through their respective District Commissioners. Also, when SGR maize is to be distributed free to drought or flood victims, non-for-profit non-government organizations (NGO's) or donors may offer to buy the maize from the SGR for distribution through the District Commissioners. NGO's also overlook the distribution of their own donated food (Sanyira, personal communication, 1991).

To Fill Commercial Gap and to Stabilize Prices. The use of the SGR stocks to fill the commercial gap or to stabilize prices also follows an organized decision making process. First of all, crop estimates are made independently by the MOA and ADMARC. The estimates are made three times, starting in January, then in March, and finally in May/June. The FSNU uses a two-sector food gap analysis to determine the maize supply and disappearance equation. It examines the commercial food gap along with the on-farm food gap. Information on maize (grain) stock levels (i.e., ADMARC's total purchases, total sales, and total stocks on balance) is provided on a weekly basis to the FSNU. Based on crop estimates and current

stock levels, the FSNU is able to estimate the commercial food gap. If ADMARC's stocks are expected to be exhausted before the new crop is available, the Food Security and Nutrition Advisory Committee meets to recommend to the Secretary of the OPC a draw down of SGR stocks. ADMARC then buys the stocks from the GRM and sells the stock commercially.

To Fill Food Aid Requirements of the Mozambican Refugees. The influx of Mozambican refugees into Malawi has grown steadily since 1987 from less than 300,000 in August 1987 to over 900,000 in December 1991 (EP&D/GRM, 1991). A similar number of Mozambican refugees may also have mingled into the Malawian society at-large. Malawi's own contribution towards the Mozambican refugee relief program exceeds US$40 million since the operation started in 1987. The 1991 food aid (maize) requirement and donor pledges are 140,000 mt and 79,000 mt, respectively. According to the World Food Program (WFP) their 1991 pledge has not yet arrived in the country and there is concern in regards to maintaining a constant supply of food for the Mozambican refugees (Ostenso, personal communication, 1991). As a result of poor maize harvests in the past couple years in various Southern African Development Coordinating Committee (SADCC) countries, regional stocks of maize are relatively low, meaning that the WFP may not be able to find a ready supply of white maize nearby. Also, this year's attack on a food relief convoy in Mozambique has forced shippers to Malawi to abandon the route through Tete and travel the far longer route through Zambia. These recent developments pose a threat to the flow of food aid shipments to Malawi. Certainly if pledges do not cover the maize needs of the refugees, the situation could get even worse.

The use of borrowed SGR stocks for feeding refugees through the WFP requires the concurrence of the Secretary of the OPC. In recent years, the WFP has annually bought at least 30,000 mt of maize from the GRM and has handled the distribution of the food to the refugees with the assistance of FARRU.

The GRM does not intend to draw down its emergency reserve below 50,000 metric tons (Mhango, personal communication, 1991). However, according to the Pricing Unit in MOA, Malawi cannot afford to replace emergency stocks that are freely distributed. In the past, donors have been asked to provide funding or stocks for replenishment of the SGR.

History of SGR Utilization

Malawi for many years has been considered a food surplus country because of its achievements in accumulating surpluses of maize in its official marketing channels. In 1984-85 surplus grain had accumulated in the country's national reserve to the extent that nearly 180,000 metric tons of maize was necessarily exported to the drought stricken countries of Ghana, Mozambique, Tanzania, Zaire, and Zambia. However, this situation reversed itself dramatically in 1987 when a combination of drought, reduced hybrid maize plantings and the huge in-migration of displaced persons from Mozambique precipitated a serious national food shortage. The situation was made even worse by the destruction of the cassava crop by the mealy bug. The once large SGR was rapidly depleted, and the country appealed to the international community for food aid. Besides the shortage itself, a major difficulty faced by the GRM during this period was the lack of information on the actual numbers of Malawians affected by the drought and cassava crop destruction. As a result, the GRM's estimates of emergency food aid requirements were difficult to make (OPC/GRM, 1991).

In late 1987, other macroeconomic policy measures also influenced Malawi's food security. The Structural Adjustment Program implemented in Malawi led to the liberalization of maize marketing. ADMARC was in control of less maize as private traders had a larger share of the marketing of maize. SGR stocks, then, could not be built up from zero to the target level given the decreased quantity of maize stocks available from ADMARC (Table 1). Also, as ADMARC closed some of its remote markets, many poorer households' food security was affected adversely, as maize was no longer easily accessible to them (OPC/GRM, 1991)

The level of maize stocks in the SGR at the close of the marketing year (March 31) was zero in 1987/88 and 1988/89, 171.4 metric tons in 1989/90, 109.0 metric tons in 1990/91, and a preliminary forecast of 192.0 mt in 1991/92 (NEWS, April 1991). In 1989 the stocks were run down since the GRM didn't have money for buying 180,000 tons (Seidler, personal communication, 1991). That year, WFP purchased 60,000 metric tons of maize from the SGR to use to feed the refugees from Mozambique.

In 1990, the maize crop in Malawi was poor, totaling 1.3 million mt, with ADMARC having bought about 200,000 mt. That year, WFP bought 30,000 mt of local maize and borrowed 30,000 mt from the SGR. The borrowed stocks were replaced by WFP, once the free distribution by the GRM was proven. Also, 24,000 mt was withdrawn from the SGR by FARRU starting February 1991 for free distribution to approximately 2.5 million people to supplement their diets (at 300 grams of maize/person/day) for three months (January-March 1991). In response to that withdrawal, USAID has been replenishing the SGR with a total of 20,000 mt of yellow maize. Because of the low production, ADMARC also borrowed 77,000 mt of maize from the SGR and sold the maize commercially.

In 1991, Malawi had a good crop with about 1.66 million mt of maize, with ADMARC having bought about 264,000 mt (Table 2) while having replaced 75,754 mt of the reserve (Table 3). That year, the EEC purchased 30,000 mt and WFP purchased 27,000 mt from the GRM's SGR for using to feed the refugees. In early December 1991, the level in the SGR stood at 137,481 metric tons (Gunde, personal communication, 1991).

"It would appear that until there is progress on a range of non-price factors affecting consumption and production, and until the private trading sector becomes more viable, ADMARC must maintain large reserve stocks and cover sufficiently wide geographical in order to sell maize in adequate quantities to stabilize prices (Takavarasha, 1990)."

Recycling the SGR Stocks

The turnover of the SGR is done through the course of ADMARC's commercial and/or non-commercial maize transactions. For example, recycling took place in 1990 and 1991 when ADMARC bought 77,000 mt of maize from the SGR for commercial sales that year and replaced the same amount back into the SGR in 1991. In recent years, the stocks in the SGR have been recycled each year when WFP borrows (as much as 60,000 mt annually) and later replaces the stock with fresh stocks. Recycling, then, of maize stocks in the SGR has been accomplished regularly through commercial and/or non-commercial means.

TABLE 1

ADMARC Maize Purchases and Sales
1984/85-1991/92 (April 1 to March 31).

Year	Purchases	Sales
	mt	
1984/85	294,302	109,800
1985/86	273,432	163,800
1986/87	108,024	287,000
1987/88	58,951	130,200
1988/89	122,233	69,900
1989/90	231,337	177,000
1990/91	200,227	281,900
1991/92	264,199	

Source: ADMARC

TABLE 2

ADMARC Maize Stock Balance, Sales, and Purchases by Region
1991/92

Area Purchased From	As of Dec 7-13 Stock Balance	Total Sales	Total Purchased
	mt		
Southern	77,473	18,560	52,019
Central	70,351	33,032	155,372
Northern	30,445	8,348	56,808
Total	178,268	59,940	264,199

Source: ADMARC

TABLE 3

SGR Stock Balance
1991

Opening Stock (April 1990)	180,000 mt
Borrowed by ADMARC	-77,000 mt
Free Distribution by FARRU	-24,000 mt
	79,000 mt
Opening Stock (April 1991)	79,000 mt
Returned to reserve by ADMARC	+75,754 mt
Bought by UNHCR (as of Dec 7-13)	-19,279 mt
Remaining in reserve	135,475 mt (137,480,651 (Dec 7-13) according to Gunde, pers. comm., 1991)

SECTION IV

FOOD SECURITY INFORMATION SYSTEM

The National Early Warning System (NEWS) is a joint program of the GRM and the Food and Agriculture Organization (FAO) of the United Nations. It is funded mainly by the Danish International Development Agency (DANIDA). The project intends to improve national food security through the establishment of a system which will provide advance information on crop production and food supply in general, and will alert those concerned well in advance of an impending food shortage or surplus so that suitable and timely remedial action can be taken (NEWS, 1991).

The NEWS is based in the Planning Division of the MOA in Lilongwe, and the Meteorological Department at Chileka. The NEWS works closely with other institutions of the MOA, including the Department of Agriculture, the various ADDs, and the Department of Agricultural Research. Information and assistance is also provided by the OPC, the National Statistics Office (NSO), the Ministry of Health, ADMARC, various donor groups, and others.

The National Early Warning Unit (NEWU), which manages the NEWS, estimates the smallholder crop three times a year, January, March, and June. The estimates had been done using subjective methods in the past, however, new crop estimating methodology that is statistically sound, economical, practicable, and verifiable is now being put in place. ADMARC also carries out its own independent crop estimates using its market depot staff and trained crop assessors. Both the crop estimates of NEWU and ADMARC are presented at the National Crop Estimates Committee (NCEC) meetings in January, April, and March each year (OPC/GRM, 1991).

The NEWU issues a quarterly bulletin intended to provide information on the current and projected food security at the national, regional, and household level. The forecasted national food situation for the 1991/92 marketing year is given in Table 4.

The preliminary forecast of maize imports for the 1990/91 marketing season is 25,000 mt, compared to the 11,000 mt received last year. Most of the forecast imports will involve outstanding food aid pledges and will apparently go towards the rebuilding of the SGR.

Of course the critical issue with the NEWU is how early can the estimates on the maize crop be used to project maize requirements beyond that which is produced domestically. Historically, there has been no significant change in estimated maize production from the second to the third and final crop estimates. The difference between the two estimates is usually less than 1% as shown in Table 5. These results indicate that the GRM could anticipate well in advance (March) and arrange for imports (if necessary) before a shortage of maize occurs and certainly well before the SGR stocks drop below 50,000 mt.

The NEWS in Malawi has counterparts in the nine other member countries of the SADCC. The Regional Early Warning Unit for Food Security in Harare, Zimbabwe provides technical assistance and coordinates activities among the national units. Phase II of all SADCC early warning systems began in January 1991. Under this second phase, which will last five years, there will be substantial strengthening of early warning capabilities, notably in the areas of remote sensing, and food and nutrition monitoring at the regional and household levels (NEWS, 1991).

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TABLE 4

Forecast National Food Situation for the 1991/92 Marketing Year

ITEM	MAIZE (1,000 MT)
Opening stocks on April 1, 1991	117.0
Forecast domestic production	1650.0
Total domestic availability	1767.0
Forecast of consumption	1600.0
Carry over requirements	50.0
Total requirements	1650.0
Surplus (+) or deficit (-)	117.0
Planned exports for marketing year	0.0
Import requirements	0.0
Forecast imports for marketing year	25.0
Forecast closing stocks March 3, 1991	192.0

Source: NEWS, April 4, 1991

TABLE 5

Comparison of Maize Crop Estimates at First, Second, and Third Meetings*
1982/83 to 1980/91

CROP YEAR	PRODUCTION (1,000 MT) FIRST MEETING	SECOND MEETING	THIRD MEETING	DIFFERENCE 1st and 2nd MEETING (1000 MT)	%	DIFFERENCE 2nd and 3rd MEETING (1000 MT)	%
82/83	--	--	1369.4	--	--	--	--
83/84	--	1372.5	1397.8	--	--	25.3	1.8
84/85	1352.4	1355.3	1355.2	2.9	0.2	-0.1	-0.0
85/86	1722.7	1293.1	1294.0	-429.6	-24.9	0.9	0.1
86/87	1226.6	1228.2	1218.5	1.6	0.1	-9.7	-0.8
87/88	1367.9	1424.5	1426.9	56.6	4.1	2.4	0.2
88/89	1557.1	1520.1	1509.5	-37.0	-2.4	-10.6	-0.7
89/90	1811.9	1343.0	1342.8	-468.9	-25.9	-0.2	-0.0
90/91	1638.4	1696.6	1600.0 E	58.2	3.6	-94.3	-5.7 E

*The First Meeting is usually in January, the Second Meeting is usually in March, and the Third Meeting is usually in June.

E - Estimated by NEWS
Source: NEWS

SECTION V

AGRICULTURAL DEVELOPMENT AND MARKETING CORPORATION

ADMARC was set up in 1971 to develop estates and promote commercial and industrial ventures. It was initially concerned mainly with crop marketing, but soon after its inception, ADMARC grew quickly to become a major development finance institution. It raised funds mainly by paying farmers domestic prices that were less than world market prices, even when allowing for transportation and marketing costs. Since ADMARC purchased crops mainly from the smallholder sector, the government, through ADMARC, effectively taxed smallholder farmers but not the owners of the estates. In the early 1980's, ADMARC was instructed by the GRM to pay the smallholder farmers more remunerative prices (Takavarasha, 1990).

In 1981, the GRM directed ADMARC to set up the SGR in Lilongwe, the capital located in the central region of the Republic of Malawi. The central region was found to be a very good location for the SGR because maize production is highest in this region, hence, the maize surplus from this region could cater for the filling of the silos without incurring very high transport costs (FAO, 1989). The silos, built in 1975, were initially owned by ADMARC, but in 1987, in view of ADMARC's financial crisis, the GRM bought the silos and grain reserve from ADMARC. However, ADMARC is still responsible for appointing personnel to work at the silos and its operations. The procurement, maintenance, and handling of the maize stocks in the SGR is done by ADMARC. The GRM pays ADMARC a fee for the costs of maintaining the silos and the SGR (Scarborough, 1989).

ADMARC's major roles in food security is in maintaining the SGR and in carrying out its price stabilization activities. When the GRM decides to acquire or release maize stocks from the SGR, the GRM contacts ADMARC. ADMARC then either supplies the GRM with maize stocks (if available) or releases maize stocks from the SGR. ADMARC is also approached by the GRM whenever food aid arrives in country to be used to replenish the SGR.

ADMARC's role in maize price stabilization is becoming more and more apparent as the market is gradually liberalized and the private traders assume a greater share of the maize marketings. ADMARC has been buying between 40 to 90 percent of the total marketed surplus (Mphande, personal communication, 1991). When the maize crop is poor, ADMARC does not buy so much maize because many producers can get a better price from private traders. When the maize crop is good, producers sell the majority of their marketed surplus to ADMARC at prices the same or higher than the private sector. With over 1000 market depots and large warehouses spread throughout the country, ADMARC is in a position to continue to defend the producer floor price as determined by the GRM. However, as the private traders vertically integrate their market operations, ADMARC may find its quantity of maize purchases dropping. In future years, moreover, ADMARC may not have sufficient stocks to fill the request of the GRM for maize stocks to replenish the SGR. To fully replenish the SGR, the GRM may need to buy direct from producers or traders. With less quantities of maize on hand, defending the maximum retail price with sufficient injected stocks will also become more and more a problem.

ADMARC Structure and Storage Capacity

ADMARC is a large, tightly run organization that is managed quite efficiently as compared to many other parastatals set up in a similar way in other sub-Saharan countries. Besides having Regional Managers, ADMARC has a Marketing Controller for each of the commodities it handles, including grains (maize and rice), tobacco, groundnuts, cotton, and general produce. The Maize and Rice Marketing Controller and the Financial Controller of ADMARC maintain up-to-date and accurate marketing and financial information on the operations of the SGR and its maintenance costs/financing, respectively. The SGR at the silos in Lilongwe are managed by a Silo Superintendent, a Silo Foreman, and their technical staff and laborers.

ADMARC, which dominates maize trading in much of Malawi, performs much of the off-farm storage. ADMARC's warehouse capacity is extremely large, and is used for agricultural inputs, a variety of grains and oilseeds, and many types of packaging material used by various processors. However, the security reserve grain, which is entirely local maize, is owned by the government, not by the corporation, and is stored not in warehouses, but in an elevator owned by the government and operated by ADMARC.

The entire reserve is kept in the bulk facility at Lilongwe, which consists of 36 storage tanks about 50 feet in diameter and 120 ft tall. The tanks are of slip-form concrete construction and have concrete, conical roofs. The nominal capacity of each tank is 5,000 mt, thus the total capacity is 180,000 mt. Built in 1980 by a South African company and financed through South Africa, the elevator is a clean, well-maintained facility with modern equipment and design features.

Although the in-bound handling capacity is rather small for such a large facility, the elevator contains two grain cleaners, which apparently are used every time grain is moved. It also has an adequate dust collection system and an automated fumigant dispenser. It lacks a grain temperature monitoring system and bearing temperature monitors, but the equipment is clean, lubricated, and painted. The cleanliness and maintenance was very good.

Staff Training

The ability to maintain grain quality during storage depends on trained staff, proper equipment and structures, and an administrative system that ensures proper use of the staff and facilities. ADMARC seems to be strong on the first two and a bit weak on the third, but the final product is good.

ADMARC recruits its management-level people from agriculture majors graduating from the University. The new recruits are placed with experienced managers to learn their jobs. According to long-time staffers, personal integrity is a key prerequisite for employment and in evaluation for promotion. In addition to on-the-job training, ADMARC maintains a permanent, three-person training department which coordinates periodic inservice workshops on various aspects of ADMARC's many activities.

Several of ADMARC's people have also received training outside the organization. Over the past five years three persons have attended Kansas State University's Grain Storage and Marketing Short Course. In 1989 many were trained in pest control techniques through an in-country project sponsored by FAO. Others were sent to the National Resource Institute's three-month course in England. An additional seven were trained in an Australian program in which students from all SADCC countries received several months of training over an 18-month period. The elevator staff received operational instruction by the South Africans after the elevator was completed.

Pest Control and its Effectiveness

When the author visited the elevator complex, two-year-old maize was being turned (passed from one silo to another), cleaned, and fumigated. This process is said to take place at reception and every six months thereafter. Grain is said to also be treated with Actellic (sprayed on the bag) at the buying station or local assembly point, and fumigated at the regional warehouse before it reaches the silo (if it is to go into the reserve). Each silo was said to be sampled bi-monthly. However, sources did not agree on how it was sampled, and the method described by the sanitarian sounded implausible. The bi-monthly inspection report forms are ostensibly sent to the operations manager, who was not anxious to show them. All this leaves some doubt that inspection - which is a difficult task in bulk grain - is done as regularly as reported.

Sampling and inspection are also said to occur upon receipt, although the classification is simple and subjective. The corporation has a warehouse procedures manual which prescribes the tolerance standards for foreign material, damaged grain, etc., but the procedure they actually use is to look at a handful, and reject the load if it has too much impurity or "rotten grain". Excessive moisture content is apparently not a problem, since ADMARC field people do not open a buying station until they are sure the moisture content of grain in the area is less than 12.5 %.

At the time of the visit, fumigation was being accomplished without warning placards or gas masks at the bintop site, and the smell of fumigant was strong near the silo entrance. However, the technique was good and the material appeared fresh and in good condition.

In the regional warehouses within the elevator complex, well-built stacks, properly identified with stack cards, had recently been fumigated. Fumigation and inspection dates were recorded on the card. Although the tarpaulins and other fumigation equipment were said to be in the field, and therefore not available for inspection, the staff talked knowledgeably about the subject. They complained about the cost of gas masks and canisters, and lamented the problem of transporting the heavy tarpaulins and sand snakes. Live insects were few in either the elevator or the warehouse. All evidence pointed to an organization skilled and experienced in grain quality maintenance.

At the Limbe site just outside of Blantyre two of the large regional warehouses (identical to those at Lilongwe) were observed. They were clean, orderly, nearly pest-free, and reflected an organization skilled at its job. Monthly warehouse inspections were recorded, stack cards contained information about entry date,

quantity, inspection dates, physical inventory dates, and fumigation dates. The staff spoke knowledgeably about details of pest control that only an experienced operator would be likely to know.

A stack of carry-over maize from the 1990 harvest was observed. It was clean, insect-free, and as saleable as when it entered the warehouse. This was not security stock grain. However, the fact that it was kept in ADMARC warehouses for more than a year in excellent condition means that, at least in this case, the government could, if it wished, add to the reserve from ADMARC's carry-over working stocks without concern about the quality and storability of the maize.

At Limbe as in Lilongwe, fumigation equipment was all being used in the field. Again, the monthly inspection forms, cleaning schedules, corrective action documentation, inventory of pest control materials forms, etc. that one would expect to find within an organization that handles perishable products was not much in evidence. Nevertheless, quality maintenance appears to be functioning, even if the paperwork is thin. This part of the system works.

The best indication of ADMARC's ability to maintain grain quality long-term came from samples taken in the Lilongwe elevator as the two-year-old maize was turned. These samples contained 3 to 5 % insect-damaged kernels and had an insect odor. A U. S. grain grader would probably have declared the grain Sample Grade because of objectionable odor, and the grain would not have been terribly welcome at an elevator in Oklahoma or Iowa. However, real damage was slight, it was on its way to cleaning and fumigation, and it would clean up fairly well in the cleaning house of the average mill. Compared to the average maize observed in the markets of the countries visited by this team, its quality was adequate. This indicates that ADMARC is capable of maintaining reserve grain for more than two years in a condition adequate for the market for which it is intended.

Cost of Quality Maintenance

The electricity consumed when turning grain usually costs much more than the fumigant. Also, the material ADMARC cleans out during each turning represents weight lost. ADMARC people estimated the cost of a fumigant pellet at 0.1 Malawian Kwacha, or about 3.7 cents USD (at about Kwacha 2.668/USD). Actual fumigation costs for ADMARC in 1990/91 were only Kwacha 364 on an average 161,154 mt or about Kwacha 0.002/mt (Appendix 2) or USD0.0008/mt. In comparison, electricity costs for maintaining the SGR (a portion of the costs being for turning the maize) and the silos totalled Kwacha 145,214 (about USD54,428) in 1990/91.

The total cost to ADMARC for maintaining the SGR and the silos in 1990/91 was Kwacha 1,062,555 (Appendix 2, Table 7). The average maize stock level in the SGR in 1990/91 was 161,154 mt (Appendix 2, Table 8). The cost of maintaining a metric ton of reserve maize in the silos in Lilongwe in 1990/91 was estimated at Kwacha 6.59/mt, i.e., about USD2.47/mt (Kapusa, personal communication, 1991).

SECTION VI

DONORS SUPPORTING THE FOOD SECURITY PROGRAM

Malawi began to appeal for food-aid donations in 1986 at the time of a massive influx of refugees from Mozambique and also very destructive mealy bug infestation in the Northern Region (FARRU/GRM, 1991). Donors responded favorably with both commercial and predominantly emergency food aid. Due to delays in shipping the grain from donor countries the first consignment did not start arriving into Malawi until 1987. From 1986-88, the SGR was reduced to almost zero due to a series of disasters, including those described above.

As part of its food aid assistance, the donors (particularly USAID and the EEC) have provided the GRM with maize sufficient to reconstitute its SGR after it had been completely depleted in 1988/89 (Appendix 3). By April 1990, the SGR had been re-constituted up to the level of 171,470 mt.

However, due to drought and floods in parts of the country in early 1990, the SGR was reduced to 106,400 mt in July 1990. At the GRM's request in early 1990 for further food aid, donors supplied a total of 28,200 mt of maize and 1,243 mt in 1990. Additionally, the donors donated 10,000 mt of maize for sale to cover distribution costs and 1,000 mt for food for work programs.

In 1990/91, the GRM requested from donors 81,000 mt for the estimated food aid gap for free distribution to needy Malawians affected by the drought. Those donors donating grain or money to buy grain included WFP, Japan, Italy, and USA.

Also, WFP has been purchasing or borrowing at least 30,000 mt of maize annually (at least for the past three years) from the SGR for distribution to the Mozambican refugees. The stocks have generally been replaced with newly harvested white maize, thus, recycling a significant amount of SGR maize each year.

As was mentioned in the section on EWS, the Danish Government has financed much of the work done by FAO on developing an EWS that is able to forecast crop production and maize stock trends well in advance of potential market supply problems.

SECTION VII

MAIZE PRICING POLICY'S IMPACT ON SECURITY STOCK LEVELS

The Pricing Unit in the Ministry of Agriculture is responsible for recommending to the National Crop Pricing Advisory Committee the maize prices including the producer floor price, depot delivered, consumer, and maximum retail prices, for the next crop and marketing year. The Committee, chaired by EP&D and composed of representatives of the Ministry of Trade, Ministry of Agriculture, Ministry of Finance, Reserve Bank of Malawi, ADMARC, et.al., settles on the prices in July each year and publicly announces the prices the following September.

The first part of this section describes the pricing system established by the Pricing Unit. The second part of this section describes the impacts of this pricing system on the stabilization stock levels.

Pricing Policy

Producer Floor Price. Producer prices established by the GRM are pan-territorial and pan-seasonal. In the early 1980's, producer prices were set relatively high resulting in successive years of surplus maize production. However, from 1983/84 until 1986/87 the GRM's producer prices remained unchanged, and, of course, in real terms decreased substantially (Table 6).

In 1988/89, the Pricing Unit determined the producer floor price based on three criteria, including the return to labor in growing maize, the ratio of the value of the maize divided by the cost of fertilizer, and the average of the import and export parity prices. Currently, all but the last of these criteria are used by the Pricing Unit in obtaining its recommended producer price. The average of the import and export parity prices is no longer used because import parity prices are too high (Mphande, personal communication, 1991). The Pricing Unit examines the return to labor for maize production by comparing it with the return to labor for production of other crops that may be substitutes for maize. The Unit seeks to maintain a producer price that is twice the cost of fertilizer.

Depot Delivered Price. In 1987, floor prices were differentiated by market level in order to increase margins and to encourage private agents to undertake assembly and transport functions. Implementation of these decisions, unfortunately occurred under unfavorable circumstances marked by a maize shortage and a large influx of refugees (Takavarasha, 1990).

Nevertheless, the incentive to private agents to undertake assembly and transport functions has remained a part of the policy for determining the depot delivered price. The depot delivered price is the price paid by ADMARC to those who sell over one ton of maize at designated, more centralized depots. The price is calculated at 20% more than the producer floor price. Most purchases by ADMARC are made at the producer floor price, simply because transport to haul maize from remote villages to ADMARC's designated depots (where depot delivered prices are available) is expensive.

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Consumer Price. The consumer price is the maize price paid to ADMARC by mills, traders, or consumers. The margin between the producer floor price and the consumer price is intended to cover at least the majority of the costs incurred by ADMARC in its maize marketing activities. In 1986, consumer prices of maize were set at a cost recovery level (Takavarasha, 1990). In 1990/91, the consumer price was established by the Pricing Unit at the expected breakeven price for ADMARC (Table 6). The GRM has been paying ADMARC the difference between its actual costs in marketing maize and the consumer price.

Maximum Retail Price. ADMARC's agents, i.e., those traders buying maize from ADMARC and re-selling the maize retail, are allowed to buy maize from ADMARC at the consumer price and sell the maize at the maximum retail price.

Retail prices for cream of maize (a staple consumer food item not sold by ADMARC) in various retail grocery stores located in Lilongwe and Blantyre were observed (December 1991) to be at the same price (Kwacha 16.50/20 kg). Evidently in the major cities in Malawi, the high number of private retailers has kept the consumer prices for cream of maize competitive.

Impact of the Pricing Policy on the Security Stock Level

The pricing policy impacts both the level of the SGR and the stabilization stock level. The relatively high producer prices for maize established by the GRM in the early 1980's led to high annual purchases by ADMARC through 1985/86. With annual maize sales by ADMARC lower in some years than one-half of annual purchases, ADMARC was in a position where it could supply and did supply the GRM with sufficient maize quantities to maintain the level of the SGR at or about the 180,000 mt level. Likewise, during this period ADMARC was able to maintain adequate stabilization stocks (though these stocks were really working stocks since the private traders had very little share of the marketed surplus) to keep the market supplied with maize at all times.

Since the 1985/86 crop year, with producer prices having levelled off and more recently been adjusted moderately higher, ADMARC's average annual sales have exceeded its average annual purchases. During this period, ADMARC has seldom been in a position to supply the GRM with the requested quantity of stocks for the SGR. Consequently, the level of the stocks in the SGR has fluctuated from a prolonged period at zero stocks to as high as the targeted level. Also since 1985/86, ADMARC's stabilization stocks have fluctuated due to fluctuating purchase levels and at times due to various markets having been undersupplied.

The impact that the maximum retail price has on the level of stocks in the SGR is as follows: if ADMARC's stabilization stock quantities were relatively low while actual retail prices charged by the private sector in the market exceeded ADMARC's consumer price significantly (by greater than 50%), then the GRM could allow ADMARC to borrow stocks from the SGR for stabilization purposes. To date, private retail prices have not reached such a high level and so far stocks from the SGR have not been used by ADMARC for the specific purpose of influencing retail prices lower. ADMARC has borrowed stocks from the SGR at times when its working stocks would have otherwise been depleted.

TABLE 6

Producer, Depot Delivered, Consumer, and Maximum Prices 1968/69 to 1991/92.

Crop Year	Producer Price	Depot Delivered Price*	Consumer Price	Maximum Price (Retail)
	Tambala/kg			
1968/69	2.00			
1969/70	2.00		4.44	
1970/71	3.00		4.44	
1971/72	3.00		4.44	
1972/73	3.00		4.44	
1973/74	3.00		4.44	
1974/75	4.00		5.56	
1975/76	5.00		7.33	
1976/77	5.00		7.33	
1977/78	5.00		5.50	
1978/79	5.00		7.33	
1979/80	6.60		10.00	
1980/81	6.60		10.00	
1981/82	11.10		12.22	
1982/83	11.10		14.44	
1983/84	12.20		15.56	
1984/85	12.20		15.56	
1985/86	12.20		16.50	
1986/87	12.20		20.00	
1987/88	16.60		24.44	
1988/89	24.00		24.44	
1989/90	26.00		36.11	
1990/91	27.00	32.78	39.44#	44.22
1991/92	29.70	35.64	43.39	48.11

* Calculated at 20% above the producer price, requires the sale of at least 1 ton of maize.
# Breakeven price
Source: MOA

SECTION VIII

IMPACTS OF STOCK MANAGEMENT POLICIES

Since ADMARC is the main buyer and seller of the marketable surplus in Malawi, ADMARC's stabilization policy including the prices it buys and sells maize, plus the level of stocks it or the GRM has on hand in the SGR have the most significant bearing on the benefits accruing to the producer or the consumer.

The stabilization policy benefits producers in Malawi primarily during those years of high maize production when ADMARC buys at the floor price. The difference between the floor price and what the private retail price would have been had ADMARC not bought at the floor price is the benefit to the producer. In Malawi, private traders who buy from producers and sell to ADMARC at the depot delivery price must be licensed and must buy at the floor price. Other private traders, who are not licensed, buy maize at free market prices that are not well documented.

The fact that ADMARC maintains working stocks and maintains up to about 180,000 mt of maize in the silos in Lilongwe has a stabilizing impact on the producer prices and consumer prices any time of the year. For example, private traders generally buy a greater percentage of the maize when the domestic maize production is relatively low. However, given a year when domestic production is low, the fact that ADMARC maintains quantities of maize near the capacity (180,000 mt) level in the silo, keeps the private trader from offering the producer a very high price since the trader may not be able to make a profit. The private trader can buy from the producer and sell at whatever price the market will bear. However, those private traders with licenses to buy from producers and then sell to ADMARC (generally considered the most convenient buyer of maize), sell their maize at the depot delivery price which has been providing these traders with at least a normal profit (on a gross margin of over 20%). The point is that a private trader cannot expect consumer prices to reach levels that far exceed the consumer price offered by ADMARC when the silos are near capacity and when domestic stocks (including those stocks in the silos) of maize are considered adequate for that marketing year.

Although the maize market has been fairly well supplied by ADMARC in recent years, maize consumer prices have reached well over 50 kwacha/kg in all four major urban areas, (particularly since January 1991). That price offered by the private traders compares with the 0.3944 kwacha/kg consumer price offered by ADMARC (FSNU, 1991). The GRM has estimated that the private retail market price could reach a level nearly 50 percent higher than ADMARC's consumer price. It is the GRM's intention to have ADMARC add a significant quantity of stocks to the market if private retail prices exceed ADMARC's consumer price by over 50%. Currently, then, the consumer that buys from ADMARC has been and is continuing to be subsidized by the GRM. The subsidy is equal to the difference between the private retail price and ADMARC's consumer price. Multiplying ADMARC's sales each year times the difference between the private retail price and the consumer price offered would represent approximately the benefits accruing to the maize consumers.

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SECTION IX

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APPENDIX 1

PERSONS AND ORGANIZATIONS CONTACTED

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APPENDIX 2

TABLE 7

ADMARC's Expenses for Maintaining the SGR and the Silos
1990/91

ITEM	EXPENSE
	-Kwacha-
Pension Fund Contributions	5182
Provident Fund Contribution	-79
Salaries and Emoluments	35699
Wages Permanent	23473
Feeding Labor	8703
Local Travelling and Subsistence	1924
Motor Vehicle Repairs	5564
Maintenance - Buildings	5813
Maintenance - Furniture and Fittings	56
Maintenance - Plant & Machinery	339064
Rents Paid/Storage Hired	32400
Rates	6726
Water	10316
Electricity and Power	145214
Stationary	7393
Telephone	3070
Fuel	12714
Uniforms	708
Security Expenses	516
Cleaning Materials	3534
Gratuities	5847
Medical Expenses	663
Insurance	147010
Sundry Expenses	3303
Food and Accommodation	2187
Tea, Milk, and Sugar	715
Depreciation - Plant & Machinery	2455
Fumigants	364
Wages Temporary	147566
Water Recovery	-463
Casual Laborers	770
Motor Vehicles Control	3863
Building Supervisors Contribution	3670
TOTAL	965959
Add 10% of Total Maintenance Fee	96595.90
GRAND TOTAL	1062554.90

Source: ADMARC

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TABLE 8

Average Maize Stock Level in the SGR
1990/91

MONTH	STOCK LEVEL
	-----mt-----
April	171,278
May	167,445
June	165,787
July	165,442
August	164,256
September	163,672
October	166,281
November	169,803
December	169,759
January	169,745
February	150,700
March	109,678
AVERAGE	161,154

Source: ADMARC

APPENDIX 3

TABLE 9

Commercial Food Aid Donations
1987-1991

DONOR\YEAR	1987/88	1988/89	1989/90	1990/91	1991/92
	mt				
Australia		5,000			
CIDA		5,300			
EEC		15,000			
Germany	10,000				
Japan	2,900			5,000	
South Africa		3,000			
United Kingdom		30,000			

Source: FARRU/GRM

TABLE 10

Emergency Food Aid Donations
1987-1991

DONOR\YEAR	1987/88	1988/89	1989/90	1990/91	1991/92
	mt				
Australia					
Austria		2,000			
Baptist	900				
Belgium		1,000			3,000
CIDA		5,300			2,000
China (Cash)		1,000			
EEC	13,000	10,000			10,000
France	1,200				
Germany		5,000	5,000		
Italy	5,000*		4,000*	981*	
Japan		2,725	4,000		
Lutheran Church	100				
Malawi RedCross	12,000				
Netherlands	15,000				
South Africa					
UNHCR	1,500*				
United Kingdom	5,000				
USAID	20,000	10,000		20,000	
WFP	5,000		10,000	10,000	

Source: FARRU/GRM

MALI FOOD SECURITY PROGRAM CASE STUDY

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ACRONYMS

AEN	Aide de l'Eglise Norvegienne (Aid of the Norwegian Church)
CADB	Cellule d'Appui au Developpement à la Base (Economic Development Support Unit)
CCA/ONG	Comité de Coordination des Actions des ONG (Non-Governamental Organizations Action Coordinating Committee)
CCE	Commission des Communautés Européennes (European Community Commission)
CEE	Communauté Economique Européenne (European Economic Community)
CEFODOC	Centre de Formation et de Documentation (Documentation and Training Center)
CNAUR	Comité National d'Action d'Urgence et de Réhabilitation des Zones à Risque (National Committee for Emergency Action and the Rehabilitation of At-Risk Zones)
COC	Comité d'Orientation et de Coordination (Coordinating Committee)
CNAVS	Comité National d'Aides aux Victimes de la Sécheresse (National Committee for Assistance to Drought Victims)
DNA	Direction Nationale de l'Agriculture, Ministère de l'Agriculture (National Agriculture Department, Ministry of Agriculture)
DNSI	Direction Nationale de la Statistique et de l'Information, (National Office of Statistics and Information)
EPIC	Etablissement Public à caractère industriel et commercial (a Publicly Owned, Commercial Enterprise)
FRG	Federal Republic of Germany
GRM	The Government of the Republic of Mali
MAT	Ministère de l'Administration Territoriale (Ministry of Territorial Administration)
MEF	Ministère de l'Economie et des Finances (Ministry of Economics and Finance)
MFC	Ministère des Finances et du Commerce (Ministry of Finance and Commerce)
OPAM	Office des Produits Agricoles du Mali (The Malian Office of Agricultural Products)

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PAM	Programme Alimentaire Mondial (World Food Program)
PSA	Programme de Sécurité Alimentaire (Food Security Program)
PRMC	Programme de la Restructuration du Marché Céréalier (Cereal Market Restructuring Program)
SNS	Stock National de Sécurité (National Food Security Stock)
SIM	Système d'Information du Marché (Market Information System)
SAP	Système d'Alerte Précoce (Early Warning System)

SECTION I

FOOD SECURITY POLICY

Mali's food security policy is based on a recently introduced reliance on the private sector. The liberalization of the economic environment which began in 1982 and is entering its final stages in 1991 is expected to increase food security by contributing to increased availability and stability of food supply through local production and liberal internal and external trade. Access to food is expected to be enhanced by personal incomes earned through increased and diversified productive activities, stimulated by market-directed incentives.

Prices have been deregulated and market price collection and reporting programs have been put in operation. Commercial regulations have been simplified. Credit and training in the operation of grain marketing enterprises are flowing toward all sizes of merchants and village-level organizations. It is expected that many of these private sector merchants and village-level associations will use the increased level of price and marketing information and credit to profit from storage and transportation enterprises--activities that tend to stabilize the availability of cereals in time and space.

Parastatals that once dominated the market have been stripped of their monopoly power and their State subsidies and have been subordinated to the private sector. The parastatal that once dominated the cereals market is continuing to have its list of responsibilities reduced. It's only important function now is the maintenance of the national security stock, which is also destined for reduction as famine early warning systems and private market channels are strengthened. However, reliance on the market for food security is not complete. The State still controls the capability to store and deliver emergency food aid in the form of cereals. It is significant, however, that even in this limited realm of activities the State must share its power.

SECTION II

CONTROL OF THE NATIONAL FOOD SECURITY STOCK

Government Structures

Food security in Mali is a cooperative effort between the Government of the Republic of Mali (GRM), the international donor community and a growing private sector which includes non-governmental assistance organizations (NGOs), merchants, and community self-help associations. The GRM is represented by the Orientation and Coordination Committee, (Comité d'Orientation et de Coordination, COC). The COC is an interministerial committee, chaired by the minister of Economics and Finance (Ministère de l'Economie et des Finances, MEF) and charged with the development and implementation of the nation's cereals market policy. The COC also supervises the multi-donor Cereals Market Restructuring Program (Programme de la Restructuration du Marché Céréalier, PRMC) and the German financed Food Security Program (Programme de Sécurité Alimentaire, PSA).

The PSA built the national food security stock warehouses, donated most of the initial stock and currently provides financial and technical assistance to maintain it. The PRMC provides a mechanism for donor coordination and solidarity in dealing with the GRM on the use of the national food security stock and other policies relating to restructuring the cereals market in Mali. The PRMC, described by USAID/Mali, as "a highly effective tool for policy dialogue with the GRM," serves a critical role in coordination of food aid actions among donors. The executive committee of the PRMC, the donors' Management Committee, is the homologue of the COC and represents the government-level donor community in programming the use of development and food aid assistance. The major objective of the PRMC is a complete restructuring of the cereals market in Mali from its previous state-owned monopolistic structure to a private-sector, multi-firm, competitive market structure. This restructuring, which is in its final stages, is expected to significantly enhance the food security of the nation.

To assure the food security of the nation, however, the State has retained control of enough of the previous parastatal system to store food aid and organize its delivery. The national food security system is now composed of two agencies. One of these, the Malian Agricultural Products Office, (l'Office des Produits Agricoles du Mali, OPAM), has the responsibility for maintaining the national security stock. The second organization, the National Committee for Emergency Action and the Rehabilitation of At-Risk Zones (Comité National d'Action d'Urgence et de Réhabilitation des Zones à Risque, CNAUR) of the Ministry of Territorial Administration (Ministère de l'Administration Territoriale, MAT), has the responsibility of identifying the areas in need of food assistance and the quantities to be distributed. In an effort to minimize and carefully target low cost or free food distribution, the donor community, through the PRMC, has funded an additional "early warning system" for identifying and quantifying emergency food needs. This system is referred to using its French acronym, SAP (Système d'Alerte Précoce) and is housed administratively under the CNAUR.

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The decision to use the national security stock is a consensual decision taken in a joint meeting of the COC and the PRMC donors' Management Committee. The actual decision relates to the approval or modification and approval of food distribution plan composed of two parts:

- a proposed plan (Plan de Ravitallement) for selling cereals to undersupplied markets (markets in which an effective demand exists yet supplies are "inadequate"), and

- a proposed plan for free food distributions.

The decision to use the national security stock must be accompanied by a firm commitment, enforced by the PSA, to replenish the stock. Due to the GRM's current inability to provide funds for this purpose, the commitment must come from donors and usually comes from among the PRMC donors group. Once the distribution plan is approved, OPAM releases the grain to the CNAUR from designated OPAM food security warehouses located in the eight regions of the nation. CNAUR then hires private truckers to transport the grain to sub-sub-regional centers where local food distribution committees release the grain to village-level authorities for ultimate distribution to individuals.

Considerable tension exists between the donor community and the GRM over the quantities of food to be distributed and the targeted population. Much of this tension derives from the different criteria for identifying nutritionally at-risk people used by the CNAUR and the SAP. The CNAUR, under the direction of the GRM, appears to prefer more liberal criteria. Significantly, the use of more liberal criteria results in more food aid reaching more villages than necessary for food security purposes and may actually end up as a means of subsidizing GRM functionaires. The SAP, however, favors stringent criteria which limit the quantities of food aid in an effort to lessen its negative impact on the private production and marketing of cereals. Although housed administratively under the CNAUR, the SAP is a creation of the European Economic Community (CEE) and is currently funded by the PRMC.

Additional tension exists between the donor community and the GRM over OPAM's plan for selling security stock grain for the servicing of "undersupplied" markets. The donor's group has disapproved of this activity because they feel that in many cases the sales disrupt private sector marketing efforts. Again, this tension may result primarily from differences in criteria for triggering food assistance actions and from differences in objectives for the actions.

The resolution of this tension takes place within a joint meeting of the COC and the PRMC donors' Management Committee. Since the GRM cannot afford to finance unilaterally its emergency food distribution program, it must rely on donors. However, since no food distributions through government agencies can be made without the approval of the GRM Minister of Economics and Finance, final decisions are a result of negotiation and compromise between the donors and the GRM.

Bilateral Activities

Considerable solidarity exists among donors in attempting to insure that emergency food aid is distributed according to the recommendations of the SAP. However, fractures do occur in this solidarity with individual donors taking bilateral actions directly with the GRM outside the framework of the PRMC. This occurred recently in the 1990/91 agricultural year when it became apparent to the US government that the SAP had not been able to identify emergency food needs relating to civil instability. The GRM requested and received 4,000 t of sorghum on a bilateral basis from the US government.

In times of wide-spread famine the GRM has received massive emergency relief from individual governments as well as international, multi-lateral organizations. In 1983/84, for example, food aid to Mali amounted to 127,000 tons. The following year, 1984/85, food aid amounted to 237,000 tons.

NGO Activities

Non-governmental organizations (NGOs) are a poorly documented element of the national food security system. No one interviewed by the KSU team could provide information on the quantities of food distributed by the ensemble of NGOs working in the country. Most interviewees assumed that the level of food aid distributed by all NGOs combined is quite small or even insignificant when compared with the level distributed via governmental channels. Knowing the level of NGO food aid is important in the design of food distribution policies, the determination of food security stock size, and in any attempt to determine the impact of food aid supplied through governmental channels. Since it was reported that the only agency attempting to coordinate NGO activities, the CCA/ONG (Comité de Coordination des Actions des ONG, Non-Governmental Organizations Action Coordinating Committee), kept no records on NGO distributions (Poulton, personal communication), an attempt was made to speak with each NGO individually. Unfortunately, only a few of the agencies could be contacted during the team's visit to Mali. The following relates the information obtained.

The NGOs operate four types of food distribution programs:

- continuously operating, direct feeding programs reaching infants, pregnant women, and women nursing infants,
- food-for-work programs generally reaching food needy people during the lean season of the agricultural year (le soudure),
- free food distributions to food needy people, again usually, during the lean season, and
- food sales.

Generally speaking, NGO focus most of their activities on the first two of the above mentioned program types. Thus, the assumption that NGOs do not have much impact on cereals markets has some validity. However, in at least one case, that of the Aide de l'Eglise Norvegienne (Aid of the Norwegian Church, AEN), the scale of food distribution activities in the second two categories could have

significant impacts on prices in certain markets. The interim director of the AEN program provided information on the amount of money the program spends on the food grains it distributes through its various programs. This information is presented in the following table along with an estimate of the quantity of cereal implied. Depending on the geographical and temporal distribution, theses amounts of grain distribution could have significant, localized price effects.

Some NGO's, such as World Vision and Aide de l'Eglise Norvegienne have assisted village-level associations initiate and operate cereals banks. The purpose of cereal banks is to enhance the food security and economic welfare of their members by buying cereals at harvest and selling later as members need food or money.

In times of widespread nutritional stress, NGOs respond to pleas for assistance from local units of government. This happened in 1990/91. All NGOs visited by the KSU team, mounted free food distribution campaigns even though these types of activities are not normally part of their programs. The experience of the Stromme Commemorative Foundation of Kristiansand, Norway is an example.

The Stromme Commemorative Foundation became involved in the food aid efforts of the mid-1980s and has since mounted a development program focused primarily in Mali's First Region. However, food distribution had not been a part of its activities until local administrators called on it for food aid assistance during the 1990/91 season. The Foundation responded by providing 747 t of domestic grains to sub-regional (cercle) authorities for free distribution (Sannesmoen, personal communication). The Foundation's reasoning for delivering the food aid to cercle-level distribution committees was that "it was unwise to get too involved" in the actual distribution since this would disrupt established, community-based modes of dealing with food crises. The Foundation was impressed with the facility with which the operation was accomplished. The grain was purchased through local merchants who purchased the grain in southern Mali and delivered it to the Foundation's warehouses in targeted areas. Government-owned trucks were used (using Foundation fuel) to make the distributions from the Foundation warehouses to the cercle-level distribution committees.

An effort is being made to have NGOs assume a larger role in the village-level distribution of emergency food assistance. However, this effort has been impeded by the lack of food distribution resources of most NGOs.

Food donated by the USA (outside the framework of the PRMC) is distributed by USA-based NGOs: CARE, Africare, and World Vision. The food is generally in a processed form rather than in the whole grain form in which food distributed through governmental channels is handled. For example, during fiscal year 1992, World Vision will distribute about 2,000 t of corn/soya blend flour and vegetable oil, plus a quantity of powered milk donated by the Canadians. In contrast, World Vision distributed only 338 t of whole grain stock sorghum, donated by the USA (outside the framework of the PRMC) during 1991.

Funding the Operation of the National Food Security Stock (SNS)

Funding for the nation's emergency food delivery system is provided in its practical entirety by international donor governments and NGOs. Multi-donor,

government-level assistance is provided through the PRMC and the PSA. Practically speaking, the PSA built and maintains the national food security stock (SNS) while the PRMC replenishes the SNS after each use, pays OPAM operating costs for managing the SNS, and pays the cost of distributing the grain.

The PSA has been bilaterally funded by the Federal Republic of Germany (FRG) since 1977. The major objective and achievement of the PSA has been the constitution and maintenance of the national food security stock. In achieving this objective, the FRG has donated cereals storage warehouses capable of storing 50,000 t of cereals. It donated 39,000 t of cereals towards the constitution of the national security stock. And it has provided (to OPAM) continuous financial support, technical assistance and training in the maintenance of the warehouses and the national food security stock. The PSA was originally scheduled to end in July 1991; however, the program has been extended for three years (D.G. Agroprogress). The PSA will continue to support OPAM in the following areas:

- technical assistance related to the management of the food security stocks,
- technical and financial assistance in the rehabilitation of certain installations,
- provision of materials,
- technical assistance in staff training programs,
- assistance in the diversification of OPAM activities,
- contributions, within the framework of the PRMC and the CNAUR, to the development of a national cereals policy.

The cost of replenishing the national security stock, the cost of delivering distributed quantities to distributions points, and a portion of OPAM's operating costs are paid by the PRMC. The PRMC pays the cost of the SAP and the Market Information System (Système d'Information du Marché, SIM), which in 1990/91 amounted to US$ 1.098 million (PAM). The PRMC has been multi-laterally funded since its beginning in 1981/82. The values of donor's contributions to the PRMC over the years are shown in TABLE 2.

The Size of the National Food Security Stock

The national food security stock target size was based on the amount of grain required, in the 1970s, to provide food for urban dwellers and people in the most drought-prone areas for 3 months while emergency food was imported (Wohlers, personal communication)[1]. It was decided that 39,000 t would be needed. The rotation of the stock for purposes of quality maintenance was set at 1/3 of the

[1] Similar reasoning is reflected in the Performance Plan (Contract-Plan Transitoire Etat/OPAM) where it states that the security stock should be able to serve the emergency food needs for 4 to 6 months.

stock per year. Since that amount might be sold before the prediction of the crop shortfall could be made, 58,500 t was fixed as the target size, since 2/3 of that provided the required 39,000 t. The type of grain that can be used in the SNS is limited to millet and sorghum (GRM/MFC, 1989).

The deliberations relating to the level of the SNS took place in the mid-1970's, and the details may not be available now; however, this approach is the same as in other FAO projects at the same time. Another version of the origin of the 58,500 t level traces it to a CILSS technical assistance mission, partially financed by USAID, which visited several Sahelian nations in 1978 and suggested a methodology for determining national security stock levels.

Since the size of the target population has increased substantially since 1977, it is questionable whether the original target level provides an adequate margin of safety today. However, the early warning capabilities available now, combined with the increased level of grain reserves held by the private sector, encouraged by the credit programs established in 1986 and the increased capability of the private sector to supply effective demand for cereals, may provide the needed margin of safety.

The current, October 1991, level of the SNS was approximately 30,000 t. This reflects to some degree a consensus among donors and the GRM that the maintenance of the SNS at the target level of 58,500 is unnecessary under present Malian conditions; otherwise, the target level would have been maintained by the donors. The second Performance Contract between the State and OPAM (Contract-Plan No. 2, Etat-OPAM) covering the period 1990/91 to 1992/93 states that the reduction of the SNS is envisioned. The Contract-Plan also sets, as one of the criteria of adequate performance by OPAM, the maintenance of the SNS level below the target level of 58,500. In spite of this consensual intent to keep the level of the SNS significantly below its target level, there appear, currently, to be growing pressures to rebuild the stock to its target level during 1991/92.

Major support for the reconstitution of the SNS appears to be coming from the GRM. The present government has just taken power (in March 1991) and, in the anticipation of an excellent harvest that would normally drive down producer-level prices, would like to make some gesture of support towards the rural community. It is estimated that excess of production over total national needs will amount to between 130,000 and 150,000 t. Absorbing more than 20 percent (30,000 t) of this excess production in reconstituting the SNS will ease considerably the downward pressure on farm-level prices (Coelo, personal communication).

A second source of pressure for rebuilding the SNS comes from the PSA. The PSA plans to reconstitute the SNS to its target level during the 1991/92 agricultural year, "if the agricultural year is normal" (D.G. Agroprogress).

It is important to understand that the SNS is composed of a physical stock and a financial stock. When a decision is made to use food security stocks, a simultaneous commitment is made by the PRMC to replace the stocks withdrawn. If the commitment is to be honored by providing cash rather than grain, the money is added to the general counterpart fund managed by the PRMC secretariat. The money is not set aside in a special account for grain purchases because the counterpart fund generally contains more than enough money to reconstitute the SNS. For example, the counterpart fund balance at the current time is

approximately 5 billion CFA or enough money to import nearly 50,000 t of cereal grains from the USA. Thus, anytime the level of the physical stock is below the target level, there exist enough money in the counterpart fund to fully replenish the SNS.

In addition to the counterpart fund of the PRMC, the PSA maintains a second financial fund that can be used to purchase grain for reconstituting the SNS. The level of the security stock reserve fund on March 1, 1991 was 909,000,000 CFA (D.G. Agroprogress). The level of the security stock was approximately 26,000 t during March/April 1991, giving a difference between the actual and target levels of about 32,500 t. The cost of US sorghum delivered to OPAM warehouses in the summer of 1991 was 107,000 CFA. Thus, the security stock reserve fund on March 3 could be used to purchase 8,495 t or 26 percent of the quantity required to bring the SNS back to its target level. The planned level of the physical stock and the financial stock at the end of 1991 are 45,300 t and 1,400,000,000 CFA. At those levels the financial stock could be used to rebuild the physical stock to 58,084 t with imported grain.

The decision to replenish the stock is typically a consensual decision taken at the level of the PRMC and the GRM. However, the OPAM and the PSA have a strong influence on the decision since it is closely tied to the management of the SNS. How the management of the SNS affects this decision is further discussed below in the section dealing with the recycling of the SNS.

The important thing to remember here, in relation to the level of the SNS, is that the PRMC/PSA/OPAM SNS management group are comfortable with the notion of a fluctuating level in the SNS as long as it does not get "too low" (say, below 20,000 t) because the reserve fund can allow resupply through world market channels in an emergency. A recent purchase on the world market required about 3 months from the issuance of bids until the grain was delivered to OPAM. Realistically, this time frame could easily double in an emergency when the world market channel was fully occupied. In an emergency situation, the current food security system might respond as follows. The early warning system would alert the PRMC management group to the need for an unusually high level of food aid. The existing SNS would cover the emergency needs until the arrival of the grain purchased on the world market with the reserve fund. The additional purchased grain would probably be adequate to handle the emergency. If not, the magnitude of the emergency would have been evident early enough for additional, donated grains supplies to be called forward through international disaster relief actions.

As suggested by various persons in meetings with the KSU team, the Malian experience during the droughts of the mid-1980's and the 1990/91 crop year is evidence of the adequacy of the security reserve system. A comment heard more than once is: "[While certain other Sahelian countries] experienced hunger and suffering, Mali did not." In spite of such qualitative estimates, the success of the system in responding to food emergencies in the past is difficult to measure without data relating to the degree of hardship suffered by individuals during the recent crises. However, the level of food aid provided in recent crises provides some indication of the ability of the system to react to different degrees of emergency. TABLE 3 displays these data. Note that in some years, the amount of food aid provided is 2 to 4 times the size of the national security stock target level.

TABLE 1

Estimated AEN Cereal Distributions

Year	CFA Spent	Estimated Price	Estimated Tonnage
1991	67,597,650	50 CFA/kg	1,352
1990	57,597,650	50 CFA/kg	1,152
1989	data unavailable		
1988	167,514,000	50 CFA/kg	3,350

Source: Acting Director, AEN, personal communication.

TABLE 2

Cumulative Contributions of Donors to the PRMC

Country	Billion CFA	Million US$	Percent
EEC	5.242	18.458	22.0
USA	4.016	14.141	17.0
Canada	3.039	10.700	13.0
Netherlands	2.846	10.021	12.0
World Food Program	2.753	9.694	12.0
France	1.568	5.521	7.0
Germany	1.143	4.025	5.0
Belgium	1.097	3.863	5.0
CCCE	1.000	3.521	4.0
United Kingdom	.474	1.669	2.0
Austria	.164	.577	0.7
Switzerland	.059	.208	0.3

Source: PAM

TABLE 3

Malian Cereal Statistics

(1000 tons)

Year	Millet Sorghum etc.	Rice	Corn	Total Production	Aid Cereals
1981/82	999	135	61	1195	53
1982/83	1080	153	89	1322	83
1983/84	1147	216	144	1507	127
1984/85	901	109	101	1111	237
1985/86	1245	232	193	1670	81
1986/87	1288	236	213	1737	0
1987/88	1222	237	178	1637	26
1988/89	1691	287	214	2192	0
1989/90	1593	320	227	2140	26
1990/91 (est)	1467	375	214	2056	0

Source: Atwood, personal communication

SECTION III

UTILIZATION OF THE NATIONAL FOOD SECURITY STOCK

The Decision to Use the National Food Security Stock

The decision to use the SNS is made through a process that begins with a projected plan of food sales and free distributions that is established by the OPAM by the end of December each year. The plan for free distributions is based on information provided by the CNAUR. CNAUR relies on information furnished by the SAP, the SIM, and predicted production levels to develop its plan for food distributions. In effect, two plans are generated since the PRMC donors place more credence on the plan generated from SAP observations than they do on the CNAUR plan which considers the SAP criteria in the context of the other pieces of information at its disposal. The SAP bases its recommendations on quantitative criteria developed from observations of indicators of production, prices, ability to pay, migration, terms of trade among other criteria. The difference between these two recommendations sets the stage for negotiations between the GRM and the PRMC donors group over the final level to be distributed. This situation is discussed in more detail below.

The distribution plan identifies sub-sub-regional areas or "arrondissements" in need of food aid and specifies the quantities and timing of the food aid distributions[2]. At the level of the arrondissement, food aid destined for free distribution is turned over to local CNAUR committees for final distribution to the villages within their arrondissement. Thus, the final food distribution decisions are taken by committees at the level of the arrondissement or by village leaders who receive the food aid supplies from the arrondissement-level committees. The problems associated with this distribution procedure are discussed in more detail in the section on the history of food security stock use.

Once the SAP and CNAUR have developed their recommendations for food aid distributions, the plans are presented to the COC and the PRMC. On the donors side, the plans are initially discussed at the level of the Technical Committee which makes recommendations relating to the plans to the donor's Management Committee. The final approval of distribution plans are made at a meeting of the COC in which the PRMC donors are participants. The implementation of the annual plan is, in theory, reviewed on a quarterly basis to verify the implementation of the previous three-month's distribution and to make adjustments to the distributions planned for the following three-month period.

Obtaining final approval of the annual distribution plan entails negotiations to rationalize the CNAUR and SAP proposals. One side of the negotiations is held

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[2] Political subdivisions in Mali proceed as follows: the nation is divided into eight regions. Each region is then divided into sub-regions or "cercles," which are further divided into sub-sub-regions called "arrondissements." Each arrondissement is composed of many villages.

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by the Minister of Territorial Administration whose signature is required for OPAM to carry out the distributions. The other side of the negotiations is held by the donors' group who control the funds used for distributing the food aid and the means for replenishing the used SNS. The Security Stock Code of Operations (established by the Germans in the framework of the PSA) will not allow any release of SNS stocks without a firm commitment for their replenishment. Since the GRM currently is not willing to provide funds for the distribution of the food aid and the replenishment of the SNS, any use of SNS stocks requires the agreement of both the donors' group and the Minister of Economic and Finance.

A portion of the discrepancy between the SAP and CNAUR proposals can be explained by either a difference in criteria used to establish food need or a difference in areas covered by the two systems. Both CNAUR and SAP rely on information collected by local governmental functionnaires. The SAP, however, relies on carefully structured and detailed questionnaires regarding prices, migration, production, sales of household assets, etc. The CNAUR relies more generally on the opinion of GRM regional and local administrators about whether or not food is needed. Accordingly, it has an information network that extends down to the village level.

Local authorities at the village and arrondissement levels are under social pressure to provide for people facing hardship in their areas. In this capacity, they are likely to feel a higher demand for food aid than do members of the SAP system who generally are not responsible for the well-being of the people. Local authorities may observe isolated cases of hardship that are missed by the SAP. The CNAUR system may feel it is politically unacceptable to select individual arrondissements, villages, or individuals to receive food aid, preferring to treat all areas or persons in the area equally. This can result in a difference between the CNAUR and SAP food distribution proposals. At the time of the actual distribution this often results in the allocations destined for a portion of the population being shared equally among everyone, the needy and those not in need.

In the past, the SAP has required that more than 50 percent of the people in an arrondissement be in the "at risk" category before the arrondissement was targeted for food aid. This has caused problems when a minority of the population clearly had emergency food needs, such as, returning refugees with no food. Finally, if the SAP is not in an area, it cannot recommend food aid. This can occur in times of civil unrest. In these cases, the GRM/CNAUR will make food aid requests it is confident will be required in spite of the lack of quantitative verification of the need.

With different criteria and different capabilities for identifying food needy people, it is obvious that negotiations and compromise are called for at the national level. The following comments on this subject by the USAID/Mali Agricultural Development Office are helpful in understanding the situation:

> To oversimplify, for actions to finance SNS distributions to be taken requires a balancing between two different emphases, that of the PRMC donors group and the GRM. The primary interest of the PRMC donors group has been timely distributions following identification of areas in need, but limiting the amount of food aid to the minimum requirements, in order to avoid the perverse effects of unneeded

food aid. The primary interest of the GRM has been distribution of larger quantities for reasons which are not entirely clear, and may be largely related to the "political patronage" purposes to which food aid can be put, or may be equally related to being very cautious in wanting to respond to any possible food problem, recognizing that it's better to make errors in the direction of too much rather than too little food in the face of the possibility of severe crisis. The GRM's actions have not demonstrated strong interest in timely deliveries, but rather in increasing the quantities to be delivered...

Donors are willing to "hold out" (on financing SNS distributions) until the GRM food need request included only those areas with some technical evidence of real food need. The GRM is willing to "hold out" (on making an official request and getting the machinery moving to distribute SNS grain) until the donors agree to fund a broader food distribution than that recommended by the SAP. The result is always compromise. The distribution decision takes months longer than need be, and in addition grain may go to some people who do not need it, or some people who need grain may get less than they need, or both...

What the donors and the GRM are working towards now is a more flexible system where the GRM request includes areas not recognized as "at risk" by the SAP, but on which there is some solid grounds to request grain distribution. The SAP itself generates a lot more information than they ever make public, some of which might provide grounds for some limited food distributions in special situations. The PRMC donors group will be encouraging the SAP to make more use of its broad array of information than it has in the past. Part of the problem, though, is that the GRM grounds for grain distribution is not that people face famine or even loss of assets if they do not receive food, but rather that people face a different and somewhat less severe level of hardship, one that would not put them in the SAP "at risk" category. While this is not stated GRM policy, it appears politically unacceptable to the GRM not to request food for people facing some difficulty even if it is not a level of difficulty which would lead to famine, severe hardship, or loss of assets. And the GRM is willing to wait out the donors on this each year, just as the donors are willing to wait out the GRM on a more limited targeted distribution request (Atwood, personal communication).

The time required to achieve a consensus has been reduced considerably in the recent past as shown by the following table. The decrease in delay has, however, been at the expense of the "technical basis for food distributions being substantially watered down" (Atwood, personal communication). This situation may demonstrate a negative effect of a substantial food security stock that is as well positioned as the Malian stock. A government wanting to use the stock for political or subsidy purposes has more time to negotiate since the emergency supplies do not have to be imported.

Given the ability of the food security system (OPAM/CNAUR) to establish distributions plans for an entire year (even if they are reviewed quarterly) and given the apparent absence of a sense of urgency on the part of the GRM, and given the low per capita level of the ration which actually reaches people in the targeted area; one questions whether this is a emergency food security system or an established, welfare program.

Sales of National Security Stocks on Undersupplied Markets

Most food aid is destined for free distribution. However, in keeping with OPAM's mandate to furnish cereals in markets without adequate commercial supply, some food aid is targeted for sale in selected markets. Considerable effort has been made to enforce the notion that the sale of food aid should be done in a way that it does not interfere with the functioning of the private market, since it is the goal of the GRM to rely primarily on private sector action to insure effective food distribution. This notion was specifically addressed in the first Performance Contract with OPAM (GRM/MFC, 1989). The 1990/91 - 1992/93 Performance Contract between the GRM and the OPAM stated that OPAM's mandate to sell food in deficit areas would be reviewed since it was believed that other "more appropriate" measures could be used to solve the problem (GRM/MEF). Additional pressure to further limit OPAM's activities in this area will come from the growing private sector.

Food aid destined for sale must be sold only in deficit areas without adequate commercial supplies but which have an effective demand, i.e, the people have the money to purchase cereals; but, cereals are inadequately supplied on the local market. Food aid sales take place at OPAM warehouses located at the sub-regional level. The sales are made at prices that are set by OPAM at either the average of sub-regional-level prices reported by the SAP or, as a minimum, at prices that will cover OPAM expenses relating to the sale. The minimum quantity sold is two tons and is restricted to consumers' cooperatives or village associations.

In 1991, the maximum level of cereals allocated for sale by OPAM in markets inadequately supplied by the private sector was 6,000 t. In spite of the expressed intent of the State and the PRMC, it appears that OPAM exceeded the 6,000 t sales limit during 1991 (Coelo, personal communication). Exceeding the limit was probably related to the civil instability which occurred during the violent change of government in March 1991. One can picture the plight of an OPAM warehouse manager with a warehouse of grain in a destabilized area, facing local authorities who have historically relied on OPAM for grain supplies in routine situations and certainly in emergency situations. In such a situation, a warehouse manager might likely sell in response to local political pressure in spite of orders from the national level to the contrary.

History of Security Stock Utilization

This section is divided into two parts. The first part discusses the available, national-level data. The second part discusses village-level evaluations of the distribution of specific distributions.

Mali has experienced major food crises in 1983/84 and 1984/85. In the major crises, the national and international food security system delivered 127,000 t

in 1983/84 and 237,000 t of cereals in 1984/85. These tonnages amount to 8 and 14 percent of average estimated gross annual production of cereals over the period 1981/82 to 1990/91. Significantly, these amounts were several times the size of the national security stock target level. There are, at least, two implications that can be drawn from this experience. First, there exists a secondary, international capability which can support Mali's first line of defence against famine in extreme cases. Secondly, the level of the SNS that could have handled the extreme short-falls in production over the 1980 - 1990 decade would have been less than 20 percent of average estimated gross annual production; but, nearly four times greater than the present target level for the SNS.

The general perception among persons involved with food security program in Mali is that these food security activities "worked," demonstrating the success of the program. However, the KSU team did not obtain any quantitative data that could be used to verify the expressed opinions. It clear that the national security stock was used in the response to these crises. However, the KSU team could not obtain data that could be used to determine the level of hardship, suffering, or death that occurred or was prevented as a result of the use of the security stock.

Smaller crises occurred in 1987/88 and 1990/91. The most recent serves as an example of the successful use of the security stock. All of the food that was distributed came from the national security stock. The only delay between the recognition of the food crises and its delivery was related to factors other than the availability of the food in prepositioned locations from which it could be delivered to disaster stricken people. According to plan, commitments were made to replace the stock withdrawn from the national security stock at the time of the decision to use the stock. The replacement stock arrived before the end of the same agricultural year.

TABLE 5 provides the numerical history of recent food security stock withdrawals for emergency food actions. An analysis of the data in the table reveals that free distributions averaged about 13,000 t per year during the five-year period. These years have generally been considered fairly good crop years. Between 1982 and 1990, 82,000 t of cereals were used from the SNS--an average annual rate of use of approximately 9,000 t or about 15 percent of the target level of the SNS (D.G. Agroprogress).

A couple of food distribution evaluation missions were carried out in 1991 which shed considerable light on the distribution process at the field level where the food is finally transferred to needy people. The evaluative missions were financed by USAID and carried by the Economic Development Support Unit (Cellule d'Appui au Developpement à la Base, CADB), at that time an evaluative agency of the Ministry of Planning and International Cooperation. The CADB has since been transferred to the MAT.

Although the food aid did arrive in the proper locations in short order and in good quantity, the evaluative mission observed several types of unauthorized measures taken by the local food distribution committees which tended to distort the intended use of the food aid. The least harmless of these measures was the tendency for the local committee to ignore the recommended per capita ration

levels for targeted segments of the population in favor of an equal distribution over the whole population. This resulted in the truly needy receiving less than their intended ration. In one case, this resulted in the per capita ration being reduced from 9kg/person to 5kg/person. In other villages, the distributed ration was 3kg/person. These observations were often accompanied by the comment that although the quality of the grain was fine, the quantities allocated were insufficient.

The more insidious of the measures taken by the local distribution committees included special allocations for the members of the committee, allocations for the repair of community buildings, allocations for local "security stocks", allocations for non-existent displaced or unsettled persons and allocation based on the payment of a tax. The allocations for local "security stocks" and for "floating populations" often disappeared. The local peoples' confidence in the local food distribution committees was so low that in one case, the people placed their own padlocks on the received food grain and handled the distribution themselves. The need for close monitoring of the food distribution process is underscored by the comment of the CADB evaluator: "According to the local people, a food distribution without outside monitors or controls is a gift to the local administration" (GRM/CADB, 1991).

Recycling the National Food Security Stock

The basic objective of food security stock managers (OPAM/PSA) is to maintain the stock in good condition without incurring excessive costs. Costs can be contained by not automatically rotating the stock on the typically recommended three-year rotation. This can be done in Mali because of the mix of domestic and imported grain in the stock. Domestically produced grain has superior storage characteristics than imported grains. Thus, domestic grain can be maintained in good condition for more than three years. Imported grain, which is generally softer and therefore more infestable than local grain, has to be managed more closely and should be rotated more often than domestic grain. Accordingly, security stock managers attempt to limit the amount of imported grain in the security stock, rotating-out the imported grain in preference to domestic grain when a choice is available.

Attempting to reduce the purchase cost of the national security stock to maximize the amount of grain purchased with available funds also affects the rotation schedule. Domestic grain purchases have been limited in years of reduced harvests when domestic prices rose above some level considered reasonable by OPAM/PSA. In practice, the OPAM issues tenders for grain delivery at some specified price. In recent years, since 1988, private grain merchants have found more attractive markets for grain and have not responded, or fulfilled their responses to the OPAM tenders. In these years, the combined objective of reducing cost and limiting the quantity of imported grain in the security stock has resulted in the level of the security stock dropping below its target level by a substantial amount. TABLE 6 presents the level of the security stock over the recent past. This pattern of purchasing grain for the national food security stock tends to reduce the potential price variability that could be associated with a more rigid implementation of the rotation process. Purchases are below required levels in years of reduced harvest and relatedly higher during years of good harvest.

TABLE 4

Time Delay Between Receipt of SAP Food Aid Distribution Recommendations and Receipt of the Food by the Targeted People

	86/87	88/89	89/90	90/91
SAP Recommendations Released	Dec	Feb	Feb	Dec
GRM Request to Donors for Food Aid	May	Aug	May	Jan
Donor Response to Request	Jun	Aug	May	Jan
People Receive Food Aid	Sep-Jan	Oct-Jan	Jun-Jul	Feb

Source: Atwood, personal communication.

TABLE 5

Utilization of Security Stock

Year	Free Distribution (tons)	% of Total	Sales A	Sales B	Total
1986/87	5,501	22	20,048	(n.a.)	25,099
1987/88	32,439	63	18,951	(n.a.)	51,390
1988/89	2,816	44	2,433	1,181	6,430
1989/90	8,334	23	19,928	7,371	35,633
1990/91	16,000	68	7,500	7,500	23,500

Sales A are either a combination of intervention sales and sales on contract or intervention sales only.
Sales B are sales on contract only. Sales on contract are primarily for stock rotation purposes.

Source: OPAM

TABLE 6

National Food Security Stock Level by Months of Recent Years

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						(thousand tons)						
1985	32.8	22.1	19.2	18.2	20.0	15.9	13.5	13.6	10.6	10.6	11.8	15.4
1986	11.7	29.3	35.6	40.6	41.5	40.1	40.4	40.7	40.6	40.6	40.6	41.9
1987	42.6	42.6	42.6	40.3	43.0	45.0	50.4	50.4	50.0	50.0	50.5	49.3
1988	47.8	46.1	46.1	45.4	42.6	41.2	34.5	29.9	26.6	25.5	22.4	28.2
1989	28.2	35.7	41.0	48.1	58.2	57.9	58.2	55.9	55.4	51.8	45.2	45.8
1990	43.7	43.9	44.5	46.1	51.5	46.5	38.1	34.0	30.7	29.2	29.2	29.6
1991	30.0	27.6	28.7	24.9	22.3	20.0	21.0	25.0	23.6			

Source: OPAM

SECTION IV

FOOD SECURITY INFORMATION SYSTEM

The food security information system is a cooperative effort between the GRM and the PRMC. The PRMC provides financial and technical support, valued at US$ 1 million in 1991, for the SAP and the SIM. The GRM's contribution includes its organization, the CNAUR, charged with the management of external emergency assistance, including the SAP. The CNAUR provides a clearing house of information on food security related topics. The SAP, which is an agency of the CNAUR, provides early warning information serving as the basis for food aid distribution plans. The SIM, an agency of OPAM, collects and distributes market information, primarily price information. OPAM, of course, is the source of information on the level and location of the national security stock.

The CNAUR

The CNAUR succeeded the National Committe for Assistance to Drought Victims (Comité National d'Aides aux Victimes de la Sécheresse, CNAVS) which had the more limited responsibilities of aiding drought-stricken people. The CNAVS had no permanent secretariat, which explains the lack of published information on food aid prior to the creation of the CNAUR in 1988. The CNAUR has broader responsibilities to respond to all natural calamities (drought, floods, forest fires, etc.). Its responsibilies include the:

- approval of requests for emergency assistance to international organizations, donors, and allied nations (and the PRMC),
- promotion of short and long term activities aimed at enhancing the food security of at-risk people, and
- coordination and monitoring of assistance activities.

The CNAUR is a consultative, interministerial committee at the national, regional, sub-regional (cercle), and sub-sub-regional (arrondissement) levels. The national level committee is composed of 14 ministries and the representative of "each democratic organization" (Cellule de Prévision du CNAUR, 1988). The president of the national-level committee is the Minister of Territorial Administration (MAT)[3]. The sub-national-level committees include representatives of NGOs and are chaired by the local governmental administrator. The decree creating the CNAUR (Décret No. 101/PG-RM) provided that the CNAUR would carry out its responsibilities with the assistance of a Technical Committee composed of CNAUR and donor representatives. The permanent secretariat provided to CNAUR has the responsibilities of:

- collecting information for evaluating food assistance needs,

[3] The Ministère de l'Administration Territoriale (MAT) replaced the Ministère de l'Administration Territoriale et du Développement à la Base (MATDB) in 1991.

- preparing assistance action plans for approval by the CNAUR and the Technical Committee, and
- evaluating assistance actions.

The CNAUR divides its work among seven working groups concerned with:

- production and consumption
- livestock production
- cereal storage conditions and levels
- logistics and transport
- health and nutrition
- early warning system (SAP)
- migration.

At present, the activities of the CNAUR appear to be concentrated on developing free food aid distribution plans using information provided to it by the SAP and that forwarded to it by CNAUR committees located throughout the nation. The CNAUR also collects and assembles information on a wide range of topics relating to food security. The information closely parallels the concerns of CNAUR's seven working groups. These data are published in an annual report, (Rapport de Campagne 1988/89). The KSU team was able to obtain only the 1988/89 issue.

The Market Information System (SIM)

The SIM relies primarily on the agents of OPAM located in OPAM branch offices across the nation to accumulate millet, sorghum, corn and rice price quotations from merchants on farmer/merchant transactions and merchant/consumer transactions. Qualitative evaluations of the quantities of the commodities on the market are also collected. The OPAM agents remain in place from the days before 1988 when OPAM's buying and selling transactions (for price stabilization and commercialization activities) were much greater than they are currently. Prices and quantity evaluations are collected once a week on approximately 85 markets. Markets covered include:

- 12 consumer markets in the capital city of Bamako,
- 21 consumer markets located throughout the nation,
- 36 producer markets for millet, sorghum, and corn, and
- 16 producer markets for various forms of rice (SIM, 1991).

The weekly averages are reported on radio and television programs and published in a weekly report. The average of the four weekly averages for a given month constitute the monthly average prices. Selected prices are reported in a semi-

annual report which includes graphs of price movements, explanations of the data, and comments on probable causes of the price movements.

The SIM has two sources of technical support:

- a Malian economist funded by the PRMC and
- a Michigan State University agricultural economist funded by USAID.

The Early Warning System (SAP)

The identification of nutritionally distressed people and the quantification of their needs has become the responsibility of an early warning system, the Système d'Alerte Précoce (SAP). The SAP is housed administratively within the CNAUR but is financed by international donors through the PRMC.

The SAP began operations in Mali in May 1986 and is funded by the European Development Fund, Fonds Européen de Développement (FED). Technical assistance for the SAP is provided by the European Association for Health and Development, l'Association Européen pour le Développement et la Santé (AEDES). The SAP team includes 26 persons, 13 at the Bamako headquarters, 7 regional representatives (2 in Mopti), 6 drivers. The primary source of information comes from questionnaires completed by arrondissement-level CNAUR committees (Schmedts, personal communication).

Highly trained Europeans manage the system and hope to develop mathematical models, based on the accumulating data base, that can be used by less insensitively-trained Malians to predict when and where food emergencies will occur. For the present, the information collected by the SAP includes quantitative data and qualitative observations relating to basic food prices, the condition of major crops, rainfall, food availabilities, population movements, and nutritional status of the population. These observations are compared to norms established for each geographical area and recommendations for food assistance are based on the degree of variation from the norm.

The information is collected in three "phases." The first two phases monitor crop conditions and socio-economic factors. If conditions indicate the beginning of a crisis, the third phase is employed. Actually, the third phase is split into two surveys:

- a socio-economic survey of village chiefs and
- a medical/nutritional survey of families.

The information is used by SAP to make recommendations to the CNAUR relating to areas (arrondissements) in need of food aid, the quantities to be distributed and the time period during which the distributions are to take place. The food distribution recommendations cover a full year. However, since the SAP is a continuously operating information collection system, it is continuously aware of the conditions of the people and their crops. Thus, specific food emergencies are identified as they develop. This information is used by the CNAUR food aid program managers to alter food assistance programs during the year.

Lead time for predicting the eventual size of food distributions needed in each arrondissement varies according to the arrondissement because of the difference in economic activities. However, SAP estimates that in most years a definitive estimate of food needs is available three months before the need becomes acute (in the "soudure").

The Early Warning System (FEWS)

The USAID financed Famine Early Warning System (FEWS) has been operational in Mali since 1986. The FEWS representative in Mali gathers information from Malian data collection services, including the Ministry of Agriculture's Office of Agricultural Statistics, the SAP and the SIM. FEWS also develops information relating to vegetative biomass and rainfall from data collected by satellite. FEWS compiles and publishes this information at ten day intervals in a bulletin which discusses the information and its implications for the proximate harvest and for livestock production.

SECTION V

l'OFFICE DES PRODUITS AGRICOLES DU MALI

The Agricultural Products Marketing Board of Mali (Office des Produits Agricoles du Mali, OPAM) is the governmental organization with responsibility for managing the national food security stock. The legal character and mission of this organization has evolved considerably over the years. Created in 1965 (Law No. 65-7/AN-RM, March 13, 1965) as a parastatal organization with a monopoly on the marketing of cereals in Mali, its legal monopoly was rescinded by a 1982 law (Law No. 82-36/AN-RM, March 20, 1982). Note that this change coincides roughly with the beginning of the PRMC and the beginning of World Bank structural adjustment programs. The character of OPAM was also changed with the 1982 law to that of a self-financing, state-owned, commercial entity (Etablissement Public à caractère industriel et commercial, EPIC) without a regularly appropriated operating budget from the State. OPAM no longer could rely on the State to finance its operating deficits. To a large extent, this void was filled by PRMC.

Under the 1982 law, OPAM was charged with supplying cereals to deficit areas and to various public agencies, such as the army, security forces, hospitals, schools and penitentiaries. This probably explains why many public sector agencies and employees continue to expect and sometimes demand this service from OPAM in spite of the fact that OPAM's mandate no longer includes this function. Under the 1982 law, OPAM was also charged with supporting administered prices for producers and consumers, as well as maintaining a national security stock. An attempt to support producer prices above the market level in the 1985/86 crop year lead OPAM to exhaust its purchasing budget and fill its warehouses to capacity (134,000 t). The following harvest of 1986/87 was also quite good, so OPAM could not sell much of its grain at the higher-than-market prices it required to recover its costs. Thus, OPAM's budgetary situation worsened and may have contributed to the following event.

In December 1987, the mission of the OPAM was again cut substantially, removing its important responsibilities to supply government agencies with cereals, and to control producer and consumer prices. OPAM's mission was reduced to maintaining the "security of the market" (Coelo, 1990). These changes were spelled out in the first Performance Contract (Contract-Plan transitoire Etat/OPAM) governing OPAM's activities during the period 1988/89-89/90 (GRM/MFC, 1989). A second Performance Contract (Contract-Plan No. 2 Etat/OPAM) with similar provisions covers the period 1990-91/1992-93 (GRM/MEF, 1991). In carrying out its role, OPAM was instructed to confine itself exclusively to:

Three primary missions:

- to manage the national security stock (Stock National de Sécurité, SNS),
- to manage food aid,
- to supply deficit areas with food,

Two secondary missions:

- to manage the national market information system (Système d'Information du Marché, SIM),

- to operate the OPAM training and documentation center (CEFODOC)

Four complementary activities:

- to supply stored grain treatment services to other organizations on a total cost reimbursable basis,

- to rent-out for grain storage its available warehouses,

- to rent-out its available trucks or provide delivery services for food aid,

- to sell grain sacks received by OPAM as donations or imported for resale.

Accompanying the order to reduce its sphere of activity, OPAM was also ordered to drastically reduce its staff. OPAM's staff level was to be reduced by 50 percent during the transitional Performance Contract. The level was further reduced under the second Performance Contract. By 1991, OPAM's staff level had been reduced from 741 in 1987 to 286. The morale, competence, and salaries of the remaining staff is considered much higher than at the higher staffing level. It is probably no coincidence that these drastic measures occurred about the time the GRM began negotiations with the International Monetary Fund for a Standby Agreement and Structural Adjustment Facility.

OPAM'S Role

As a result of these drastic changes, OPAM has been reduced from the most important player in the cereals market to little more than a storekeeper struggling to find some dynamic role to play in a new economic environment. It will have difficulty marketing its technical services to its old foe and new rival, the private sector. Its only remaining areas of relatively free and influential action are in selling security stocks on undersupplied markets or for stock rotation purposes. As mentioned above, the first of these actions is currently under review. The second may provide it with some patronage for redistribution since it is predictable that, during this year of predictable purchases to rebuild the national security stock, OPAM will have to pay a premium for the cereals it buys.

OPAM also retains its two secondary missions and its four complementary functions. OPAM does not appear to have a clear vision of itself as a major center for grain storage and marketing training and consulting; although this certainly could be developed, based on its present staff and regional reputation. OPAM also is responsible for the SIM which is discussed under the section dealing with the food security information system.

OPAM is allowed to rent-out the warehouses it is not using for holding the national food security stock. In 1988, OPAM had rentable excess storage space for 42,185 t of cereals (Cellule de Prévision du CNAUR, 1988).

OPAM's Structure and Storage Capacity

OPAM has three divisions and sub-divisions under the office of the assistant director (Directeur General Adjoint). These include the Division of Food Security, whose functions are stock management, pest control, and market information (SIM); the division of Finances, Accounting and Computer Operations; and the Division of Administration and Personnel, which handles general administration and personnel functions, the center for training and documentation, and maintenance of buildings and equipment. Attached to the OPAM director's office is the Inspectorate General with its audit team and monitoring team. Also answering directly to the director's office are international technical assistance projects including the PSA, an FAO training project, and a pest control project.

OPAM's cereal storage warehouses have a combined capacity of 132,000 t (D. O. Agroprogress). Because OPAM's role in the cereals market has been reduced, some warehouses are now being leased to private traders and other agencies. There is agreement that OPAM has more than adequate capacity to house the 58,000 t security stock.

Warehouses used for national security stock are located as follows:

Bamako	10,000 t
Gao	5,000 t
Kayes	6,000 t
Kita	2,000 t
Koutiala	3,000 t
Mopti	10,000 t
Segou	17,500 t
Toumbouctu	4,500 t

These warehouses are brick and concrete or block and concrete structures with steel superstructure and roofs. All were constructed between 1975 and 1985, and a rehabilitation program was recently completed. All reports (and the observations of this team) indicate that the national security stock is stored in good structures.

Staff Training

Since 1974 OPAM has received technical support from a FAO-sponsored program that was taken over by the Federal Republic of Germany in 1977. Between 1977 and 1987 this Program of Food Security (PSA) was financed and administered through a ministry-level bilateral agreement under which the Germans were, in essence, the day-to-day managers of the security stock. The current project is more oriented toward support and less toward direct administration of OPAM activities, but the GTZ, on behalf of the sponsor, maintains administrative control of the movement of national security stock grain. One result of this long association is that many OPAM people have received training. Several training programs have been

presented in-country over the years, some by the German technical advisors, others by FAO-sponsored specialists from the British development organization, currently called the Natural Resources Institute (NRI).

Because OPAM has a very low employee turnover rate, much of this investment in training has remained with the organization. The average seniority of the Quality Control Unit employees is estimated to be about 10 years, and that of people in other areas, slightly less. Eight of the current OPAM staff have received short-term training in NRI and two attended the Grain Storage and Marketing Short Course at KSU. A senior member of the quality control unit is performing research in Mali for his Ph.D. at the University of Reading, England. Warehouse managers and the commercial agents who manage outlying depots have all received training in-country. Even people from surrounding countries train at SOCODEF, a center developed within OPAM by donors and utilized by the GTZ technical support team for training in post-harvest subjects.

Pest Control and its Effectiveness

The administrative mechanisms developed within OPAM to assure quality maintenance are impressive because of their multitude and redundancy. They are not, however, streamlined and therefore are said to work slowly, and to successfully diffuse responsibility. In addition to the commercial manager, who oversees the entire operation, each of the 8 depots where security stock is held has at least one warehouse manager. The manager is responsible for the physical handling of the grain within the warehouse, the housekeeping, and routine warehouse inspections.

According to OPAM personnel, the warehouse inspection procedure is currently being altered. Checklist-style formulae similar to what FFGI recommends will now be used for the bi-monthly warehouse inspections. Super-inspections are done every three months by central Quality Control inspectors, and once a year the QC inspector's supervisor accompanies him on the super-inspection visits. When the inspection form indicates a problem that warrants treatment, a treatment team is dispatched. The are five such teams of one to three persons each located in different zones of the country, so that the team is never extremely distant from the infested warehouse. Adequate documentation of the treatment is required, and the subsequent routine inspections should provide information relative to the effectiveness of the treatment. Good documentation of the amount and location of pesticides are kept.

On paper the system appears good enough for a Pillsbury plant in St. Louis or a Conagra facility in Des Moines. However, the "request for treatment" form must pass through 14 separate steps and be approved by a variety of officials in various parts of the country. As a result, the organization is said to take weeks or months to respond to pest control problems.

Another administrative mechanism designed to assure integrity in the system is the yearly physical inventory, accomplished to verify record-keeping and identify loss of product. Recovery of spilled grain and grain in damaged bags also requires verification by a team of OPAM officials from outside the depot administration. This undoubtedly reduces petty theft but also hinders timely housekeeping because of the delay involved in requesting and receiving the visit.

The security at the emergency reserve warehouse complexes appeared to be excellent.

The KSU team observed security reserve warehouses in Bamako and Segou. Jointly, these sites represent nearly half of the national capacity for security stock. Housekeeping was not exceptional, but adequate. This inspection detected no insects flying in, or crawling on surfaces in the warehouses. The warehouses were solid, rodent-proof structures well suited for storage in the tropics. Ventilation openings had screens in addition to security bars, roofs had adequate skylights, and doors closed tightly. The warehouses were well maintained.

In addition to the inspection and housekeeping components of the pest control package used by OPAM, chemical methods appear to be applied as per most recommendations. According to OPAM people, contact insecticides are applied to floor and wall surfaces as a warehouse is prepared to receive grain. All grain is fumigated when it is received into the system. Stack surfaces then receive a coat of residual insecticide. To avoid introducing infestation, warehouses for security stock are not used for other types of product (programmed aid, etc.).

Pesticides, pesticide application equipment, safety equipment, tarpaulins, and sand snakes all appeared adequate for the conditions. (These items are donated by the German project).

The most objective and direct measure of the ability of an organization to maintain grain quality for the required two years is given by an examination of the quality of grain which has been stored in the system for two years. The 1989 sorghum examined in Bamako was in good condition. The two-year-old millet had been damaged slightly by infestation, but the insects had been killed. Although it contained a few flour beetles and lesser grain borers in parts of the stack at the time of the visit, the condition of the grain was on a par with that seen in the local market.

Both sorghum and millet were also observed in Segou. Both were at least two years old. The sorghum had been infested but was not badly damaged. The millett had been badly infested in parts of the 500 t stack. Trogoderma, lesser grain borers, and flour beetles had been allowed to develop very large populations before the stack was successfully fumigated. Significant damage had been done to small amounts of the total mass. Although the loss and damage was not disastrous, the incident emphasizes that although OPAM has all the knowledge, equipment, and technical support necessary to avoid this type of problem, it sometimes does not get the job done.

Pest control people blamed the sluggish bureaucracy and lack of interest by administration for not allowing the fumigation to take place in a timely manner. Undoubted administration has others to blame. Due in large part to the redundancy built into inspection and reporting systems, the basic problem was solved - however slowly. In general, OPAM has adequately performed quality maintenance and proved they can successfully maintain the quality of security stock grain.

It should be noted that the grain we observed was locally-purchased sorghum and millet. At the time of the visit over half of the security stock was comprised

of U. S. sorghum, though this had been in OPAM warehouses only a short time. OPAM and GTZ people both indicated that they preferred not to have donor-country grain in the national security stock because it was more difficult to keep. This is undoubtedly true, since the local grain is smaller, harder, and dryer - and therefore less infestable - than the U. S. sorghum.

Cost of Quality Maintenance

The costs related to the maintenance of the security reserve are currently not separated from other costs in OPAM's operating budget. Therefore, PSA personnel were asked to estimate these costs. Their estimate was 15,000 - 18,000 CFA/t/yr (56 - 67 USD/t/yr). A 1991 assessment of OPAM finances (Gestion Informatique Developpement, Inc.) calculates the cost of chemical treatments alone at 2.55 USD/t/yr. The contact insecticides used (Actellic and Fenitrothion) are valued at 13.00 USD/l and the phosphine fumigant at 18.3 cents USD/tablet in-country, many times the U. S. price. The Federal Republic of Germany has provided approximately 22 billion CFA (77 million US dollars) since 1977 to implement the project.

SECTION VI

DONORS SUPPORTING THE FOOD SECURITY PROGRAM

As pointed out above, the donors supporting the food security program on a continuous basis are the PRMC donors' group. TABLE 2 shows the level of their support for the PRMC since its beginnings. As shown in that table, over 75 percent of the support for the PRMC comes from five donors: the EEC, the USA, Canada, the Netherlands, and the World Food Program (which clearly includes food from many nations). As mentioned above the FRG has made a considerable contribution through the PSA.

SECTION VII

IMPACTS OF STOCK MANAGEMENT POLICIES

The impacts of stock management practices can be considered to result from either use of the security stock to address food emergencies or from the rotation or replenishment of the stock. The use of security stock to address food emergencies is designed to have very specific or localized impacts. The obvious beneficial impacts are that food-stressed people receive food. The negative impacts are that solutions to the causes of the food stress are not encouraged.

A parallel can be drawn to federal disaster assistance in the USA. People who build their homes in flood-prone areas often have difficulty affording private sector flood insurance--the cost is high because the risk of flooding is high. As a result, many of these people have inadequate insurance coverage. Often when the floods occur, the federal government declares the area a disaster and rebuilds the destroyed homes at taxpayer expense. But the flooding problem is not solved and the stage is set for another disaster. This author's relatives who have had their fishing camp rebuilt three times with federal disaster assistance. Thus, even though the short-term intentions of disaster relief are irreproachable, the longer-term impacts may be less than desired.

Similarly, the provision of food aid, without additional programs to address the underlying causes of the food emergencies, may simply prolong a disaster-prone situation. In Mali, the provision of food aid to structurally deficient areas has the negative impact of not encouraging private-sector-based responses to the situation. Producers and marketers are not encouraged to supply markets that can be reached only at high cost if there is a strong possibility that they will have to compete with government or private relief agencies who will supply the market at subsidized rates.

The sale and purchase of cereal stocks for the purpose of rotating or replenishing the national security stock tends to have broader based impacts since these operations occur through a national-level market that is relatively well integrated. Being integrated implies that the market communicates and responds quickly to changes in supply or demand occurring anywhere within the market. Thus, if the stock managers decide to purchase grain supplies, this information is quickly communicated throughout the market and a response is stimulated. As mentioned above in the section entitled "The Size of The National Food Security Stock," the present practice of replenishing the stock tends to minimize the negative impacts of the process. Rather than automatically replenishing the stock as soon as possible after use, the present practice is to delay the replenishment until a time when the purchases will not have a large negative effect on either producers or consumers.

Quantifying the impacts of Malian food security stock management on producers' and consumers' welfare can only be addressed in roughly approximated terms, given the author's access to necessary data. Ideally, an economist would appeal to a calculation of consumers' and producers' surplus for a mathematical quantification of changes in producers' and consumers' welfare that result from security stock management practices. On a national basis, this calculation would require

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mathematical estimates of the annual supply and demand functions relating prices and quantities of cereals purchased and sold on a idealized, national market. Not having estimates of these functions, we can attempt to gain some notion of the magnitude of possible impacts through a trial calculation of expected monetary impacts on consumers' and producers' expenditures. The results will be very tentative and only indicative.

In order to make even these rough calculations, we need to make some estimates of the quantities of cereals marketed in a given year and the impact a change in the quantity marketed would have on prices. If the change in quantity were due to actions taken by the managers of the security stock, the impact on producers or consumers could be attributed to the stock management practices. As an example, let's take a situation in a poor harvest year when prices would normally rise above the long-term average trend in prices as a result of reduced quantities offered for sale. Assume that the stock managers sell quantities of cereals from the security stock, thereby, replacing the short-fall in production. Under this scenario, domestic production and production costs would be unaffected since the introduction of security stock quantities would occur after the domestic crop is harvested. Thus, the introduction would only affect producers' incomes and consumers' prices. Average prices for the year would tend to rise less than they would have in the absence of the sales by the security stock authorities. Consumers would benefit from the lower-than-expected increases in prices while producers would lose. By how much?

We have some estimates of annual total production of cereals in Mali. From Table 3, a 10-year average (1981/82 - 1990/91) annual production of approximately 1,660,000 tons can be calculated. Average annual free distributions of cereals from the security stock have amounted to 13,000 tons in recent years (Table 5). Total average utilization from the security stock (including those distributions that were sold) amounts to approximately 28,000 tons (Table 5). Thus, the average free distributions amount to less than one percent of average production, while total distributions have amounted to approximately 1.7 percent of average production.

Demand for a basic food commodity is expected to be relatively unresponsive to changes in prices (inelastic demand) since most consumers will not greatly increase their purchases beyond what they normally buy even if prices are relatively low. This is the usual case because the consumers do not have any use for the grain other than immediate consumption. On the other hand such consumers can be expected to be willing to pay relatively high prices to obtain their minimum needs. Thus, in a market characterized by an inelastic demand, it is expected that a small change in quantities supplied with cause a relative large change in the prices at which the commodity will be traded. A demand situation in which a 1 percent change in quantity causes a 5 percent change in prices is not uncommon for basic food commodities.

Using these figures, it is not unreasonable to estimate that distributions from Mali's food security stock could cause average prices to change by 5-10 percent in a year when production approached the 10-year average.

Consumers and producers gain or lose from a given price change in opposite directions. For example, consumers gain while producers lose from a price

decrease. These gains and losses sum to zero for those producers who consume their own production; thus, net gains or loses only occur in relation to that portion of the crop that is marketed--about 15-20 percent of the crop in subsistence societies. In Mali, 20 percent of the 10-year average production would amount to 332,000 tons. At 60,000 CFA per ton, this marketed portion of the annual crop would be worth approximately 20 billion CFA. Applying the 5 to 10 percent change in prices that could be expected to result from "average" food security stock distributions to this value implies that producers and consumers would gain or lose 1 to 2 billion CFA ($400,000 to $800,000) as a result of security stock distributions used to adjust for a production shortfall.

To gain some notion of what impact $400,000 to $800,000 would have on producers, one could distribute the sums over some estimate of the population of producers and calculate the implied percent change in individual income. We emphasize that caution must be used in using these figures since the results can vary widely depending on the assumptions used in the calculations. It is advisable to make several calculations using different assumptions to get an idea of how much the results are affected (conduct a sensitivity analysis).

Let's assume that the population of Mali is 8 million people and that 50 percent of these people are producers or members of producers' families. Distributed evenly among producers, the $800,000 loss in revenue would amount to a $.002 or .50 CFA change in per capita income--not a very impressive level of change. However, depending on producers' alternative uses for their resources such a level of change could be effective in stimulating decreased production from producers as a group. With all other things being equal, one would expect a negative response. However, given the production shortfall situation in which producers had already produced their crop and the injection of food security stocks merely replaced unanticipated losses, it is possible that, on average, producers received their expected price. In this case, the injection of food security stocks might not have a negative impact on future planting plans. It follows that if stock management practices are designed to minimize negative price impacts, they could provide a neutral or positive stimulus to producers. This appears to be the desired outcome in Mali.

The benefits of food distribution are not evenly shared across the population but rather concentrated, having localized impacts as food security stocks are distributed in areas experiencing nutritional stress. Certainly, the freely distributed food has localized positive impacts at least equal to the commercial value of the food. Assuming a price of 60 CFA per kilo, the 13,000 ton average distribution would be worth 780,000,000 CFA or $3,120,000. If the 13,000 tons were distributed to provide 3 months of cereals requirements for as many persons as possible, approximately 350,000 persons could be provided with 12.5 kilos per month for the three months. At 60 CFA per kilo, this food aid would be worth at least 2,250 CFA or $9.00 per individual. This value would be equal to approximately 4 percent of the national per capita income (estimated in 1988 to be $230). However, for given individuals, these small quantities could have significantly greater values in a short-term struggle for survival.

SECTION VIII

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APPENDIX 1

CHRONOLOGY OF EVENTS RELATED TO FOOD SECURITY

1959	Creation of Office of Cereals
1964	The Office of Cereals, Fruits, and Vegetables succeeds the Office of Cereals
1965	The Office of Cereals, Fruits, and Vegetables is replaced by the Malian Office of Agricultural Products (OPAM), Law No. 65-7/AN-RM
1974/75	Food Security Project (PSA) financed by Germany begins
1981	Liberalization of the cereals market. Abrogation of OPAM's cereal market monopoly
March 1982	OPAM recreated as a self-financing, state-owned, commercial entity (EPIC). Law No. 82-36/AN-RM abrogated and replaced Law No. 65-7/AN-RM
November 1986	GRM encourages credit to private traders
November 1986	Liberalization of paddy rice purchase
October 1987	GRM approval of PRMC donors joint proposals for cereals market reform
November 1987	Abolition of grain subsidies
November 1987	Abolition of officially set grain prices
December 1987	Announcement of strict limits on OPAM's role (limited to managing security stock and food aid and distribution in food deficit areas)
1987	Last planned food security stock warehouse is completed by PSA
December 1988	Law No. 88-67/AN-RM of December 26, 1988 officially limited OPAM's mission to managing security stock and food aid and distribution in food deficit areas
May 1988	Announcement of OPAM restructuring plan (major cost and staff reductions)
October 1988	GRM approval of OPAM restructuring plan
November 1988	Major GRM program of credit to private traders in place
January 1989	OPAM restructuring completed with 50% reduction in staff

CHRONOLOGY OF EVENTS RELATED TO FOOD SECURITY (cont.)

February 1988	GRM approval of OPAM transitional performance plan setting out implementation benchmarks
March 1989	Transitional performance plan approved by council of ministers
January 1991	Second Performance Contract between GRM and OPAM covering the period 1990/91 - 1992/93 is signed.

APPENDIX 2

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ZAMBIA FOOD SECURITY PROGRAM CASE STUDY

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ACRONYMS

BID	InterAmerica Development Bank
DCU	District Cooperative Unit
CFB	Commercial Farmers Bureau
CFEWU	Crop Forecasting Early Warning Unit
DCU	District Cooperative Union
EWCC	Early Warning Coordination Committee
EWS	Early Warning System
FAO	Food and Agricultural Organization of the United Nations
GRZ	Government of the Republic of Zambia
NAMBOARD	National Agricultural Marketing Board
NMC	National Milling Company
NCEW	National Committee on Early Warning
PCU	Provincial Cooperative Union
SADCC	Southern Africa Development Coordinating Council
ZCF	Zambia Cooperative Federation

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SECTION I

FOOD SECURITY POLICY

Successive governments in Zambia before and since independence have considered it prudent to maintain reserve stocks of the staple food, maize. The Government of the Republic of Zambia (GRZ) has tried to maintain a strategic maize reserve to ensure that sufficient stocks are always available to cover a seasonal production shortfall. A shortfall may take place because of adverse weather conditions, low plantings of maize by farmers, and/or monocropping of cash crops (notably hybrid maize), and to permit the GRZ to cover special distribution requirements to vulnerable groups in drought-prone areas during years of crop failure (Hudson, personal communication, 1991; CFB, 1991).

The production component of the maize subsector is currently making a substantial contribution to urban food security but its contribution to rural food security seems to be somewhat less. However, the contribution being made to urban food security by the maize production system is masked by the substantial inefficiencies which exist in maize marketing and the relatively large marketing and consumer subsidies which are in place.

In rural areas, many problems of food security exist even though maize production has expanded greatly. The problem of seasonal food shortages may be linked to problems in maize production in years of poor rainfall (or floods) and linked to characteristics of the marketing system wherein small-scale producers have substantial incentives to sell maize before the rains come, thereby leaving too little maize in rural storage for use later in the year. Food shortages in Zambia, generally, do not affect a large population nor extensive areas. The effects of drought and floods are generally limited to relatively isolated pockets of the country and vary considerably at provincial as well as district and ward levels (Banda, 1989). For example, the Southern and Western Provinces are more prone to drought than other areas of Zambia (McKenzie, 1991). Some areas are regularly affected by floods such as Mpika District (Northern Province), Lundazi and Chama Districts (Eastern Province). When pest infestations like the cassava mealy-bug which affected some parts of the northern high rainfall areas in the 1986/87 production season are coupled with a flood or a drought the same year, the disaster can reach very significant proportions.

The problem of continuing food unavailability of low income rural households may be partially addressed by expanding maize area and yields among these households, although cash and labor constraints may exist (GRZ, 1990).

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SECTION II

CONTROL OF THE NATIONAL FOOD SECURITY STOCK

Government Structures

Until 1989, NAMBOARD was the government's main instrument for maize marketing. The National Agricultural Marketing Act of 1969 established NAMBOARD as a parastatal entity. NAMBOARD replaced two entities, the Grain Marketing Board and the Agricultural Rural Marketing Board that had been created in 1964 at independence. The two previous marketing boards served farmers along the line of rail and farmers in remote areas, respectively (McKenzie and Chenoweth, 1991). The two boards were vestiges of a colonial system set up in the early 1930s when maize production in Northern Rhodesia became in excess of local demand, and the colonial government intervened to secure a proportion of the internal market for European growers (Takavarasha, 1990).

In 1969 NAMBOARD was formed to ensure that all producers would receive the same treatment whether they were on the line-of-rail or in outlying areas. Developmental rather than economic considerations were the government's primary motive in establishing parastatals; by using boards as instruments for agricultural development (Takavarasha, 1990).

NAMBOARD initially was given a number of responsibilities and functions including a monopoly on the purchase, sale, import, export, and storage of maize on a countrywide scale. The board established more than one thousand market points, relying on a core structure of fifty-two major depots. The organization was controlled from a head office in Lusaka and operated through nine provincial and 43 district managers. Since its establishment, NAMBOARD was ineffective in carrying out the broad marketing functions bestowed on it at the time of its formation (Wood, et.al., 1987). NAMBOARD was beset with a number of problems including inadequate definition of its responsibilities, inadequate number of skilled staff to handle its many activities, inadequate cost accounting, and assorted logistical problems (McKenzie and Chenoweth, 1991).

By the late 1970s, Zambian policymakers were disappointed with the performance of NAMBOARD and, encouraged by Scandinavian donors, began to consider provincial cooperative marketing unions (PCUs) as alternative marketing organizations for servicing the whole of Zambia. By 1981 new PCUs were established in the six provinces that did not already have them, and a Ministry of Cooperatives was also created. Interprovincial trade remained the responsibility of NAMBOARD. The PCUs, however, experienced the same problems faced by NAMBOARD and a range of other problems. As a result, the government decided, in January 1985, that NAMBOARD should resume responsibility for the sale and distribution of maize and fertilizer (Wood, et.al., 1987). Problems at NAMBOARD continued to mount, and, in 1989, the GRZ decided to dissolve NAMBOARD.

When NAMBOARD was dissolved, the off-farm maize storage function that used to be handled by NAMBOARD was transferred to the Cooperatives along with major storage facilities. All of these facilities have been constructed by government or donors and then made available for use by the official marketing agency. Ownership of

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the storage facilities still remains with the GRZ though any large-scale maize-holder has the right to use these facilities. The Zambian Cooperative Federation (ZCF), although given the responsibility for the maintenance of these facilities, is currently discontinuing this service since it receives no revenue for this service from the PCUs and the mills (McKenzie and Chenoweth, 1991).

In 1989, the ZCF took over NAMBOARD's functions and is currently responsible for the maize reserve, the importing and exporting of grain, and the interprovincial marketing of maize. The interprovincial movement of maize and the maize reserve are subsidized by the GRZ (McKenzie and Chenoweth, 1991).

Funding the Operation of the National Food Security Stock

In 1990, a tentative budget for the national maize reserve for 1991 was calculated based on the cost of maize purchased (K284/bag), transport, and maintenance cost of the reserve. The total cost of purchasing, transporting, and maintaining the maize reserve was initially estimated at K1707 million. Because inflation that year was approximately 100 percent, the cost of maize purchased was increased during the crop year from K284 to K500 and finally to K800/bag. The revised costs pushed the cost of purchasing 2.5 million bags of maize up to 2 billion Kwachas.

In early 1991, funds totalling 1 billion Kwacha were allocated to the ZCF to purchase 2.5 million bags for the maize Reserve. Within a few months after receiving the funds, about one billion Kwacha was spent transporting maize to ZCF storage, and then to the mills. None of the maize was kept for Reserve. The costs of transport were charged to the maize marketing budget for 1991. The maize purchase funds should have been recovered from ZCF when the Reserve maize was sold but they have now been diverted to fund maize purchases for the 1992 season. The revenue from having sold the maize to the mills was used to pay the Cooperative Unions for the maize and to pay for additional transport subsidies in order for the GRZ to move maize from remote locations (McKenzie and Chenoweth, 1991).

It is the consensus among many who work for ZCF, GRZ, and CFB, that before funding for the national food security stock is provided, an organization that has no chance for commercially using the stocks at the risk of not having security stocks be substituted for ZCF to manage the maize reserve (Chabala, 1991; McKenzie, 1991; CFB, 1991). Managing national security (in this case, managing food security stocks) is the function of the government, and, as such, should be within its jurisdiction. Once the government organization is set up to manage the security stock, the funding for the security stocks should be well established in the government budget (or through a long-term agreement with donors for donor funding) at a monetary level that coincides with the projected annual costs for the targeted security stock. The government budget should be based on purchasing and maintaining the security stock at its target level not at some historical average level of the security stock. Security stock levels are expected to fluctuate during the year due to circumstances that call for the release and acquisition of stocks.

Whatever security stock size the GRZ plans to target will be expensive on a per bag basis. It is calculated that a maize reserve of 2 million bags would have

cost the government over 2 billion Kwacha (in just transport and finance costs) in 1991. That assumes that the maize is transported from Provinces located near the rail line and not from the Eastern and Northern Provinces (where transport costs would be about double). If other costs, including fumigants, salaries, utilities, maintenance, repairs, and depreciation are included, it would be reasonable to expect the total cost of the maize security stock to be about USD162/metric ton (or about 1200 Kwacha per 90-kg bag or over USD14.55/90-kg bag at K82.50/USD).

The Size of the National Food Security Stock

The target level for the national food security stock was established a number of years ago at 2.5 million 90-kg bags (225,000 metric tons) of maize (FAO, 1990). This magnitude of the maize reserve was apparently decided to be the temporary reserve required based on an import displacement period of about three months. The figure of 2.5 million bags of maize currently represents less than three months supply to urban centers. The funding provided by the GRZ for purchasing and maintaining 2.5 million bags of maize has not been sufficient and with the new Government in power various recommendations on modifying the size of the maize reserve have been proposed or formulated.

Basis for Size Recommendations. The recommendations for the size of the national food security stock have been based on a number of crucial factors, including

(1) The import displacement period or the time it takes imported maize to arrive to the stock managing organization's warehouse in Zambia. At the time of this case study, Zambia was importing white maize from South Africa. The first train shipment of 30,000 metric tons of maize had arrived approximately two months since the decision to import maize was made. Within a period of five months, the entire import quantity of 150,000 metric tons is expected to have reached Zambia.

(2) The early warning capability within Zambia for forecasting a stock shortfall. In recent years, Zambia has always had sufficient domestic maize stocks available in the country through at least the month of December. By October each year, the CFEWS in Zambia is able to determine the commercial maize stock level and accurately project how long those stocks will last.

Whether Zambia imports white maize from South Africa or Zimbabwe, the two most active maize exporting countries in SADCC, the early warning in October will, even under the worst case scenario, allow sufficient time to import maize before stock-out occurs. Which means that no emergency stocks would be needed in Zambia if there was always the chance of obtaining white maize on a timely basis from South Africa or Zimbabwe. Recent experience has shown that neither Zimbabwe nor South Africa are always reliable sources (CFB, 1991). In the event Zambia is not able to obtain maize from its neighbors, Zambia would have to arrange for importing maize from outside the SADCC region. The time to import maize from North America could reach four months or more. Such lead time coupled with an early projected stock-out would present a situation where emergency stocks would be essential for temporarily supplying the consumers.

(3) The ability of Zambia to pay for the stocks. The GRZ has minimal funds that are spread over many activities and absorbed by many parastatal organizations (with little chance of breaking even). In Zambia, inflation at about 100%, interest rates between 40 and 50%, and maize storage losses as high as 20%, have made it extremely expensive to hold security stocks.

Funds for purchasing local or imported maize for the security stock are equally hard to come by without donor support. When maize is imported from South Africa, donor support funding has not been available. (This may change within the next few years, as South Africa undergoes political reforms that may lead to the Western countries lifting their trade sanctions.) Instead, Zambia has had to find another source for the funds. The present shipment of 150,000 90-kg bags (13,500 mt) of maize to Zambia is being paid for by Zambia swapping its copper for South African maize.

In the case of importing maize from Zimbabwe, as was done earlier in 1991, donor support funding has been available to Zambia. The imported maize has not been cheap from Zimbabwe or South Africa. Zambia paid USD 195/metric-ton to Zimbabwe for its 13,000 metric tons bought in 1991.

(4) The magnitude of suitable storage available for reserves, given that other harvested stocks must also be stored. Though a substantial storage capacity in silos and warehouses exists, it won't be until after the Germans are able to rehabilitate many of the large warehouses (built years ago with Germany's financial and technical support along/near the rail line) that suitable and strategically well-placed storage facilities will be available for long-term storage of maize. It is primarily along the rail-line, reaching from South of Lusaka to the Copperbelt, where a great majority of the urban consumers live and where the greatest need is for locating the reserve.

(5) The impact the reserve may have on the private maize market. If the reserve is very large (as is a reserve of 2.5 million bags), private buyers and sellers may be reluctant to participate in buying and selling maize, especially if Government market intervention policies are unclear (McKenzie, 1991).

Recommendations. The following recommendations on modifying the size of the security stock have been proposed by various experienced sources in Zambia.

(1) Given that the CREWS is capable of forecasting in October the point at which domestic stocks will be exhausted, and that the local maize crop will last until at least March of each year, and given that maize may not be available from neighboring countries (e.g., Zimbabwe or South Africa) but instead need to be imported from abroad, for example, North America, which may take four months or more, it has been recommended, then, that an emergency reserve of about 1 million 90 kg bags (about 90,000 metric tons) of white maize be maintained. This reserve would represent the current monthly, urban consumer demand for maize. The consumer demand of rural households for maize is not included in the emergency stock size determination since they are considered capable of producing their own food requirements even in years of poor rainfall (Subrahmanyam, personal communication, 1991).

(2) In order to ensure adequate supplies of maize for urban markets in the country in years of crop shortfall, it is recommended that the likely size of imports be considered in the event of the worst crop shortfall. It is critical in this situation that a comparison of the cost of imports versus the cost of storage for one or more years be made. The largest maize imports ever required in one year in Zambia was about 3 million 90-kg bags. Thus, a reserve of 2.5 million bags, if carried forward, is effectively providing almost entirely for the worst possible situation which the country has ever faced in any one year in the past (McKenzie, 1991).

(3) According to the Zambian Commercial Farmers Bureau, the need for a maize reserve has increased due to the apparent change in the local rainfall pattern, which makes maize growing more risky even if short season varieties are planted. In the past, a stock of 2.5 million bags has been held. There may now be a need for increasing this stock level to about 25 percent of current consumption levels or 3.125 million bags (CFB, 1991).

(4) An alternative method practiced in other sub-Saharan countries and proposed (while in discussions with USAID/Zambia) for determining emergency stock size is to relate different stock sizes to both the cost of maintaining, recycling, and replenishing the stock and the probability of such a stock being sufficient to prevent a stock-out in the case of emergency (production shortfall) situations. In the case of Zambia, the probability of the emergency stock being sufficient to prevent a stock-out would be directly related to the probability of importing white maize from neighboring countries such as South Africa and Zimbabwe. If neighboring countries were unable to export maize to Zambia, maize (white, if available, or, if not, yellow) would need to be imported on the international market. The additional time it would take for such imports to reach Zambia would mean the probability of a stock-out would be higher. If, however, Zambia received information, in e.g., August, from South Africa and Zimbabwe (or other Southern African Development Coordination Conference (SADCC) countries) that white maize would not be available for export to Zambia that year, Zambia could decide to import maize from e.g., North America in August or September. Zambia, then, would have imports arriving in advance of January's potential stock out situation. The key in this scenario is that Zambia have relatively instant access to funds for purchasing the maize. A financial stock, either GRZ or donor financed, would thereby be a trade-off from having the physical stock. These assumptions in this scenario do not guarantee a stock out would not occur; there are practical constraints which may delay the arrival of both the necessary market information and the imported maize itself. Refinements in the SADCC Food Security information system could serve an important role in getting Zambia the necessary international/regional production and market information. If the GRZ wanted to pursue a 100 percent probability of not having a stock-out, the emergency stock size may need to be as large as the equivalent of four or more months of urban maize consumption requirements. A lower probability of not having a stock out is related, then, to a smaller emergency stock size (Kottering, 1988).

With respect to famine relief efforts, the amounts of maize required in the past for these purposes have not been large. Furthermore, it has been stated that famine relief should be approached from the vantage point of what cereal grains are available in Zambia not from the standpoint that maize necessarily must be made available for relief measures. Rice, for example, has been readily available in food shortage areas west of the Zambezi, when at the same time people in that region were calling for maize and maize meal. If purchasing power is a problem, the sale of cattle in order to obtain cash should be considered by those people otherwise unable to buy food (Mornement, personal communication, 1991).

For the above reasons, it is probably not crucial that the maize reserve be established to provide explicitly for famine relief in these isolated areas. It is proposed that famine relief maize be provided from either reserve or commercial stocks assuming that donors will continue to provide funding to pay for maize for these purposes.

SECTION III

UTILIZATION OF THE NATIONAL FOOD SECURITY STOCK

The Decision to Use the National Food Security Stock

In 1986, a National Preparedness Plan was produced by a task force of Zambian officials and a FAO mission. The Plan, in the form of a manual, details the actions required at national, provincial, and district levels to identify and cope with food emergencies (GRZ, 1986; FAO, 1989). The Plan has not been implemented. However, with the new Government in place in Zambia in 1991, there are indications that the Plan after some revisions may be implemented.

The GRZ has tried to maintain a strategic maize reserve to ensure that sufficient stocks are always available to cover market demand and to permit the GRZ to cover special distribution requirements to vulnerable groups in drought-prone areas during years of crop failure. The decisions regarding use of the national strategic maize reserve and the need for importing maize are said to be made by the National Committee on Early Warning during its two annual meetings. However, the NCEW has obviously not had the final word as to the use of the maize reserve stocks. The maize stocks procured by ZCF from the Cooperative Unions have generally been kept not for emergency purposes but instead for maintaining commercial supplies on the market. Part of the reason why even reserve emergency stocks are used for the wrong purposes in Zambia is that maize deficit provinces (like Lusaka and the Copperbelt, where nearly 40% of the total maize demanded in Zambia is consumed) experience cereal shortages in urban areas because the formal marketing sector is unable to access rural surpluses due to a shortage of funds, lack of credit, and poor transportation (SADCC, 1991). Consequently, although ZCF has been designated by the GRZ to manage and maintain the maize reserve, Zambia, currently, has no maize reserve stocks.

When there are natural calamities, the GRZ usually distributes food to the affected families through the Famine Relief Program Unit coordinated by the Ministry of Agriculture and the Contingency Planning Unit in the Cabinet Office. Currently, famine relief is not handled from the reserve stocks. It is usually provided through donor funding with maize purchased from current Cooperative Union stocks (McKenzie, 1991). The GRZ has been selling relief food to famine victims (sometimes at subsidized prices) to avoid making the famine victims dependent on free food from the GRZ. On exception, food is given free of charge, only after a thorough analysis is done on the conditions of the famine victims (Banda, 1989).

One proposal to get the GRZ on track with its maize reserve policy and operations includes the setting up of a Maize Reserve and Marketing Policy Committee. The Committee would direct the management of the maize reserve and advise the GRZ on how to coordinate the operation of the reserve with other aspects of maize marketing policy. It has been proposed that the Committee be composed of the Chairman from the Cabinet Office, Permanent Secretaries from the Ministries of Cooperatives, Agriculture, Finance, and Commerce and Industry, et.al. (McKenzie, 1991). Setting up a Committee such as this along with establishing a new GRZ funded organization to solely manage the maize reserve would probably be the most

effective means of getting the most appropriate decisions made regarding the use of the maize reserve.

History of Security Stock Utilization

The history of utilization of the security stock has not been well documented. For some years the government has had a policy of trying to maintain a maize reserve of 2.5 million 90-kg bags (225,000 metric tons). However, the reserve has never reached this amount even in years of large domestic production surpluses, as in 1987/88 and 1988/89 (Table 1). In those years, however, there were large carryover stocks (retentions) of maize held by the Cooperatives. There has never been sufficient funding to allow ZCF to purchase and maintain 2.5 million bags as a security stock (McKenzie, personal communication, 1991). It has been said, though no documents are available to substantiate the figure, that the largest maize reserve held in Zambia in recent years has been 700,000 90-kg bags (Clemon, personal communication, 1991). However, any maize in the reserve has been co-mingled with the working stocks and has generally not been successfully held for a long period of time without significant storage losses; and, then, when the stock was needed the quality was poor. For example, a large shipment of maize sent by NAMBOARD to Mozambique in 1989/90 was rejected by the WFP because the maize was of poor quality.

In 1990 and 1991, Zambia did not have a maize reserve. In early 1991, the funds (1 billion Kwacha) allocated to the ZCF to purchase 2.5 million bags for the maize reserve were spent transporting maize to ZCF storage, and then to the mills. None of the maize was kept for reserve.

Recycling the National Food Security Stock

Because the security stock has, generally, been utilized within the same year of local procurement, recycling has not been a necessity or a practical issue.

TABLE 1

Maize Production, Marketings, and Retentions for the Years 1982/83 to 1990/91

Year	Production (000 bags)	Marketings (000 bags)	Retention (000 bags)
1981/82	10,392	5,902	5,490
1982/83	9,686	6,348	3,348
1983/84	12,471	7,070	5,401
1984/85	13,673	10,607	3,066
1986/87	11,816	7,296	4,520
1987/88	21,591	14,990	6,601
1988/89	20,500	13,546	6,954
1989/90	12,140	4,900	7,240
1990/91*	16,087	9,000	7,087

*Estimated

Source: McKenzie and Chenoweth, 1991

SECTION IV

FOOD SECURITY INFORMATION SYSTEM

In Zambia, the Crop Forecasting and Early Warning Unit (CFEWU) is responsible for estimating crop production, the marketed surplus for maize, and import needs (Banda, 1989). The CFEWU in the Ministry of Agriculture is responsible for the establishment of the information system and for collection, processing, interpreting and monitoring information from district and provincial levels as well as from various national sources (GRZ, 1986). The CFEWU has been issuing a quarterly Food Security Bulletin. The Bulletin's information is confined to the major monitored staple commodities in Zambia, namely maize, wheat, rice, and millet/sorghum. Information is obtained currently from nine collaborating institutions, including the Ministry of Cooperatives, the Central Statistics Office, the Department of Meteorology, Zambia Seed Company, Nitrogen Chemicals of Zambia, the ZCF, the National Food and Nutrition Commission, the Commercial Farmers Bureau, and the Contingency Planning Unit of the Cabinet Office (Zambia CFEWU, 1991). The CFEWU is presently staffed by an FAO advisor and his Zambian counterpart. Two-hundred fifty part-time enumerators have been hired to collect in the months of August/September each year producer grain sales information from sixty producers each (representing about two percent of the total 750,000 producers in the country). Additional staff have been requested in order to expand the data collection activities to include collecting commodity market prices, etc. (Hiemstra, personal communication, 1991).

For maize, the CFEWU, in conjunction with the Early Warning Coordinating Committee (EWCC), estimates crop production and marketed quantities of maize in February and April each year. These estimates are given to the NCEW which is headed by the Permanent Secretary of the Ministry of Agriculture and composed of directors of the departments and institutions supplying information to the CFEWU. The NCEW meets twice a year to discuss the reports on preliminary and final crop forecasts and resulting supply situation at the national level (Banda, 1989).

The CFEWU develops Maize Balance Sheets that include not only the opening and closing stocks, harvested production, consumption requirements, losses, and actual imports and exports, but also the total imports expected and the total exports (official or unofficial) expected. Maize balance sheets for 1977/78 to 1990/91 are given in Tables 2, 3, and 4.

A significant item included in the maize balance sheet, as of September 1991, is the estimation of unauthorized cross border exports. Such exports take place due to price differentials and domestic marketing problems (SADCC, 1991). The total expected exports of 175,000 metric tons of maize (mostly to Zaire) are difficult to assess and quantify but are a necessary inclusion into the equation, else the current stock level becomes very misleading.

The CFEWU also provides information to SADCC's Early Warning System (EWS) in Harare, Zimbabwe. SADCC's EWS also issues a Quarterly Food Security Bulletin. The release generally follows Zambia's CFEWU's quarterly bulletin by about 10 days. SADCC's regional perspective on food security provides each of the SADCC countries, including Zambia, with an up-to-date stock situation and outlook

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report. The added information from SADCC is valuable to Zambia and other SADCC countries in that it may promote more efficient inter-regional trade and development. Refinements in the coordination (and information exchanged) between each of the SADCC country's EWS and the SADCC's EWS, could help to cushion the effects of drought and other natural calamities within Zambia and the other SADCC countries.

TABLE 2

Maize Balance Sheets in Zambia
1977/78-1983/84

ITEM	77/78	78/79	79/80	80/81	81/82	82/83	83/84
	----------million 90 kg bags----------						
A. Opening stocks	3.62	3.86	2.77	0.7	1.1	1.32	0.95
B. Purchases	7.74	6.46	3.73	4.25	7.7	5.67	5.9
C. Imports	-0.7*	0.02	1.52	2.94	0.54	1.24	1.11
D. Total (A+B+C)	10.66	10.35	8.02	7.89	9.34	8.23	7.96
E. Closing stocks	3.87	2.77	0.7	1.1	1.32	0.95	0.82
F. Deliveries to mills, losses (D-E)	6.79	7.58	7.32	6.79	8.02	7.28	7.14

Source: GRZ/MOA, 1988 Agricultural Statistics Bulletin
* Negative number represents exports in 1977/78.

TABLE 3

Maize Balance Sheets in Zambia
1984/85-1989/90

ITEM	84/85*	85/86*	86/87*	87/88*	88/89#	89/90#
	----------million 90 kg bags----------					
A. Opening stocks	0.82	0.37	1.45	3.6	N/A	9.0
B. Purchases	6.35	7.07	10.61	7.30	14.99	13.56
C. Imports	1.06	1.08	0.16	0.71	0	0
D. Total (A+B+C)	8.23	8.52	12.22	11.61	N/A	22.56
E. Closing stocks	0.37	1.45	2.5	0.57	N/A	N/A
F. Deliveries to mills, losses (D-E)	7.86	7.07	9.72	11.04	N/A	N/A

* Source: GRZ/MOA, 1988 Agricultural Statistics Bulletin
# Source: GRZ, 1990.

TABLE 4

Maize Balance Sheet in Zambia
as of September 1991

ITEM	TOTAL	URBAN
	----'000 metric tons----	
1. Opening Stock on 01/05/90	215.30	215.30
2. Gross Domestic Production	1447.80	630.60
3. Total Domestic Availability (1+2)	1663.10	845.90
4. Gross Consumption Requirements	1441.00	973.0
5. Carry-over Stock Requirements	225.00	225.0
6. Breweries, stockfeed and seed	180.20	---
7. Total Requirements (4+5+6)	1846.20	1198.00
8. Losses	(100.00)	(50.80)
9. Domestic Balance (3-7-8)	(283.10)	(402.90)
10. Imports already received	19.00	19.00
11. Imports still expected	150.00	150.00
12. Total imports expected	169.00	169.00
13. Exports to date	100.00*	
14. Exports still expected	75.00*	
15. Total exports expected	175.00*	
16. Uncovered Import Gap (8+12+15)	(289.10)	(233.90)
17. Current Stocks	297.30	297.30
18. Forecast Closing Stocks (30/04/92)	0.00	0.00

Source: ZCF, Marketing and Logistics Information Centre
* Unauthorized Cross Border Exports (Estimates).

SECTION V

PUBLIC SECTOR FOOD STOCK MANAGEMENT ORGANIZATIONS

Zambian Cooperative Federation

The ZCF is currently responsible for the maize reserve, the importing and exporting of grain, and the interprovincial marketing of maize. ZCF is not a parastatal but is a part of a cooperative system that is very largely a creation of government and has received a great deal of government support. The system consists of four distinct tiers. ZCF is the national apex organization. The next tier consists of nine Provincial Cooperative Unions (PCUs). The third tier consists of thirty-two District Cooperative Unions (DCUs) created in 1989 while the fourth includes about 1400 Primary Cooperative Societies. ZCF, which became operational in 1976, is owned by the nine PCUs and six other organizations in Zambia that utilize its services. There are about 500,000 members in the Primary Cooperative Societies at the grassroots level that ZCF serves (McKenzie and Chenoweth, 1991).

Unlike cooperative systems in some other parts of the world, the top two layers of the structure are stronger and more active than the bottom two (GRZ, 1990). In practice, the Primary Societies and the DCUs are financially quite weak and very dependent upon decisions taken by the GRZ, ZCF, and the PCUs (McKenzie and Chenoweth, 1991). The Cooperative Unions have low levels of capitalization and few, if any, financial reserves to cover losses. When losses arise, the Cooperative Unions turn to the GRZ for increased subsidies. So long as the Cooperative Unions operate within the GRZ's business rules regarding maize marketing, the GRZ has little alternative but to respond positively to the Cooperative Union's requests.

Such a situation of increasing maize subsidies (to the tune of over 13 percent of the GRZ's total budget in 1990) is not one that the GRZ can sustain. It has been recommended that the Cooperative Unions be free to take business decisions that enable them to maximize financial returns and benefits to their members. Also, it's been recommended that government policy should encourage the Cooperative Unions to strengthen their equity capital position through both retained earnings and increased member contributions.

There is some consensus among those directly and indirectly involved in the establishment of a food security stock policy that a new government controlled body or a contracted private sector company (underwritten by the government on a cost-plus basis) be named to be responsible for the national maize reserve (CFB, 1991). With ZCF managing the reserve, there is potential for conflict of interest between the activities of the Cooperatives (including ZCF) and the activities of the government. This is particularly the case since major maize purchase and sale decisions for the reserve may impact on the domestic prices for maize and meal (McKenzie, 1991). It has been recommended that the new government controlled body or contracted private sector company maintain the reserve stocks in silos or sheds, purchase stocks if possible directly from the domestic market, recycle the stocks by selling the stocks, and import and export stocks as required. The budget for managing the reserve would need to be provided by the government.

Cooperative Structure and Storage Capacity

The ZCF was set up as a private-sector production and marketing cooperative, rather than a grain-handling organization. Most of ZCF's organization does not relate to the security reserve. The three divisions of ZCF that do relate to the reserve are the Marketing and Logistics Center, the Operations Division, and the Commercial Services Bureau. The Marketing and Logistics Information Center maintains records of grain storage capacity, including that available for the reserve. The Operations Division manages certain facilities, including the NAMBOARD silos which were taken over by the GRZ. Also, the Commercial Services Bureau provides pest control for security stock grain and to other cooperatives and businesses on a custom basis.

A recent FAO report (Pattinson, 1990) lists a national level storage capacity of about 3,600,000 bags (324,000 mt) in sheds and about 108,000 mt in silos. The most recent Ministry of Agriculture survey (Table 5) reports a capacity of 6,090,000 bags (548,000 mt) in sheds and 124,000 mt in silos. The differences between the two studies may be due, in the case of silos, to the Ministry including all silo capacity, whether or not it is currently used. Also, new sheds and warehouses have been built and concrete plinths have been converted to sheds since the early 1990 report.

The current total capacity for grain storage is reported to be nearly two million metric tons. However, over half of this consists of concrete plinths (platforms), or platforms of logs or railroad ties laid side-by-side on the ground, over which stacks of bags are built. The silos referred to in the table are mostly concrete upright structures similar to those used in the United States. However, they are 1950's technology and are said to be often under repair. Sheds are of various types, and it is impossible to determine from the reports how much of each type there is.

Included in the "shed" category are certain brick warehouses which are new and in good condition. Evidently the vast majority are pole buildings over concrete platforms. Sheds of this type that have any wall at all have sheets of corrugated metal which do not reach the roof. Much of the storage capacity is poorly located for use with grain (Pattinson 1990). Many of the relatively good sheds are used for fertilizer, seeds, and other high-value commodities, rather than for grain.

At present the storage capacity that could be considered adequate for security reserve grain (which must be held for more than a year) is small compared to the need. Some of the silos may be too unreliable and most of the shed storage is likely to be unsuitable or already designated for other uses. Various schemes to increase sound storage capacity have been discussed. Canadian and Japanese projects have recently increased warehouse and shed space, and other donors (FAO, BID, etc.) have developed proposals to construct new storage facilities or rehabilitate old. However, since the current political environment is unclear, it would be difficult to predict whether the proposals will be implemented.

Staff Training

NAMBOARD, the parastatal which for years monopolized maize marketing, trained many people in pest control and grain quality maintenance. Most of these people

apparently have found jobs in ZCF or the Provincial Cooperative Unions (PCU's), which have trained some of their own people in these fields through the years. KSU has received several Zambians in the past few years for short-term training, and warehouseman's training, including training in pest control and grain sampling and inspection, has been provided to NAMBOARD and PCU people by the Australians and the British. Some of this training was rather long-term (several months). In addition, short-term, in-country training has recently been given to more than 100 PCU employees through an FAO project.

Pest Control and its Effectiveness

According to ZCF personnel, provincial cooperatives in Eastern and Copperbelt Provinces maintain teams of pest control specialists and equipment. The main function of ZCF's Commercial Services Division is to supply agricultural inputs, but it also fumigates grain on a custom basis. Commercial Services functions like a private company, and applies insecticides in addition to fumigating. PCU's and processors utilize Commercial Services, which has teams in Lusaka and two other locations within the main areas of agricultural production.

Notwithstanding the cadres of people trained in grain storage, including the techniques of fumigation, grain quality is not maintained in most cases. This has been stated in various reports, emphasized in several interviews, and confirmed by site visits. Those interviewed included expatriates close to the storage situation as well as Zambians employed by grain handling, storage, and processing organizations. Interviews with ZCF, PCU, and processing company people, and visits to storage sites resulted in the following description and analysis.

Grain inspection at purchase or receipt, which is the first step in a comprehensive quality maintenance program, is absent from the Zambian grain storage system. In theory, cooperatives or millers may reject grain that exceeds certain tolerances of grain moisture or impurities content. However, the simple equipment necessary to determine these parameters was missing or broken at the sites visited. The Lusaka cooperative, for example, is said to own a moisture measuring device for each of its 51 buying depots. However, most are reportedly lost or broken. Even at the central depot - the safe storage site, in PCU jargon - the small laboratory scale used in the determination of percentages of broken grains, damaged grain, etc. had broken some time previously and had not been repaired.

Sources said that NAMBOARD enforced an inspection and grading process some years ago, but for various reasons, had abandoned it. Today only the terminology remains. Maize is classified as grade A, B, or C, which are "consumable" and D, which is not for human consumption. However, the "grading" is done subjectively and only to detect badly discolored grain in order to separate it.

It became obvious from interviews that serious in-bound inspection was abandoned because it served no purpose, given that politics and policy prohibited discounting or rejecting deteriorated grain anyway. Also, due to constraints in transportation, various qualities of maize must be intermingled in transport from the buying depots to the main depot. At the out-bound side, no penalties for deteriorated grain nor premiums for good-quality grain were possible. The abandonment of this first component of a grain quality maintenance program

appears to have been a logical response by grain handlers to the lack of incentives.

According to ZCF Commercial Services people, they usually are called in to stop an infestation that has already caused a great deal of damage. Ideally, fumigation should be used to kill an infestation before it causes major deterioration. In order to detect infestation at that stage, monthly inspections are a standard part of a good warehouseman's quality control scheme. This second step of an integrated approach to pest control also appears to be absent among grain storekeepers in Zambia (with the exception of processor's own storage). Nowhere in the cooperative system could the KSU team find evidence of a program of periodic inspection of stored grain. The result is that preventive pest control measures are not applied and the corrective measure (fumigation) is applied in an inefficient manner.

Cleanliness and orderliness are also standard tools of the grain sanitarian. However, these techniques rely on periodic inspection to assure their success. Since inspection is not done on a systematic basis, neither is sanitation, the third component of an integrated program. No one in the organization gets a promotion when the warehouse runs efficiently and grain quality is maintained. No one is penalized when grain deteriorates. Therefore, there is no incentive to do routine cleaning or properly order the warehouse.

Another tool of the grain storage manager is a soundly-constructed store. Much was made in reports and interviews about the lack of proper storage facilities. The platform structures provide no protection against rodents, and protection against wetting by rain is often compromised. It is also more difficult to control insects and the movement of ground moisture into the stack under these conditions. That is why so little of the nominal storage capacity is considered adequate for long-term storage. In general, however, it appears that lack of incentive, rather than lack of facilities is the root cause of the current high level of losses in storage.

At the Lusaka storage site, grain was held for ZCF, National Milling Company (NMC), and the Lusaka cooperative in the silo, on concrete plinths, and in sheds without walls. Ten recently-rehabilitated sheds at a nearby location were used for groundnut and fertilizer storage, but not for maize. Loads of maize were being received from Eastern province. It appeared dry and sound. A few stacks were being dismantled, which allowed access to the inside of the stack. The maize deep inside these stacks appeared to be in acceptable condition.

Stacks were well built and some were very well covered. However, the vast majority of the grain was in stacks whose outside layers were heavily infested with maize weevils and flour beetles. Samples from one such bag contained 3 to 5 % insect-damaged kernels and was developing an objectionable odor after two months of storage at the site.

The NMC grain was being fumigated the day of the visit. The tarpaulins and techniques appeared to be adequate, although safety procedures were less than thorough. Grain belonging to the cooperative, because it was to be held only 3 or 4 more months, was not programmed for fumigation. Rodents were said to be a problem, but no control measures were used.

In addition to the insect-damaged kernels observed in the outer layers of the stacks, grain damaged due to leaky tarpaulins and ground water seepage was observed. Damaged grain, which may have amounted to one or two percent of the total, was separated from the sounder grain. Grain in one such partial stack had been damaged by heating before receipt. The other consisted of grain damaged by water seepage. The manager said that the two layers of bags closest to the plinth are often damaged by ground water seepage.

At Chingola, maize belonging to the United Milling Company was held in new brick warehouses provided by the Japanese at a PCU site. The grain had been purchased from local cooperatives nearby, and had been held in the warehouse for about a month. It was 1991-crop maize harvested in July; thus must have been held at some PCU depot for about three months prior to delivery. Although it had recently been fumigated by the ZCF Commercial Services people, it was badly damaged. Samples taken from various places accessible at the outside of the stack showed from 15 to 40 % insect-damaged kernels. The fumigation had slowed the infestation considerably, but at certain places at the periphery of the stack the infestation of live maize weevils and flour beetles was intense. It was estimated that at least 20% of the kernels in the entire stack had already been damaged, and the damage was continuing.

Near Kitwe, a small amount of maize was left from this year's harvest and was kept in similar warehouses. It was not quite as badly damaged, but quite infested. Also seen at Kitwe was the silo currently operated by ZCF. It was empty, but was being used as a transfer point for the current importation of South African maize. It appeared to be in relatively good shape. Make-do mechanical arrangements were in evidence, and non-essential systems were abandoned when they failed, but it was said to be functional and could safely store grain if a few leaks in the roof were repaired. It had an operational fumigant recirculation system for methyl bromide. The silo at Ndola was in greater disrepair, and its fumigation system was not functional.

Also at the Ndola ZCF site was a gangee-type stack on a concrete plinth. The maize belonged to a milling company, and an expatriate advisor was said to have been present during its construction. It was very well covered, well built, and had been fumigated. It was only lightly infested and exhibited no insect damage. The grain was in sound condition. Although at this site, as at others, no one was responsible for inspecting the stack periodically to scout for insects, rodent damage, damaged tarpaulins, wetted grain, moisture condensation under the tarp, etc., quality was maintained, at least through the first few months of storage. One advantage at this location was that the stack was isolated from other grain. The major difference, however, seems to have been that someone cared enough to call for a fumigation before damage occurred, and to secure good tarpaulins.

The impact of grain deterioration can often be measured at the processing plant. NMC millers in Lusaka estimated that through the final six months of the last storage year (January to June, 1991) they were able to extract only 72 to 75 % meal from the maize due to the poor condition of available raw product. This means only 64.8 to 67.5 Kg of meal could be made from each 90 Kg bag of maize, instead of the 72 Kg that should have been possible. Some of this loss was recovered in the increased quantity of by-product for sale. However, since the meal is worth more than three times the value of the by-product, little of the

financial loss is recovered. The quality of the final product is also reduced when deteriorated raw product is used.

At Chingola and Ndola, there seemed to be less concern about loss of efficiency due to low quality of the raw product. Rather, the United Milling Corporation production people were concerned that when poor quality maize was received, the percentage of the higher-grade corn meal called breakfast meal was reduced. Their concerns resulted from the fact the higher-grade product can legally be sold for a higher price.

However, insect damage, per se, was not associated in their minds with low output or quality. Production people at all mills complained about not being able to reject excessively deteriorated grain, especially that which was blackened due to water damage or heating. Since they are beholden to government for subsidies, they are vulnerable to political pressure applied through government by someone whose grain is rejected. They also said that if they complain or reject loads from the cooperatives (the sole in-country supplier), the damaged grain is simply hidden in other loads and returned to them.

In general, the record of the current grain storekeepers is not good relative to grain quality maintenance. This speaks poorly of their ability to manage an emergency grain reserve. A true emergency grain reserve has to be stored for two or three years under normal circumstances. During that period of time its quality must be maintained so that its cost is recovered when it is rotated out for new grain. There is little reason to believe that the current storekeepers, as they are presently organized, would successfully manage this task.

TABLE 5

Zambian Storage Capacity in Sheds and Silos

Province	Sheds Number	Number bags	Silos Number bags	Total Number bags*
Central	10	326,000	494,500	4,758,828
Copperbelt	4	220,000	415,560	2,175,560
Eastern	47	1,990,500	0	3,355,875
Luapula	26	155,790	0	454,589
Lusaka	49	428,400	198,000	1,275,400
Northern	200	1,267,930	0	2,200,828
Northweast	53	273,763	2,000	568,791
Southern	39	539,600	270,000	6,087,057
Western	10	308,000	0	655,550
Total (1990)	438	5,509,983	1,380,060	21,532,478
New construction (9/91)	29	580,000	0	580,000
Total bags (1991)	467	6,089,983	1,380,060	22,112,478
Total Capacity (metric tons)		548,098	124,206	1,990,123

*includes outdoor storage (plinths, log or pole platforms, etc.)

Source: ZCF Marketing and Logistics Information Centre

SECTION VI

DONORS SUPPORTING THE FOOD SECURITY PROGRAM

Donor support has come primarily in the area of food aid, storage facilities, and technical assistance.

Food Aid

The most recent nearly-widespread drought in Zambia dates back to the 1987 crop year, when production was only 1,063 mt of maize (FAO, 1991). That year, 55,500 metric tons of maize was donated by six countries (the Netherlands, Canada, Italy, Kenya, Australia, and the EEC) and the WFP and K55,500 million plus USD 1 million was donated by four donors (the USA, the Netherlands, Canada, and the EEC). Much of the maize actually came from Zimbabwe. Approximately 50 percent of the maize was distributed free while the other 50 percent was sold at a subsidized price (Hankanga, personal communication, 1991). Since 1988/89, donors have not been supplying Zambia with food aid maize because Zambia has had a number of surplus years and good carryover stocks (Table 6).

Storage Facilities

In recent years, Canada and Japan have donated many storage facilities in Zambia. In the mid-1980s, Canada installed for NAMBOARD 84 storage sheds and 23 depots along the rail-line. Over the next three years, CIDA, the Canadian International Development Agency, will be working rehabilitating the sheds (Denis Dunn, personal communication, 1991). From 1985-1990, Japan constructed twelve brick-walled storage sheds in the Copperbelt, Central, Eastern, and Southern Provinces. Japan has made plans to construct another twelve in the coming years (McKenzie, personal communication, 1991).

Technical Assistance

USAID/Zambia has provided long-term (8 years and running) technical assistance including food security stock policy assistance through its Zambia Agricultural Training, Planning, and Institutional Development Project (ZATPID II). FAO has developed the Marketing and Logistics Information Center in the Ministry of Agriculture, Food, and Fisheries that has collected and analyzed data critical to the implementation of a maize reserve. The Early Warning Unit funded by the Government of the Netherlands in collaboration with the FAO has developed the Crop Reporting and Early Warning Systems to the extent that the CREWS is now capable of forecasting production well in advance. Other donors of technical assistance include the British, Swedish, Norwegians, and others.

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TABLE 6

Cereal Production and Imports (1981-1991)

Production Year	Maize Produced '000 mt	Marketing Year	Imports NAMBOARD '000 mt	Food Aid '000 mt
1981	1,007	1981/82	53	100
1982	750	1982/83	123	83
1983	935	1983/84	110	72
1984	872	1984/85	184	116
1985	1,122	1985/86	107	85
1986	1,230	1986/87	15	115
1987	1,063	1987/88	70	145
1988	1,943	1988/89	N/A	66
1989	1,860	1989/90	0	0
1990	1,093	1990/91	0	0
1991	1,448	1991/92	N/A	N/A

Source: FAO, 1991.

SECTION VII

IMPACTS OF STOCK MANAGEMENT POLICIES

There was no maize security stock policy being implemented in Zambia at the time the KSU team visited Zambia. The stocks that ZCF purchased soon after harvest that were to be for the maize security reserve went straight into the commercial market in 1991/92 after the supply of maize to the mills was considered short. The maize that ZCF has bought from producers at high government-subsidized prices (pan-seasonal and pan-territorial) and the mealie meal that ZCF has sold to consumers at low government-subsidized prices (pan-seasonal and pan-territorial) have benefitted producers and consumers, respectively. The government subsidies on producer and consumer prices (Tables 7 and 8) have resulted in it being much cheaper for producers to buy back the mealie meal from ZCF than to mill it or have it milled.

In 1991, the producer price was K800/90-kg bag while the price for breakfast meal (highly processes maize) and roller meal (not-so-highly processed maize) was K215/kg (K774/90-kg) and K158/25 kg (K569/90-kg), respectively. The K215/25 kg bag of breakfast meal that consumers are paying at government stores is only about one-third of the economic cost (K700/25 kg bag) of producing, milling, and marketing breakfast meal (Hudson, personal communication, 1991). Moreover, there is no potential margin for a private trader to do both the processing and the selling of breakfast meal or roller meal with those subsidies in place. The GRZ has, however, according to the Malawi Daily Times (December 17, 1991),

> "cut subsidies on maize meal and removed controls on meal prices with immediate effect, answering a key demand by donor nations as the government struggles to revive the country's shattered economy."

Maize producer subsidies remain and, in 1992, with private traders allowed to buy maize from the producers, the government's producer price will be essentially a floor price (to be adjusted as is necessary to remain equivalent to USD16/bag, that is, a price approaching the export parity price), that is, as long as the Cooperatives and mills have funds to buy maize (McKenzie and Chenoweth, 1991). For additional information on the GRZ's maize pricing policy see Appendix 2.

TABLE 7

Official Producer Prices for Maize, 1970-1992

Year	Kwachas/90-kg bag	In USD/mt
1970	3.50	
1971	4.00	
1972	4.30	
1973	4.30	
1974	4.30	
1975	5.00	
1976	6.30	
1977	6.30	
1978	6.80	
1979	9.00	
1980	11.70	
1981	13.50	
1982	16.00	
1983	18.30	
1984	24.50	
1985	28.32	
1986	55.00	
1987	78.00	
1988	80.00	
1989	125.00*	69
1990	284.20	79
1991	800.00#	119
1992	1200.00@	178~

* adjusted from an early season price of K108
# adjusted from an early season price of K500
@ to be adjusted with SDR index changes
~ approaching the export parity price
Source: ZCF, Marketing and Logistics Information Center

TABLE 8

Official Prices of Breakfast and Roller Meal, Mid 1985-Present

Time Period	Breakfast Meal	Roller Meal
	Kwacha/25 kg	
1980/81	4.10	3.75
1981/82	6.63	5.00
1982/83	7.25	6.31
1983/84	10.29	8.55
1984/85	12.90	10.74
1985/86	19.15	14.85
1986/87	19.15	14.85
1987/88	19.15	14.85
1988/89	19.15	14.85
Jan/1989	56.00	41.08
Feb/1989	70.00	52.00
Aug/1989	114.00	82.30
Jul/1990 to Present	215.00	158.00

Source: ZCF, Marketing and Logistics Information Center

SECTION VIII

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APPENDIX 1

PERSONS AND ORGANIZATIONS CONTACTED

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APPENDIX 2

MAIZE PRICING POLICY

Maize prices at the producer, into-mill, and consumer levels have been heavily subsidized by the GRZ for many years.

Producer Prices

The producer price is set by the GRZ in June before the planting of maize in November and December. The price is based on a cost of production formula consisting of a weighted average of the costs of three different types of producer. For the last three years these prices have been out-of-date by harvest time, although eventually adjusted upwards in two of those three years to allow for inflation.

The Government's price is the same in all parts of the country and throughout the crop year. Since most of the maize is sold by producers between July and October, the lack of seasonal variation in official producer prices may not be of major consequence. Up until 1991, the producer price was supported by the purchase of all maize by the official marketing agency.

Into-Mill Prices for Mills

The GRZ sets the into-mill price for maize based on a compromise between what the GRZ would like to see (to keep meal prices low) and what it figures it can afford in terms of marketing subsidies. The into-mill price is uniform regionally and normally stays constant for one year. The into-mill prices for 1980/91-1992/93 are given in Table 1. The 1992/93 into-mill price has been set roughly equivalent to current import prices for maize landed in Lusaka (McKenzie and Chenoweth, 1991).

Consumer Prices

In the 1970's and early 1980's the prices for breakfast and roller meal were set once each year in June at the same time as the producer and the into-mill prices for maize. In the mid-1980's a partial liberalization of meal prices was attempted. Public discontent with the partially liberalized meal prices, however, led to not only the reversal of the decision to partially liberalize meal prices, but also to the nationalizing of private mills and the fixing of meal prices for several years. In real terms, with inflation running at more than 100 percent, the meal prices during the mid 1980's declined substantially and the subsidies required to support those prices rose significantly.

After a coupon program for supporting the poor urban consumer was initiated in 1989 by the GRZ, meal prices took a big jump in January of that year. Subsequent increases in June 1989 and in July 1990 led eventually to public discontent. In September 1990, the GRZ announced another pricing policy change. In this case, the GRZ decided to deregulate the sales of maize by producers. With that information, the mills immediately reduced meal prices by 20 percent since they could now buy maize directly from producers at prices cheaper than before. Since then, meal prices have remained at the level of K215/bag for breakfast meal and K158/bag for roller meal. Presently, the official meal prices are very much lower than economic prices and are heavily subsidized at the mill level. Maize meal that is sold these days (November 1991) by private retailers has been selling in the range of K250-350/25 kg bag (Clemon, personal communication, 1991).

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TABLE 9

Official Into-Mill Prices for Maize, 1980/81-1992/93

Year	Kwacha/90Kg bag	In USD/mt
1980/81	10.21*	
1981/82	13.50*	
1982/83	16.00*	
1983/84	18.30*	
1984/85	26.00*	
1985/86	35.00*	
1986/87	35.00*	
1987/88	35.00*	
1988/89	35.00*	
Jan/1989	80.00*	
Feb/1989	108.00*	
Aug/1989	160.00#	89.00#
1990/91	442.00#	123.00#
1991/92	1100.00#	163.00#
1992/93	1800.00#	264.00#@

@Approximately the import parity price
*Source: GRZ/Ministry of Finance, 1990.
#Source: ZCF Marketing and Logistics Information Center