

**Tradeoffs Between Domestic and Imported
Cereals in Senegal:
A Marketing Systems Perspective**

by

**Mark D. Newman , Ousseynou NDoye
and P. Alassane Sow**

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SPECIAL NOTE FOR ISRA-MSU REPRINTS

In 1982 the faculty and staff of the Department of Agricultural Economics at Michigan State University (MSU) began the first phase of a planned 10 to 15 year project to collaborate with the Senegal Agricultural Research Institute (ISRA, Institut Sénégalais de Recherches Agricoles) in the reorganization and reorientation of its research programs. The Senegal Agricultural Research and Planning Project (Contract 685-0223-C-00-1064-00), has been financed by the U.S. Agency for International Development, Dakar, Senegal.

As part of this project MSU managed the Master's degree programs for 21 ISRA scientists at 10 U.S. universities in 10 different fields, including agricultural economics, agricultural engineering, soil science, animal science, rural sociology, biometrics and computer science. Ten MSU researchers, on long-term assignment with ISRA's Department of Production Systems Research (PSR, Département de Recherches sur les Systèmes de Production et le Transfert de Technologies en Milieu Rural) or with the Macro-Economic Analysis Bureau (BAME, Bureau d'Analyses Macro-Economiques) have undertaken research in collaboration with ISRA scientists on the distribution of agricultural inputs, cereals marketing, food security, farm-level production strategies and agricultural research and extension. MSU faculty have also advised junior ISRA scientists on research in the areas of animal traction, livestock systems and farmer groups.

Additional MSU faculty members from the Department of Agricultural Economics, Sociology, Animal Science and the College of Veterinary Medicine have served as short-term consultants and professional advisors to several ISRA research programs.

The project has organized several short-term, in-country training programs in farming systems research, agronomic research at the farm-level and field-level livestock research. Special training and assistance has also been provided to expand the use of micro-computers in agricultural research, to improve English language skills, and to establish a documentation and publications program for PSR Department and BAME researchers.

Research publications from this collaborative project have been available only in French. Consequently, their distribution has been limited principally to West Africa.

In order to make relevant information available to a broader international audience, MSU and ISRA agreed in 1986 to publish selected reports as joint ISRA-MSU International Development Paper Reprints. These reports provide data and insights on critical issues in agricultural development which are common throughout Africa and the Third World. Most of the reprints in this series have been professionally edited for clarity; maps, figures and tables have been redrawn according to a standard format. All reprints are available in both French and English. A list of available reprints is provided at the end of this report. Readers interested in topics covered in the reports are encouraged to submit comments directly to the respective authors, or to Dr. R. James Bingen, Associate Director, Senegal Agricultural Research and Planning Project, Department of Agricultural Economics, Michigan State University, East Lansing, MI 48824-1039.

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INTRODUCTION

Senegal's dependence on international markets for food grains dates from its colonial epoch. In the mid-19th century, cash crop production, especially peanuts, was promoted over cereal production. France opted for imports of cheap broken rice to Senegal from its colonies in Indochina in order to assure its own supplies of vegetable oil.

With independence, agricultural policy retained its orientation toward peanut production, with cereals production left as a subsistence, non-market enterprise. Today, however, the peanut is viewed as a "necessary evil," even as policy places increased emphasis on turning grain production into a cash-cropping enterprise (Le Soleil, Feb. 21, 1985, p. 12).

Senegal's Macro Food Situation

Despite a new focus on food crop production, production growth of 1.7 percent or less annually during the past decade is being rapidly outpaced by population growth rates approaching 3.0 percent per year.

During the 1974-1984 period, local grain production covered on average 65 percent of total needs, ranging from a maximum of 95 percent in 1975 to a minimum of 39 percent of total needs in 1984 (see Table 1). At the same time, commercial imports have been gaining in importance, growing from 31.1 percent of total available grain in 1974-1977 to 37.9 percent during 1981-1984.

Such imports result in major foreign exchange costs. An average of 326,000 tons of imported rice cost an average of 27 billion FCFA per year during 1980-1984, reaching a high of 33 billion FCFA in 1984 from 11.3 billion FCFA in 1977 (see Table 2). In addition, wheat, sorghum, and corn imports averaged 157,000 tons per year during 1980-84, reaching 191,400 tons in 1983.

The balance of payments situation has been aggravated by the peanut subsector. Instead of financing food imports, the peanut subsector has also become a drain on the

Table 1. Food Situation in Senegal, 1974-1985, 1,000 Metric Tons

	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1974-84
PRODUCTION	588.0	924.3	748.2	635.3	495.2	944.3	615.9	647.4	884.3	731.1	485.1	699.9
% Total	60.0	79.9	62.0	58.4	46.1	69.4	53.1	51.6	64.0	52.7	39.7	58.0
IMPORTS	328.2	216.1	422.5	407.0	476.7	378.3	435.0	456.8	418.8	567.4	536.7	422.1
% Total	33.5	18.7	35.0	37.4	44.4	27.8	37.5	36.4	30.3	40.9	43.9	35.0
FOOD AID	64.5	15.7	36.7	46.2	102.2	38.0	109.8	150.4	78.3	87.9	200.0	84.5
% Total	6.6	1.4	3.0	4.2	9.5	2.8	9.5	12.0	5.7	6.3	16.4	7.0
TOTAL	980.7	1156.1	1207.4	1088.5	1074.1	1360.6	1160.7	1254.6	1381.4	1386.4	1221.8	1206.6
CEREALS NEEDS	948.9	976.6	1004.4	1032.1	1061.8	1091.5	1121.2	1152.9	1184.9	1218.3	1252.0	1095.0
% Needs Covered	62.0	94.6	74.5	61.6	46.6	86.5	54.9	56.2	74.6	60.0	38.7	63.9

¹Crop years represent harvest of first year and imports of second, i.e., 1973/74 includes crops sown and harvested in 1973 and commercial imports and food aid from 1974.

²Cereals needs calculated in the basis of 198.1 kg per capita. Other sources use figures varying between 160 and 210 kg per capita.

Table 2. Senegal's Exports and Imports, 1977-1984, Billions of Francs CFA

	1977	1978	1979	1980	1981	1982	1983	1984
EXPORTS								
Peanuts & Products	75.5	23.5	41.7	19.9	9.2	44.3	59.4	54.8
Cotton	<u>4.9</u>	<u>3.4</u>	<u>3.5</u>	<u>2.2</u>	<u>2.0</u>	<u>5.0</u>	<u>9.7</u>	<u>5.7</u>
TOTAL	80.4	26.9	45.2	22.1	11.2	49.3	69.1	60.5
IMPORTS								
Rice	11.3	12.6	14.8	18.1	27.1	26.3	32.0	33.0
Wheat	4.6	2.9	5.4	4.5	4.8	5.3	8.2	8.5
Sorghum	—	—	—	—	—	—	—	—
TOTAL	15.9	15.5	20.2	22.6	31.9	31.6	40.2	41.5
Imports as % Peanut Export Value	21.1	66.0	48.4	113.6	346.7	71.3	67.7	75.7

national treasury, averaging a 13.5 billion FCFA annual deficit during 1980-83 (USAID). During 1980-1984, the value of imported rice and wheat averaged 135 percent of the value of exported peanuts and products. In 1983, rice and wheat imports cost only 68 percent of peanut generated export revenues, but the average was only 45 percent during 1977-79.

In light of this situation, the Senegalese government announced a New Agricultural Policy (NPA) in April 1984. The NPA emphasizes promotion of local grain production. This has been a recurrent theme in policy documents since the mid-1970s, including Senegal's Food Investment Strategy, and the sixth Development Plan. The NPA aim of increased food self-reliance and gradual substitution of locally produced for imported grain emphasizes incentives for production and consumption. It also focuses on the marketing system through which local cereals are exchanged. Emphasis is placed on assuring market outlets for producers, assuring supplies to consumers, and achieving government goals more cost effectively through a gradual transfer of responsibilities to private sector intermediaries and producer organizations.

The Importance of Marketing Systems for Locally Produced and Imported Grain

Most studies approach the question of tradeoffs between imported and local cereals in the semi-arid tropics of West Africa from the perspective of household consumption behavior. While consumer choice obviously has a major impact on demand, marketing systems policy affects both supply and the effectiveness of demand. In Senegal, as in many other countries, consumer choice is often constrained by the available range of commodities. The incentives for producers and intermediaries to supply locally-produced cereals to consumers are influenced by government marketing policies.

To evaluate such policies, the marketing systems for imported and local grain must be understood. The structural adjustment packages being adopted in many African economies emphasize increased reliance on the private sector to carry out agricultural marketing tasks previously handled by public and parastatal agencies. However, the empirical data upon which to base choices and strategies are often lacking (Mackintosh). The discussion that follows examines the rules and reality of the grain marketing system of Senegal. It is based on surveys of market intermediaries conducted since 1983 in three regions of Senegal, but primarily in the central Peanut Basin. The methodology of that study is summarized in Appendix 1. Finally, conclusions are presented regarding market policy, prices, and tradeoffs between local and imported grain.

PRIVATE AND PUBLIC CHANNELS IN SENEGAL'S GRAIN MARKETING SYSTEM

Senegal has a long tradition of state and parastatal involvement in the marketing of agricultural products. Private traders, however, have been important in the distribution of imported rice and sometimes in assembling grains, oilseeds, and other agricultural products. In 1980, faced with high costs, considerable unreimbursed credit, and a variety of other factors, ONCAD, the de facto national grain and oilseeds marketing board, was abolished. Since that time, Senegal has been undergoing an experiment involving the development of a legal private grain trade and occasional forays into grain markets by a public agency, the Food Security Commissariat (CSA). Rice, sorghum, and wheat imports are controlled by another public agency, the Price Equalization and Stabilization Board (CPSP).

An understanding of the process by which Senegal has remained reliant on imported grain requires examination of both the rules governing the actual organization and performance of the grain marketing system. These will form the basis for later discussion of market system policy and the tradeoff between local and imported cereals.

The Rules of the Game

Regulations and their enforcement have a major impact on incentives for the marketing system to function in accordance with government policy objectives.

The Private Sector

The rules governing assembly, transportation, and storage of locally produced grain--millet, sorghum, corn, and rice--have varied considerably since ONCAD was abolished. To "assure" markets for food crops and provide incentives for their production, the first stage is to specify who may participate in what marketing functions, when marketing transactions may take place, and under what conditions, prices, etc. This is true in many countries where state or parastatal agencies have traditionally been involved in marketing of cash crops. In four of the last six years, "official prices" were announced immediately before or during harvest, but the actual specification of legal participants in the assembly and transportation of grain occurred in December or January (see Table 3).

Merchants who handle more than 200 kg (8 bushels) of local millet, sorghum, and corn must be licensed. (In the case of paddy rice, assembly is still considered a government monopoly, so no licensing is provided for.) In addition to being licensed as a

Table 3. Selected Official Regulations of Millet/Sorghum Marketing, 1979/80 - 1984/85

Event	Periods					
	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85
Official opening dates of marketing season	Nov. 19, 1979	Nov. 19, 1980	Oct. 1, 1981	Nov. 15, 1982	Nov. 2, 1983	Oct. 15, 1984
Announcement of official prices	Nov. 19, 1979	Nov. 11, 1980	Oct. 1, 1981	Dec. 8, 1982	Nov. 7, 1983	Oct. 8, 1984
Signature of annual regulations specifying participants	Jan. 4, 1980	Nov. 11, 1980	Oct. 2, 1981	Dec. 8, 1982	Jan. 23, 1983	Dec. 21, 1984
Authorized purchasers/ first handlers - producer level	Authorized Licensed Wholesalers	Producer Cooperatives	Producer ¹ Cooperatives	- Producer Cooperatives - CAA - Authorized Licensed Wholesalers	Licensed Wholesalers Producer Cooperatives	Licensed Wholesalers - CSA - RDAS - Producer Cooperatives
Authorized purchasers from first handlers above	Authorized Licensed Wholesalers	- CAA - Processing Industries - Authorized Licensed Wholesalers	- CAA - CPSP - Authorized Licensed Wholesalers	- CAA - Authorized Licensed Wholesalers	- Licensed Wholesalers - CSA eventually	- CSA - Licensed Wholesalers - Rural Development Agencies

¹In March 1982, another decree was signed stating that, besides producer cooperatives, the CPSP, the CAA, and authorized licensed wholesalers were allowed to purchase millet from producers.

REFERENCES: Decrees 80-808 of Jan. 4, 1980; 80-1135 of Nov. 11, 1980; 81-889 of Oct. 2, 1981; 82-967 of Dec. 8, 1982; 84-053 of Jan. 23, 1984; and 84-1512 of Dec. 21, 1984.

trader, it is generally necessary to be licensed to handle a specific commodity on an annual basis. The list of traders licensed to handle millet has often been announced even later than the announcement of categories of legal participants in the grain trade, or not at all. During the 1983/84 and 1984/85 marketing seasons, licensing by commodity was not required, apparently because the crops were considered by Ministry of Commerce officials to be too small to warrant licensing (Sow and Newman).

The administrative regulations (*décrets*) specifying that any licensed wholesale merchant could participate in the grain trade were signed in January 1984 for 1983 and December 1984 for 1984. Harvested grain actually began to move into markets in September-October of both 1983 and 1984. This situation introduces considerable uncertainty for both private traders and producers. In the absence of annual regulations permitting them to participate in the grain trade, traders subject themselves to risks of fines or seizure of commodities by conducting their business in quasi-legality. Or, they shift their activities to other sectors, leaving farmers without market outlets and themselves with foregone opportunities for profits.

Private wholesalers play a major role in the distribution of rice and sorghum imported by the CPSP. Quotas are assigned by a committee headed by the Ministry of Commerce and prices are strictly regulated from wholesale to retail levels.

The Public Sector, Parastatals, and Cooperatives

The rules governing the role of public and parastatal entities and cooperatives in the marketing system have also been variable over time and sometimes imprecise. When ONCAD was abolished, the public sector role in the assembly of local millet, sorghum, and corn was passed to the Food Security Commissariat (CSA). Until 1984, the CSA was called the Food Aid Commissariat (CAA), due to its role as an aid distribution agency.

The public sector role in the assembly of locally produced hulled rice was given to the Price Stabilization Board (CPSP). This board is also responsible for commercial imports of rice and sorghum, and licensing of wheat imports. ONCAD's role vis-à-vis peanut assembly has gradually been shifted to the parastatal oil crushing firms. Rural development agencies have been given a role in corn assembly and a monopoly on producer-level assembly of paddy rice.

Cooperatives in Senegal have traditionally been government-directed organizations used to distribute production inputs, assemble cash crops, and recover debts. A 1983 reorganization of the cooperative system was aimed at broadening the scope of cooperative activities and increasing the degree of producer autonomy in their

management. A portion of the government grain purchasing target through official channels was set aside for cooperatives during the 1984/85 crop year. A preferential official price was also established to encourage cooperatives to use their own capital to assemble grain. Survey results indicate that this met with little success due to the overall level of official prices, timing of funds, the availability of grain, and other factors discussed below.

During the current marketing year, uncertainty has also influenced the role of public agencies in the assembly of grain. On October 8, 1984, the Ministerial Council announced that the official marketing season would begin on October 15. The official regulation specifying that the Food Security Commissariat (CSA) could purchase grain at the producer level was not signed until December 21, 1984. Thus, the legal basis for direct producer-level purchases by the CSA was unclear (since for 1983/84 the CSA was to purchase from private traders). The legality of producer-level purchases by private traders was also unclear. Nonetheless, both groups proceeded to assemble grain, although at prices that often differed considerably.

Prices

Prices are another area where regulatory uncertainty exists. As in many other countries, Senegal establishes "official" prices at the producer, wholesale, and retail level for locally produced grain (in this case millet, sorghum, corn, and paddy rice). Official wholesale and retail prices are also set for imported cereals. Government enforcement efforts make it clear that official prices for imported grain are intended to fix prices to consumers and margins permitted to intermediaries. It is not clear whether producer prices are intended as a floor or a fixed price for locally produced grain. During the 1983/84 season, the official price was treated as a floor price, and when market prices were above official prices, the CSA simply withdrew from the market. (CSA officials report that this was in part because funds were not available.) During the 1984/85 season, a number of cases of seizures by administrative authorities were reported during the early months of the "official" marketing season. These were for grain traded at higher than official prices (see Table 4).

This calls into question what government wants "official prices" to actually mean. Survey data collected in 40 rural markets (Figure 1) show that mean producer-level prices for millet paid by private traders in the Peanut Basin stayed above the official price (55 francs CFA/kg until October 1984 and 60 francs CFA/kg after that date) for the entire July 1984-February 1985 period. The lowest observed price offered fell below the official price during the harvest period only in the areas of highest

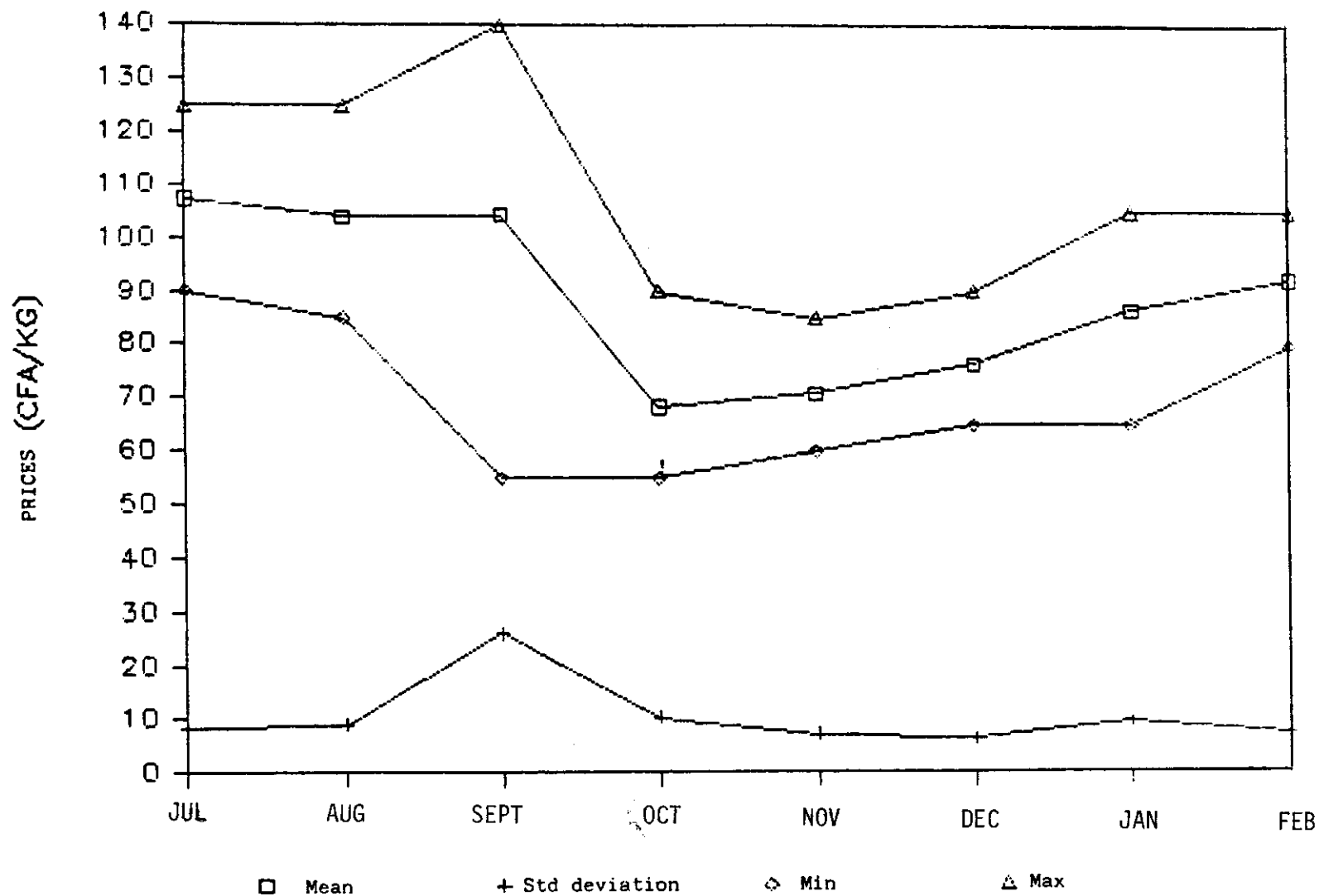
Table 4. 1984/85 Official Prices for Local and Imported Grain (FCFA/kg)

Level	Millet	Corn	Paddy Rice	Imported Rice ¹	
				Louga/ Kaolack	Dakar
Producer	60.0	60.0	66.0	-	-
Wholesaler	68.0	68.0	same as imported	149.6	147.8
Wholesale					
Outside Dakar	72.0	72.0	same as imported	155.4	
Dakar	73.0	73.0	same as imported		153.6
Retail					
Outside Dakar	78.0	78.0	same as imported	162.0	
Dakar	80.0	80.0	same as imported		160.0

¹ Imported rice prices were increased by 23 percent on January 12, 1985. Prior to that date, the retail price at Dakar was 130 FCFA/kg.

Source: Decret 84-1512, 21 December 1984 and Le Soleil, 12, 13 January 1985.

Figure 1. Producer-Level Millet Prices in Senegal's Peanut Basin
(July 1984 - February 1985)



Official price : 55 F CFA/kg through September, then 60 CFA/kg

SOURCE : Price surveys in 40 markets ISRA/BAME

production. Thus, while the official price may have functioned as a floor, it obviously did not act as a fixed price at which all cereals were exchanged. In terms of providing incentives to producers, this is no problem. But imprecision about the legal objective in setting official prices has resulted in other undesirable effects, in addition to the seizures. Foremost among these is that since legally permissible margins are established on the basis of official producer prices, private wholesalers often maintain accounting systems based on official prices at wholesale and retail levels even though no trades occur at those prices. This lets them appear to be in compliance with regulations and also trade grain. At best, this defeats the whole purpose of maintaining an accounting system. It also points out the usefulness of understanding some of the participants in the marketing system and the functions they perform in order to evaluate policy options.

How the Market Really Works

The Private Sector

The private sector grain trade in Senegal's Peanut Basin begins with a system of assemblers who purchase small (less than 50 kg) and larger (50-100 kg) quantities at the village and periodic market level. Bagged grain (80-130 kg) is generally assembled by

licensed and unlicensed wholesalers in periodic markets and handled in break bulk to move it to major regional centers. At these centers, it is sold for consumption, stored, or redistributed to grain deficit areas. Some bulking of grain also takes place in villages.

Survey data indicate that the private grain trade is very active despite the climate of regulatory uncertainty. The 1,400 market intermediaries identified in 40 of the most important assembly markets can be divided into two general categories--small assemblers and wholesalers.

Small assemblers include:

1. Day traders who, with an extremely limited capital base (often 10,000 FCFA or less), purchase small quantities of grain (3-15 kg) at a time. These traders often resell one sack of grain before beginning to assemble another. During the period immediately following harvest, volumes of 300-400 kg per day are not uncommon in areas where production is greatest. Quantities collected are generally resold to wholesalers before the end of the day.

Margins of 2.5-5 FCFA (1/2 to 1 cent U.S.) per kg are sometimes increased by imprecise weighing techniques.

2. Commission agents who assemble grain with money advanced by, or borrowed from larger traders, generally wholesalers. Their operating procedures are similar to those of day traders, but remuneration is on a flat daily fee or per sack basis, rather than a buy/sell margin.
3. Food deficit producers and non-producers who assemble grain in order to store for their own consumption later in the year.

Preliminary results of surveys of merchant operating procedures, reported in Table 8, indicate that 39 percent of assemblers surveyed store grain. This is generally for short periods necessary for stock turnover, except for those who store for home consumption and a few who speculate on interseasonal price variation. Grain was transported by 35 percent of those assemblers surveyed. Although precise results on distances transported are not yet available, they appear relatively short.

Financing of transactions by small assemblers is largely from personal funds or a mixture of personal funds and those from other merchants and relatives (Table 12). Of the 25 percent of small assemblers receiving funds from other merchants, one-third were relatives of the merchants. Use of bank credit for direct financing of small assemblers is negligible, although some bank credit to wholesalers may eventually reach the small assembler level.

Wholesalers

Wholesalers include both licensed and unlicensed traders handling a variety of mixes of locally produced and imported grain and highly variable volumes. Preliminary results of multiple visit surveys of 63 major wholesalers in the Peanut Basin provide interesting insights into private sector commercial activities in the grain trade (presented in Tables 5-15).

Of the wholesalers sampled, 58 percent were licensed, e.g., they had a "carte de grossiste." Of these, 72 percent also had a quota for selling imported rice. They made up 42 percent of the total sample. Preliminary indications are that wholesalers located in zones of greatest production specialize in locally produced grain, while wholesalers based in deficit regions are more likely to handle both local and imported grains. Wholesalers handling imported grains are most likely to be licensed. Much of the market outlet for local grain is being provided by unlicensed merchants. More detailed regional analyses are planned.

Table 5. Sales Volumes, Grain Wholesalers (Medians),
6 Months Post-Harvest, 1984/85

Crops Handled	Tons	Value		N
		Million FCFA	\$ (1,000)	
Millet "Specialists"	97	7.8	15.6	36
Rice "Specialists"	181	26.0	52.0	8
Millet + Rice	153	19.5	39.0	19

N.B. Data on other products handled by these traders have not yet been analyzed.

Table 6. Total Volumes Handled by Sample Wholesalers

	Tons	Value	
		Million FCFA	\$ (1,000)
Millet Purchases	9,337	722.6	1,443.2
Rice	4,686	674.0	1,348.1

Table 7. Total Grain Volumes, Official Channels, October 1984-March 1985

	National Tons	Peanut Basin Tons	B A % of National
<u>Mil</u>			
CSA Purchases (National)	1,752	981	56
Cooperatives	1,530	830	54
<u>Riz</u>			
CPSP Imports Distributed	141,755	29,757	21

Table 8. Grain Merchants Performing Storage and Transport Functions

	Assemblers (%)	Wholesalers (%)	Total (%)
Storage	39	79	57
Transport	35	46	40

Preliminary results based on 243 responses.

Table 9. Reported Length of Time Stored - Wholesalers

Less than one week	34%
One week to one month	48%
One month to three months	14%

Table 10. Wholesaler Storage Facilities

	Mean Capacity (MT)	Mean Monthly Cost (FCFA/MT)	Share
Rented	57.2 (72.7)	381 (272)	54%
Owned	93.5 (146.4)	240 (281)	42%
TOTAL	71.9 (110)	358 (271)	100%

Estimates are for building only; estimates for handling and capital are forthcoming.

Table 11. Grain Transportation by Wholesalers

	Mean	Standard Deviation
Distance (km)	111.8	93.4
Quantity (MT)	8.9	9.6
Cost/FCFA (MT/km)	65.6	53.5

TRANSPORTATION COST

$$1) \quad L_n \text{ PTKM} = 6.87 - .71 L_n \text{ DIST} \\ (.05)$$

$$R^2 = .81$$

$$F = 178 \quad P \quad .01$$

$$2) \quad L_n \text{ PTKM} = 6.59 - .60 L_n \text{ DIST} - .14 L_n \text{ QUANT} \\ (.05) \quad (.04)$$

$$R^2 = .86$$

$$F = 123 \quad P \quad .01$$

PTKM = Cost of shipping in CFA francs per MT/km

DIST = Distance shipped in km

QUANT = Quantity shipped (bagged) in metric tons

Table 12. Sources of Financing Used by Grain Traders

	Assemblers (%)	Wholesalers (%)	Total (%)
Own Funds	75	82	78
Relatives	17	8	13
Other Merchants	25	10	18
Banks	0	6	3

Columns do not total to 100 percent because multiple sources were identified by some respondents. Preliminary results are based on 243 responses.

Table 13. Grain Market Financing

Pre-Harvest Loans to Farmers

Assemblers	21%
Wholesalers	26%
TOTAL	24%

n = 243

Wholesalers' Credit to Individuals

Other Merchants	47%
Retailers	41%
Farmers	68%
Consumers	74%

n = 58

Table 14. Grain Market Regulation

Merchant Sources of Regulatory Information

Source	Percent Reporting
Radio	83
Other Merchants	52
Chamber of Commerce	24
Newspaper	21
A Specific Person	14
Other	64

Table 15. Regulatory Checks of Wholesalers, 1984/85

Agency	Mean Number of Controls Per Month
Economic Control	2.0
Customs	1.2
State Police	.4
Police	.2
Department of Natural Resources	.2
Others	.2
TOTAL	4.2

Source: Preliminary Results, ISRA/BAME Surveys.

The total estimated millet volume handled by our wholesaler sample during the six months from September 1984-March 1985 is 9,337 MT, valued at 722 million FCFA. The rice volume estimated for the sample during the same period was 4,686 MT. This compares with total national millet volume handled by the CSA of 1,752 MT and 29,758 MT of imported rice distributed to quota holders in the Peanut Basin by the CPSP during the period. (This latter figure underestimates total rice volume in the Peanut Basin since some of the 95,000 tons distributed in the Cap-Vert Region made their way into the Peanut Basin.)

The median wholesaler handling millet, but not imported rice, had a six-month volume of 97 MT, valued at 7.8 million FCFA. The median rice wholesaler, who did not handle millet, handled 181 metric tons, valued at 26 million FCFA during the period. For those wholesalers handling both rice and millet, the median volume was 153 MT valued at 19.5 million FCFA. Medians are reported because the distributions of sales volumes are positively skewed, making means less satisfactory measures of central tendency than medians.

Several observations can be made with respect to business volumes reported here. First, the sample wholesalers' millet volume in a limited region of the country was more than five-fold the volume assembled nationally by the CSA, the government agency charged with assuring a market outlet to producers. Part of this difference can be attributed to the fact that private traders offered prices that were significantly higher than official prices.

The exact share of total millet volume handled by the wholesaler sample has not yet been quantified. If it falls between 15 and 20 percent of the total, then total marketing of millet would be in the 45-65,000 ton range, including millet that is resold intraregionally. This would constitute marketing 13-17 percent of the total produced on a regional basis. Official estimates of 1984/85 millet production are 470,000 MT nationally and 369,000 for the regions of Kaolack, Fatick, Thies, Diourbel, and Louga which make up the Peanut Basin. These percentages are in line with past estimates of producer marketing of local cereals (Ndoye, 1984). If such figures hold on a national basis, total millet marketed for 1984/85 would fall in the 60-80,000 MT range, less than 15 percent of 1984 commercial imports.

Government's role in grain markets is generally specified in terms of assuring market outlets to producers at prices deemed "non-exploitive," and assuring "reasonably" priced, reliable supplies of food to consumers. At the same time, government often states a goal of assuring that margins obtained by intermediaries are not excessive.

In Senegal, as in many other countries, there are few reliable studies that evaluate margins. When government gets into the business of setting prices and thus margins, its policies have an impact on the willingness of producers to produce cereals, of traders to move grain between areas of "surplus" and deficit; as well as the choices that consumers make between local and imported grain. Survey results shed some light on the functions performed by private traders, how they are organized, and what they cost. The following discussion focuses on storage, transportation, financing, and regulation. After a description of functions performed, some preliminary comparisons are made with organization and functions performed by public, parastatal, and cooperative organizations.

Storage

Of the 243 merchants responding to our merchant transactions surveys, 39 percent of the assemblers and 79 percent of the wholesalers report that they store grain.

The more detailed wholesaler interviews indicate that most of those sampled (82 percent) attempt to turn grain over within one month of its purchase. Given the high opportunity cost of capital and its limited availability, it appears that many wholesalers seek rapid turnover and high volume rather than returns to storage. On the basis of prices observed across the Peanut Basin and preliminary estimates of marketing costs, wholesaler net margins average 5 FCFA/kg on transfers between areas of surplus and deficit during the same month. Meanwhile, net returns to storage are also about 5 FCFA/month. Thus, a merchant who is able to turn his stock over more rapidly than once per month can achieve a greater return to capital and management than by storing. One apparently standard procedure has been to turn volumes over rapidly soon after harvest (when volumes are high), and then to store beginning five or six months after harvest when volumes are lower and the "hungry season" approaches. Some traders indicate, however, that uncertainty over potential foreign aid, and their impacts on price, increase the risk of storing for speculative gains during the "soudure."

Nonetheless, 96 percent of the wholesalers in our sample rent or own storage facilities. Those owning facilities have mean storage capacity 60 percent greater (see Table 10) than those renting and mean monthly costs per ton estimated as 35 percent less (based on their storage facilities). These figures do not reflect storage costs for actual quantities stored, nor do they reflect handling and treatment costs, storage losses, or costs of capital. Estimates of government storage capacity costs in facilities of 1,000-2,000 tons (10-20 times greater than the mean private facility) are

considerably lower on a per ton basis (Hayward). However, low rates of capacity utilization limit the usefulness of such comparisons.

Estimates of private monthly storage capacity cost per metric ton were evaluated for economies of scale in a statistical sense. Results strongly support the hypothesis that capacity cost declines with volume. A double logarithmic function estimated using OLS yielded an elasticity coefficient of $-.56$. This implies that a 1 percent increase in capacity leads to a 0,56 percent decrease in cost per metric ton of capacity. Once again, these economies are only realized when capacity is fully utilized. Given probable excess capacity, further analysis based on capacity utilization and other storage costs will be conducted.

STORAGE CAPACITY COSTS

$$L_n \text{ CSTMT} = .56 - .56 L_n \text{ CAP} \\ (.07)$$

$$R^2 = .57$$

$$F = 72 \quad P \quad .01$$

CSTMT = Monthly storage cost per metric ton in 1000 francs CFA

CAP = Storage capacity in metric tons

Transportation

Almost one-half of the wholesalers interviewed indicate that they transport grain after purchase. Only 35 percent of small assemblers transport grain. Additionally, the distances transported by assemblers are generally shorter than those which wholesalers move grain.

The distances and costs of transportation reported by the 60 wholesalers (whose commercial activities were surveyed intensively) vary considerably. Still, the mean shipment, reported as the most recently occurring, involved shipping 8.9 tons of grain 111.8 km at a cost of 65.6 FCFA/ton/kilometer. This implies movements of grain over considerable distances despite an official price structure for locally produced grain which, if respected, permits the wholesaler the same gross margin regardless of whether he buys and resells in the same place or moves grain several hundred kilometers.

At the mean, reported transportation costs of 7,3 FCFA/kg represent 61 percent of the officially permitted producer-retailer margin in rural-to-rural sales. Official

prices are not respected, although at least some traders maintain accounting systems based on official prices in order to avoid difficulties with regulatory enforcement officials. Compared with the official price schedule for transportation costs used by the Food Security Commissariat (CSA), mean transportation costs reported by wholesalers are quite high. The price schedule provides for costs of 27 FCFA/ton/kilometer transportation along paved roads, 38 FCFA/ton/kilometer along improved dirt roads, and 49 FCFA/ton/kilometer on ordinary dirt roads.

Traders surveyed report that the price schedule has little or no impact on the prices they actually pay. A recent ISRA/BAME study of fertilizer distribution (Crawford et al. 1985) also found that transportation rates actually paid were considerably higher than the official rates.

Analysis of transportation costs using double logarithmic functions and OLS indicate economies associated with increasing distance and quantities. In the best two variable model, a 1 percent increase in distance was found to decrease cost per kilometric ton by 0.6 percent and a 1 percent increase in quantity shipped led to a 0.14 percent decrease in cost per ton kilometer. For shipments traveling farther more than 100 km, costs per kilometric ton are often lower than the official rates. Short distances are considerably more expensive, on a per metric ton basis.

Further analysis will break down shipments by commodity and route to further examine variability in transportation costs.

Financing

Providing a market outlet for local cereals and assuring supplies of local and imported grain to consumers requires considerable capital. The intensive survey of wholesalers yielded estimates of 1.5 billion FCFA in sales volume for 63 wholesalers during the six-month period, October 1984-March 1985. It is true that rapid inventory turnover permits large sales volumes with a smaller capital base. Still, if the inventories of the traders turned over five times during the period, at least 300 million FCFA would have been necessary to finance their initial purchases--about 5 million FCFA per wholesaler. In addition, capital is required for investments in storage, transportation, etc.

If government is to succeed in replacing imported cereals consumption with local cereals consumption, the volume of local cereals marketed must increase. If total millet marketed in 1984/85 is 80,000 tons, then five times more grain assembly would have to be financed in order to replace rice and sorghum imports.

Of course, some capital that is currently financing imported rice inventories could shift to purchase local grain. However, if grains are to become a cash crop, financing will have to be available at harvest to purchase and store grain. In contrast, financing of imports, delivered throughout the year, can be more spread out. The availability of the necessary capital over time will depend in part on the incentives provided by marketing systems policy.

Survey results indicate that wholesalers are even more reliant on their own funds to finance their operations than are small assemblers. Eight percent of wholesalers get at least some funding from relatives, 10 percent get some funds from other merchants, and 6 percent report some bank financing. Overall, 28 percent of wholesalers report using some borrowed capital in their operations. Senegal is a predominantly Moslem country, so the issue of payment of interest is extremely sensitive. Asked about the amount which a merchant would have to repay if he borrowed 100,000 francs for one month, responses indicate interest rates ranging from 0 to 25 percent per month, with a mean of 7.2 percent per month. This compares to an official bank prime interest rate of about 15 percent per annum, which is equivalent to 1.25 percent per month.

While an interest rate of 7.2 percent per month seems extremely high, preliminary analysis of data on other aspects of financing indicates that reimbursement rates are extremely variable, but often quite low. Wholesalers report that the number of loans made since harvest that had been reimbursed was in the 5 to 100 percent range, with a mean of 62 percent. While interest rates from private credit sources are quite high, given reimbursement problems, they may not necessarily lead to extremely high returns, when the need to recuperate funds lost through bad debts is considered.

Senegal's current economic hard times apparently place wholesalers in a situation where they cannot move grain without providing credit. Yet, when they provide credit, they have reimbursement problems. Survey results indicate that wholesalers are quite active in loans to other merchants, retailers, farmers, and consumers. At the same time, wholesalers indicate that they have little recourse if loans are not reimbursed.

Overall, the cost of capital for doing business and the opportunity cost of capital invested in the business are very important factors influencing the cost of marketing grain and where wholesalers invest their money. Assuming the cost of capital is accurately reflected by the mean figure reported above, financing the purchase of millet at the producer level (at the official price) costs 4.3 FCFA/kg/month. This is 36 percent of the officially prescribed margin. At the prime bank interest rate, the cost of financing is 0.8 FCFA/kg/month, or only 7 percent of the officially specified margin. Thus, the cost of capital can be a very important factor in determining marketing

margins necessary for the wholesaler to cover his or her costs. It is important to know that the above calculations include no allowances for the cost of capital invested in weighing equipment, storage facilities, transportation equipment, or office/sales space.

One of the requirements for licensing as a wholesaler (*carte de grossiste*) is that the applicant provide an "attestation" of a bank balance of 3 million francs on a one-time basis. Obviously, a significant financial capacity is necessary in order to function as a wholesaler. Nonetheless, the "attestation" does not serve as a guarantee that the wholesaler will be able to meet his financial obligations. It does, however, serve as a barrier to entry into the grain trade. Regulations for the 1984/85 marketing season require that merchants making farm-level purchases be licensed wholesalers. This necessitates the 3 million FCFA attestation even though many small assemblers purchase daily quantities of 100 kg or less, with a maximum value at official prices of 6,000 FCFA. The same holds true for transportation of 200 kg or more of local grain across regional boundaries--a wholesaler's license is required even though the value at official prices is 12,000 FCFA. Such barriers, if enforced effectively, would limit the available liquidity in the system and potential market outlets for farmers.

Regulation

Senegal and other governments are faced with evaluating the tasks in the marketing process to confer on the private sector and those to retain for itself. They want to perform marketing functions more efficiently or cost effectively without significantly compromising government objectives vis-a-vis producers, consumers, and the balance of payment. If marketing operations are performed more efficiently, it may be possible to achieve higher returns to producers and lower costs to consumers. At the same, the state may be unwilling to count on the unregulated private sector to share returns resulting from economies in operations with producers and consumers, rather than expropriating them. For this, and other reasons, the state maintains a regulatory system and watches over the marketing system.

As noted in 2.1 above and elsewhere (Sow and Newman, 1985), relatively late announcements of the "rules of the game" contribute to uncertainty in the grain marketing system. Overall, government regulation takes the broad form of specifying who may participate in grain marketing, under what conditions, when transactions may take place, prices at which transactions may take place, etc. Regulations specify quality in broad terms, but no specific grades for local grains are used in local markets.

Government regulations also take the form of checks of: wholesaler licenses, permits for moving grain or other products when required, accuracy of weighing

equipment, pesticides used, etc. Compliance with regulations is an important transaction cost for wholesalers. It takes time to find out about regulations, be checked for compliance, purchase permits and licenses, and pay potential fines. Working out "understandings" with regulatory officials is also a cost.

Survey results indicate that radio and other merchants are the most important sources of wholesaler information on what the rules actually are. Regulatory enforcement officials, local chambers of commerce, and newspapers were also listed as important information sources.

Wholesalers indicate that they have considerable contact with regulatory enforcement officials, and are checked an average of 4.2 times per month by a combination of economic control officials, customs agents, state and local police officials, Eaux et Forêts, and others.

There was not much difference between licensed and unlicensed merchants in terms of payment of "fines" to regulatory compliance officials. Of the wholesalers who reported paying "fines" during the 4-6 months after the 1984/85 harvest, 54 percent were licensed. In 35 percent of these cases, receipts were received for payment of "fines." In 65 percent of the cases, an "arrangement" was worked out. The total amount reported by the 60 wholesalers interviewed intensively was 460,000 FCFA, a mean per "fine" or arrangement of about 5,000 FCFA. Further analysis of the data will permit a more precise evaluation of the reasons for fines and other costs of regulatory compliance.

Since regulations are not made official until several months after the marketing season begins, it is very difficult for market participants to comply. The resulting uncertainty contributes to a climate conducive to ignoring of regulations and/or corruption of enforcement officials in order to keep the system running. The fines reported above represent only 0.04 percent of the estimated total sales volume of the traders, or 0.03 FCFA/kg of grain handled.

Nonetheless, this does not take into account the time spent on regulatory compliance by traders, and the marketing activities that do not take place because of fear of enforcement. For the state, regulatory enforcement represents a cost, and fines, if they enter the government treasury, help to offset the costs of enforcement.

In the final analysis, the key question must be whether the regulatory enforcement process supports government objectives that are its *raison d'être*. Some individuals are obviously able to work out "arrangements" and conduct business as they wish. At the same time, the time and resources required to work out such

"arrangements" may constitute a barrier to entry for traders who wish to begin or expand their activities.

Further analysis of the process by which regulations are established, information about regulations is disseminated, and regulations are enforced can contribute to the government's ability to assure that the regulatory environment supports the overall objectives of the New Agricultural Policy.

Overall Performance, Prices, and Margins

The preliminary survey results presented here indicate that the private wholesale trade is playing an important role in meeting government goals of providing market outlets to grain producers and assuring supplies of grain to consumers in deficit areas. While consumers in deficit areas with the ability to pay are able to purchase grain, the official pricing system provides an incentive for them to purchase imported rather than local cereals. If official prices/margins for local cereals were actually enforced, there would be no incentive for local cereals to move to deficit areas. At the same time, transportation subsidies for imported cereals provide an incentive for private traders to let the CPSP move grain to them rather than moving it themselves.

Overall, survey results indicate that for local cereals, officially specified margins do not cover costs of assembly, transportation, storage, and financing for an average trader (see Tables 16 - 18). Preliminary data analysis indicates considerable variability of costs, and economies of scale in storage and transportation. But, it is not possible on the basis of preliminary analysis to identify the categories of wholesalers for whom the official margins potentially cover costs and those for whom they would not. Nonetheless, the budgets that follow analyze costs and returns for several scenarios.

The Public Sector, Parastatals, and Cooperatives

The institutions involved in public sector grain marketing were introduced above. The public sector role during the 1984/85 marketing season included: distribution of imported rice and sorghum through a system of licensed wholesalers and assembly of local millet, corn, cowpeas, and paddy rice through the CSA and the Regional Development Agencies. Assembly of peanuts was handled by the parastatal oil crushing firms through cooperatives in competition with thriving parallel market trade.

Local Millet, Corn, and Cowpeas

The Food Security Commissariat (CSA) established assembly targets of 40,000 tons of local grain purchases for the 1984/85 marketing season, including 32,000 MT of

Table 16. Rice Marketing Margins, Sale at Louga or Kaolack

	Official Prices Pick Up At:	
	Louga/Kaolack	Dakar
Purchase Price (kg)	149.6	147.8
Resale Price	155.4	155.4
GROSS MARGIN	5.8	7.5
Transport to Kaolack/Louga	0.0	5.4
Storage	0.3	0.3
Handling	0.7	0.7
Cost of Capital	1.8	1.9
Regulatory Fees, Taxes, etc.		
TOTAL COSTS	2.8	8.3
NET MARGIN	2.9	-0.7

Table 17. Millet Marketing Margins, Purchased at Ndiba (Kaolack)--
3 Months Storage, Resale at Louga, FCFA/kg

	Official Prices	Oct. 1984 Prices	Jan. 1985 Prices
Purchase Price (kg)	60.0	63.0	80.0
Resale Price	72.0	83.0	105.0
GROSS MARGIN	12.0	20.0	25.0
Assembly Costs	3.7	3.7	3.7
Transport to Kaolack	1.8	3.5	3.5
Storage	0.1	0.1	0.1
Handling	0.7	0.7	0.7
Cost of Capital	2.4	2.6	3.2
Transport to Louga	5.1	5.1	5.1
Regulatory Fees, Taxes, etc.			
TOTAL COSTS	14.0	15.8	16.4
NET MARGIN	-2.0	4.1	8.5

Transport at price schedule, capital at 15 percent per annum.

Table 18. Millet Marketing Margins, Purchased at Ndiba (Kaolack)--
3 Months Storage, Resale at Louga, FCFA/kg

	Official Prices	Oct. 1984 Prices	Jan. 1985 Prices
Purchase Price (kg)	60.0	63.0	80.0
Resale Price	72.0	83.0	105.0
GROSS MARGIN	12.0	20.0	25.0
Assembly Costs	3.7	3.7	3.7
Transport to Kaolack	1.8	3.5	3.5
Storage	0.1	0.1	0.1
Handling	0.7	0.7	0.7
Cost of Capital	14.2	15.2	18.8
Transport to Louga	5.1	5.1	5.1
Regulatory Fees, Taxes, etc.			
TOTAL COSTS	25.7	28.4	32.0
NET MARGIN	-13.7	-8.4	-7.0

Transport at price schedule, capital at 7.2 percent per month.

millet, 7,500 tons of corn, and 500 tons of cowpeas. The objectives specified in setting the targets were to permit sales to millers and development of industrial processing of local grain; and to permit cash sales and free distribution in deficit areas. Assembly was to be conducted directly by the CSA at its warehouses and in periodic markets (30 percent), through cooperative organizations (50 percent), and rural development agencies. Official producer prices announced in October represented a 9 percent increase above those for the previous year for millet and cowpeas and an 18 percent increase for corn. Still, market prices were almost universally below prices offered by private traders in the Peanut Basin (see Figure 1).

The total quantity of millet actually purchased by the CSA during 1984/85 was 1,753 MT nationally and 981 tons in the Peanut Basin, approximately 5.5 percent of the target. Nationally, 499 tons of corn were collected by rural development agencies. No cowpeas were purchased. Official statistics indicate that 87 percent of the millet assembled nationally and 85 percent from the Peanut Basin passed through cooperative organizations.

Surveys of cooperative organizations indicate that in some cases the availability of funds provided by the CSA helped to put a floor under prices. Nonetheless, 16 percent of the 50 cooperatives surveyed indicate that one way that they assembled grain, despite low official prices, was to give cash advances to farmers, who later reimbursed with grain. Fourteen percent of the cooperative organizations report that they provided cash advances to traders in local markets and then purchased the grain that was assembled at the official price. Twenty-six percent of the cooperatives report that some of the grain that they assembled was purchased in local markets. The actual price received by producers in the latter cases was sometimes lower than the official price. Cooperative presidents interviewed indicate that they would have been able to purchase more grain if funds had been available earlier. Twenty-three percent of cooperatives had funds by the end of October and 70 percent by the middle of November.

If the government's objective were to have outlets available at which producers could receive the official price as a floor price, then the CSA's failure to achieve its assembly targets should be evaluated as a success. If (a) announced early enough to influence production decisions, and (b) funds are available when people want to sell, the floor price can serve as insurance to producers, while allowing supply and demand to provide a further incentive to increase production, if warranted.

On the other hand, the CSA obviously fell short of its stated objective of contributing to the development of industrial processing of local grain and government grain sales. Furthermore, uncertainty as to the legality of producer sales to private

traders at higher than official prices led to confusion among producers, traders, and regulatory and administrative officials. The extreme case was an announcement in several parts of one region that private trade in grain was illegal and police were sent to markets to halt it. As noted above, the need for appearances of regulatory compliance has led to fictitious bookkeeping. It has also led to corruption and behavior in apparent contradiction with official goals as market participants seek ways to minimize transaction costs and continue to function within the existing system.

Local Rice

One element of the government of Senegal's push toward food self-reliance is the development of irrigated agriculture. Rice is an important crop in the former region of the Casamance (regions of Ziguinchor and Kolda) and increasingly in the Senegal River Valley (formerly Fleuve, now region of St-Louis). While the Casamance has often been talked of as the granary of Senegal, the region is now a net rice importer (Jolly, Kamuanga, Sall, and Posner, 1985). Rice production in the Senegal River Valley has increased markedly in the last five years, to an estimated 79,000 tons in 1984/85. Rice assembly at the producer level is officially a monopoly of the Regional Development Agencies (RDAS), (SAED in the Fleuve, SOMIVAC and SODAGRI in the Casamance). The RDAS are supposed to mill the paddy rice collected from producers and resell it to the CPSP, which in turn distributes it along with imported rice.

The reality of the 1984 marketing season supports Timmer's (1984) statement that while getting prices "right" may not be necessary, getting prices wrong can be devastating to the pursuit of government's policy objectives. The producer price of paddy rice was fixed by the government at 66 FCFA/kg in October 1984, before the November/December harvest. At that time, the Dakar-based retail price of imported milled rice was 130 FCFA/kg, with prices as high as 139 FCFA in areas farthest from Dakar.

In January 1985, the official retail price of imported rice was increased 23 percent to 160-169 FCFA/kg, while the producer price of paddy rice remained the same. As a result, a thriving parallel trade and small-scale milling industry developed rapidly. In the Fleuve, the quantity of paddy rice marketed by SAED, the RDA, fell 35 percent from 25,000 to 14,300 tons, despite a significant increase in the crop (Morris, 1985). Throughout much of the northern Peanut Basin, local rice traded on the parallel market has provided strong competition for imported rice. Morris has documented that small private mills, 64 percent of which have been installed during the last 18 months, are now processing 250 percent of the monthly volume handled by SAED mills during

the peak season. Thus, price policy has stimulated parallel market development, in part because policy decisions did not take into account the interrelated nature of raw agricultural products and their processed outputs.

A similar situation occurred with peanuts during the 1984/85 agricultural season. In mid-1984, the consumer price of peanut oil and other vegetable oil was increased. Producers discovered that it became increasingly profitable to crush peanuts by artisanal methods rather than selling in the shell at the prevailing cash price. As a result of a shift in the relative official prices of raw product and output, as well as parallel market prices for peanuts in the shell, the country experienced a severe decline in official marketings and the parastatal oil firms were left with considerable excess capacity.

Imported Rice and Sorghum

Imported rice is distributed through a system of private quota holders and a parastatal wholesaler/retailer (SONADIS). Monthly quotas are allotted to licensed wholesalers on a quarterly basis. In theory, all sales are for cash, although the CPSP figures show some outstanding credit sales. The CPSP prepares the tenders for rice imports, takes delivery of the commodity, and then distributes it to wholesalers. As noted above, rice prices reflect a part of the transportation cost differentials from Dakar, although not entirely. Thus, it often pays for wholesalers to receive delivery of their quotas outside of Dakar, unless quality differences can justify the added cost of transport from Dakar.

Retail rice prices are rather closely supervised, and relatively stable compared to prices for locally produced cereals. The combination of assured prices and assured supplies has contributed to increased rice consumption, even in rural areas. Transportation of imported rice at official prices necessitates subsidies estimated at 1 billion FCFA in 1984 (Borsdorf, 1984, p. 8). The official price structure for local grain keeps the price relatively low. This is not an incentive to consumption, however, because neither producers nor traders are willing to supply grain at official prices.

Local grain could not compete if government were successful in enforcing its official price for local cereals unless there were subsidies. Transportation and storage costs would have to be borne by someone.

While government policy of subsidized rice transportation contributes to assuring supplies to rural areas, it works against government objectives of increased production and consumption of local cereals. The dilemma is a difficult one: higher rural grain prices and irregular supplies increase incentives for rural-to-urban migration. At the

same time, assured supplies of imported grain to rural areas at subsidized prices result in a relative disincentive to production and consumption of local grain. These and other issues are discussed further in the conclusions which follow.

CONCLUSIONS: MARKET POLICY, PRICES, AND TRADEOFFS BETWEEN LOCAL AND IMPORTED GRAIN

One of the central objectives of Senegal's food and agriculture policy is to increase the degree of self-reliance in grain production, substituting locally produced millet, corn, and rice for imported rice, wheat, and sorghum (Diop, 1984, 1985; Diouf, 1985). On the demand side, increased consumption of local grain will be strongly influenced by availability of sufficient supplies of consistent quality at a price that is competitive with those of imported grain.

On the supply side, replacing part of the 500,000 MT of grain imported annually will require that local grain crops become cash crops, on the same basis as peanuts and cotton.

The foregoing analysis of Senegal's marketing system helps one understand key issue areas and decisions linking marketing system policy and the tradeoffs between locally produced and imported grain. Some of the policy choices that need to be made are obviously more difficult than others; several are discussed in a preliminary fashion below.

Defining Appropriate Public, Parastatal, and Private Sector Roles in the Marketing System

Senegal, and many other West African nations, approach marketing and agricultural policy from a long history of government planning and state intervention (Berg, 1979; Blandford; CILSS, 1979; Ouedraogo, 1983; Wilcock, 1978). The "conventional wisdom" commonly accepted by Sahelian governments is based on notions of an exploitive private sector from which producers and consumers must be protected. Yet, increasing reliance on the private sector is becoming a central theme as many African governments seek adjustment to the current economic crisis. There is limited empirical evidence and sound economic analysis, however, upon which to base the choice of activities to be turned over to the private sector and those to reserve for the state or parastatal agencies. Even economists have failed to agree on just what past empirical studies actually show (Jones 1972; Harriss). As a result, choices have often been based on ideology and conventional wisdom, rather than an in-depth analysis of the implications of different policy options for different groups and interests. We have

found an active private and sometimes parallel market in grain that is moving considerable quantities of grain between producers and consumers. The market is largely internally financed. Marketing costs and margins, while different from those specified in official texts, do not seem extremely large. At the same time, an unnecessary degree of uncertainty may lead to underinvestment in the system and necessitate larger returns than might otherwise be the case.

Deciding the "Rules of the Game" in a Timely Fashion and Playing by Them

Some uncertainty in the marketing system is normal. At the same time, policy makers can decrease uncertainty by announcing the requirements to participate in the marketing system early enough to have an impact. Regulations issued 3-4 months after harvest have little positive effect on the marketing process, but contribute to uncertainty concerning what is legal, who may purchase, transport, and sell grain, etc.

Regulations should also take into account the necessities of trade. If grain is assembled in small quantities valued at several thousand francs CFA, there is no need to limit assembly to licensed wholesalers able to demonstrate a three million franc bank balance. At the same time, if large transactions based on credit are to be conducted by wholesalers, some sort of security for those who extend the credit may facilitate the operation of the system.

Considering Carrots Instead of Sticks: Using Government Policy to Provide Incentives

If government wants grain stored and moved between areas of surplus and deficit, it must take the costs upon itself or provide incentives to others.

Regulatory policy is often viewed as a way to force those who are regulated to comply. Often, the same goals can be achieved by providing incentives which make it in the self-interest of the regulated to act in accordance with government agricultural policy objectives.

For example, if government wants to assure that supplies of local grain are available during the hungry season ("soudure"), it could purchase grain, store it, resell it, and take responsibility for determining administratively what quantities to purchase, what to resell, where, at what prices, etc. At the same time, sales by the private trade could be strictly regulated, with prices specified to remain the same across time and space, as they are supposed to be now. In this case, government would pay for assembly, storage, transportation, distribution, and regulatory enforcement.

An alternative scenario would have government investing in the capacity to monitor food availability and prices accurately and allow traders, farmer organizations, and others to purchase grain at a minimum floor price or above and resell at prices within a band, up to a ceiling price to be determined on the basis of marketing and storage costs.

Public or parastatal agencies could finance purchases if prices fell below the floor. At the same time, distribution of imported grain could be used for market regulation, decreasing imports when local grain is abundant and increasing imports when shortages are forecast. The objective would be to stabilize prices, but not to eliminate the variation in prices necessary to make it worthwhile for those other than the government to store.

A System Approach to Policies Vis-a-vis Local and Imported Grain

As the discussion above indicates, it is important to link policies for imported and locally produced cereals. Substitution exists, although accurate estimates of elasticities and cross-elasticities are not readily available (Kramer).

An improved understanding of the marketing system for local cereals is one critical element required for linking such policies.

At the same time, understanding the system does not eliminate the problem of "hard choices" that have to be made when policy choices are competitive. Assuring high prices to producers and low prices to consumers will always require that policy makers find some way to pay for the difference. The same grain cannot be used at the same time to develop processing industries, build grain reserves, and feed food deficit areas.

Cooperative organizations cannot be made both more self-reliant and essentially agents of the parastatal oil crushing firms. It is easier to escape the reality of such conflicts when goals are stated in broad terms. When it comes time to implement, choices are made, either directly or indirectly. The research results presented here were developed on the premise that improved understanding of how the system actually works can facilitate evaluation of policy options when the time for implementation arrives.

APPENDIX 1

STUDY PROCEDURES

In the absence of reliable data on the organization, operation, and performance of the grain marketing system in Senegal, ISRA's Macro-economic Analysis Bureau (BAME) has undertaken a series of regional research programs on grain marketing in the Peanut Basin (regions of Kaolack, Fatick, Thies, Diourbel, and Louga), Senegal River Valley (region of St. Louis), and lower and middle Casamance (regions of Ziguinchor and Kolda). Each program contributes to research on overall national cereals policy issues and options.

The overall objective of the BAME grain marketing studies is to provide decision makers with improved information with which to evaluate food and agricultural policy options. Special emphasis is placed on describing and evaluating private and public sector activities in markets for local and imported cereals (Newman, Ndoye, and Faye).

The data base on grain flows, grain market participants, and actual prices at which grain is exchanged in rural areas is extremely weak in the Peanut Basin and the rest of Senegal. A limited literature does exist, and has been reviewed as part of this project (Ndoye, Sow and Newman, 1984). However, it is primarily composed of village studies in limited geographic areas or macro-analyses based on aggregate statistics.

Field work for the Peanut Basin study began with exploratory surveys at the farm, village, and periodic market level in late 1983 and early 1984. Given limited resources and the desire to capture interregional transactions between areas of "surplus" and deficit, the decision was made to focus the survey work on periodic markets. Periodic markets generally meet weekly, except in urban areas where the frequency is often daily.

According to the literature, many, but not all, grain transactions take place in periodic markets (Ndoye, 1984). At the same time, it was decided to collaborate as much as possible with the farm and village studies of ISRA's Peanut Basin farming systems research team, located in Kaolack, to gain a perspective on grain marketing questions that can best be approached from the farm level.

Availability of a list of periodic markets to serve as a sampling frame proved to be the first hurdle. The number of periodic markets has apparently increased markedly during the last decade, especially in the regions of Kaolack and Fatick, which are the major assembly areas for grain in the Peanut Basin. Because periodic markets are generally regulated by administrative authorities, a census was undertaken based on contacts at the sous-prefecture level and interviews with a variety of informants. Over

200 markets were identified. This was completed in April 1984 and followed by a series of market verification surveys, where more detailed data on product flows, inter-market linkages, and infrastructure were collected. This was the basis for selection of 40 primary assembly and distribution markets on which the study focuses.

In order to permit selection of a representative sample of grain traders, a census of small-scale assemblers and wholesalers was conducted in each of the 40 primary assembly markets soon after the millet harvest. Approximately 1,400 intermediaries were identified.

The intermediary census served as the basis for selection of a stratified random sample of wholesalers and assemblers in 34 markets. Surveys of "intermediary transactions"--products handled, purchase and sales volumes, transportation, storage, financing, and information links--were begun after the 1984 millet harvest. Approximately 240 usable questionnaires were completed. A team of seven interviewers, including two supervisors, conducted these and later surveys.

Interviewers worked out of Kebemer, Bambey, Touba, Kaffrine, Kaolack, Niore du Rip, and Fatick. Questionnaires were written in French and translated into Wolof and Serere for actual interviews. Considerable time during pre-tests was devoted to translation of phrases and concepts into local languages.

Concurrently, surveys of "producer transactions" were begun in the same set of markets. Data on grain sales and purchases, choice of market outlets, and sources of market information were collected from a stratified sample of the same markets selected by quota, according to sales volume and sex.

More detailed data on wholesaler marketing activities, costs, margins, sales volumes, and seasonal variations were collected through multiple interviews with a sample of 63 wholesalers as a follow-up to the "intermediary transactions" survey. This survey focused on storage, transportation, financial arrangements, and commercial regulation and its enforcement.

Additionally, prices of local and imported grain (millet, corn, sorghum, rice), peanuts, and a variety of other agricultural products were collected on a regular basis in the markets in which the other surveys were conducted.

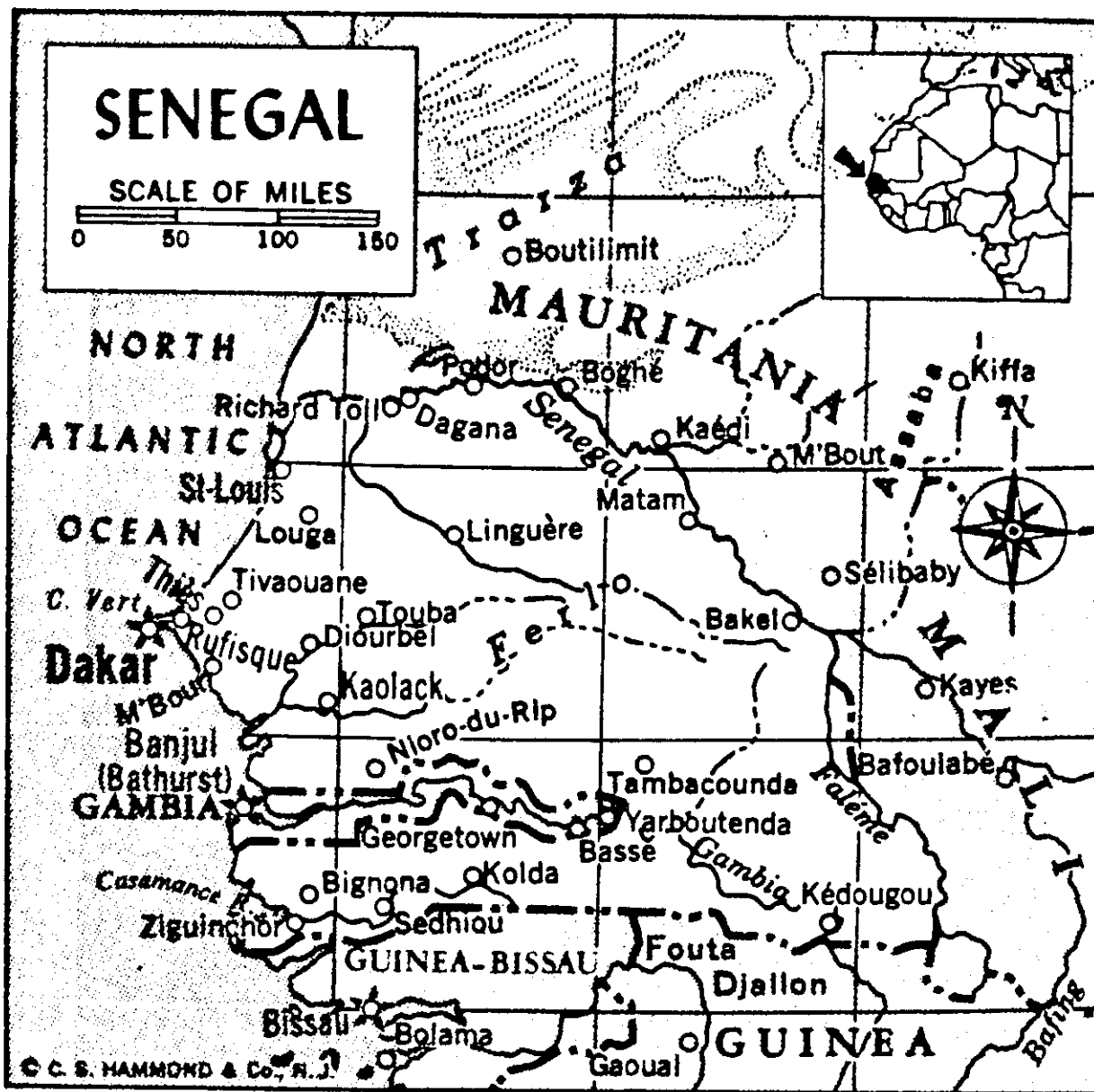
Information and data on public and parastatal marketing activities and policies were obtained through interviews with personnel of the Food Security Commissariat (CSA), Price Stabilization Agency (CPSP), and representatives of a variety of ministries (Commerce, Rural Development, Equipment, Plan, Finance, etc.) and rural development agencies.

Data on the role of cooperatives and village sections in the assembly of grain and peanuts were collected through surveys of a sample of 60 cooperatives and sections identified as official assembly points.

Those participating in the research program include: Mark Newman, Ousseynou Ndoye, P. Alassane Sow, researchers; Babacar Faye, senior technician; Mor Fall, Amadou Ndiaye, supervisory interviewers; Iba Mall, Moustapha Gaye, Emile Sene, Ousmane Ndao, and P. Ibrahima Fall, interviewers. Mamadou Sidibé assisted with data analysis and Mme Soukeynatou Some works with the team as typist/data processor.

GRAIN MARKETING SURVEYS
ISRA/BAME

SURVEYS	1983				1984					1985															
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May				
1. Exploratory Surveys/ Pre Tests	_____																								
2. Periodic Markey Census					_____																				
3. Markey surveys verification of central assembly markets							_____																		
4. Merchant census													_____												
5. Merchant trans- actions surveys															_____										
6. Farmer trans- action survey														_____											
7. Wholesaler commer- cial activities																	_____								
8. Cooperatives/Vill- age Sections																			_____						
9. Public/parastatal agencies CPSP, CSA																									
10. Agricultural price surveys					-----																				



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