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**CILSS**  
**CLUB DU SAHEL**  
**Working Group on Marketing,**  
**Price Policy and Storage**

**MARKETING, PRICE POLICY AND**  
**STORAGE OF FOOD GRAINS**  
**IN THE SAHEL**  
A SURVEY

**Volume II: Country Studies**

Submitted by

CENTER FOR RESEARCH ON ECONOMIC DEVELOPMENT  
UNIVERSITY OF MICHIGAN

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## ERRATA

## Chad

- p. 2 line 5  
 p. 16 footnote 1, line 6  
 p. 30 line 15  
 p. 32 bottom of table  
 p. 47 footnote 1  
 p. 48 line 3  
 p. 51 Table IX, line 3  
 p. 56 line 23  
 p. 56 line 25  
 p. 58 line 4  
 p. 60 footnote 1, line 5  
 p. 61 line 9  
 p. 80 line 22  
 p. 84 Appendix 5, ONDR

However, imports of wheat and flour...  
 ...must be less than for the rural areas.  
 Its monetary costs on this operation  
 year under each section should read, in  
 order: 1973, 1974, 1975, 1976  
 Conseil Militaire Supérieur.  
 (See Appendix 2)  
 "official" producer price 45 12(13.95) 45 ...  
 (See Appendix Table 7B)  
 (See Table XIV)  
 ...products, price increases for millet have...  
 See Appendix Table 8...  
 Handling, protection  
 ...ONDR has...  
 Mr. S. Souillanriba, Director of Extension Services

## Ihm. Gambia

- p. 13 line 13  
 p. 17 line 10  
 p. 73 line 10  
 p. 75 Table 4, line 2

... yields per acre from 1000 to 1500 lbs.  
 ...which will utilize modern inputs and reach, during  
 ...in June or July.  
unsubsidized price

## Mali

- p. 6 line 15  
 p. 10 line 16  
 p. 10 line 17  
 p. 14 line 12  
 p. 43 Table XLX  
 p. 51 line 16  
 p. 68 line 19  
 p. 69 line 8  
 p. 84 footnote 1  
 p. 100 line 20

...Mopti and the bottom-land  
 There are three prices...  
 ...parboiled whole rice. (See Diagram 1)  
 ...to a price schedule (French: barème)  
 table heading should read: Monetary Costs Return per workday  
 These credit bills are rediscounted at the Banque...  
 ...two channels: one private and one official.  
 ...has been distorted.  
 ...p. 84.  
 ...cases, the lack of adequate...

## Niger

- p. 9 footnote 1  
 p. 11 footnote 3, line 2  
 p. 15 line 16  
 p. 16 line 12  
 p. 17 line 5  
 p. 29 line 5  
 p. 39 line 18  
 p. 45 lines 17, 18  
 p. 46-48 Table IV  
 p. 59 line 1  
 p. 62 line 19  
 p. 75 line 19  
 p. 120 line 2 after Table 2  
 p. 121 line 2 after Table 4  
 p. 126 Glossary

FAC..., the French foreign assistance agency  
 ...illustrates. During the team's visit...  
 ...than twice the figure of 2000 CFA/ton...  
 ...of the 2000 CFA/ton reported...  
 ... (see page 15).  
 The commission to UNCC has been raised from 1100  
 CFA/ton in 1975/76 to 1500 CFA/ton in 1976/77.  
 Of interest is only r, the coefficient of correlation  
 ((Cov. (AB)/[Var. (A) \* Var. (B)]<sup>1/2</sup>)  
 the unit of measurement should read CFA/ton-km.  
 should be Table VI  
 ...the problem but there are...  
 (see page 56)  
 (see Appendix Table 10)  
 ...cooperatives buy the paddy from...  
 ...which it buys at 38 CFA/kg...  
 add: SMN Société National des Transports Nigériens,  
 National Transportation Company

## Senegal

- p. 17 footnote 1  
 p. 20 line 20  
 p. 27 line 20  
 p. 30 line 15  
 p. 39 line 26  
 p. 48 diagram  
 p. 49 line 22

This is true at any realistic...  
 ... as well as by country of origin,...  
 BUD is a private enterprise.  
 ...for first quality grain cotton...  
 ...there are 13 wholesale depots.  
 broken arrow should appear between "Approved  
 Wholesaler" and "Trader"  
 ...due to the small volume of these purchases.

## UPPER VOLTA

- p. 69 line 9  
 p. 94 line 20

...these are matters...  
 ...a correlation coefficient ( $r = \text{Cov}(AB) / [\text{Var}(A)]$ )

## Preface to Volume II

Because some readers of this volume may not have access to Volume I, it is worth repeating here some of the remarks made in the general introduction to the study. The study originated at the request of CILSS/Club du Sahel Working Group on Grain Marketing, Price Policy and Storage. At its Dakar meeting in July, 1976, the Working Group requested that a "diagnostic survey" be undertaken, in order to bring together existing information on marketing, price and storage, and to identify main issues. This study was undertaken in response to that request. It was financed by the Sahel Development Program of the Agency for International Development.

The country studies in this volume are based on field trips, on the study of documents and reports gathered in the field as well as from multilateral and bilateral aid agencies, on a survey of published literature and on responses to questionnaires sent to the CILSS countries in August, 1976.

The field trips took place between November 1976 and February 1977. At least three work-weeks were spent in each country; in most cases, it was closer to a month. During the ensuing write-up in Ann Arbor, the team benefitted from the presence, for brief periods, of the President of the Working Group, M. Ibrahima Sy; the Rapporteur of the Group, M. Charles Leroy; and M. Serge Michailof of the Caisse Centrale de Coopération Economique, Paris. Also, the final report benefits from a review of preliminary findings, held during a Working Group meeting in Brussels, March 16-18, 1977.

Considerable autonomy has been given to the authors of the country studies. They, of course, had guidance of several sorts. The terms of reference set down a long list of specific questions about which information was to be sought. The entire team spent some 10 days together in the Upper Volta, and three of the four authors of country studies went to Niger together. In Niger, a more detailed set of analytic questions was worked out, and this was used to guide the inquiry in the remaining field work. In Ann Arbor, we have had much discussion, and each draft country study underwent extensive editing.

It nonetheless remains true that each country study is the responsibility of its author, and will reflect his perceptions and ideas to a considerable extent. Such a devolution of responsibility seemed desirable for several reasons. (a) The field work could only be organized by specializing individual team members in given countries; it would have been too difficult for any one or two individuals to visit all seven Sahel countries. (b) Attribution of individual responsibility has obvious positive effects on the authors' incentives. (c) Perhaps most important, the study of marketing systems is peculiarly subject to the preconceptions of the investigator. It therefore seemed preferable, as well as necessary, to allow each country study to reflect its author's understanding and insight, which is to say, also his biases. This has resulted in differences of emphasis and outlook in the country studies--differences which are

accounted for also by the fact that marketing and price policy problems arise in different contexts in each of the Sahel countries.

The authors responsible for the country studies are: Boubacar Bah, Mali and Mauritania; Elliot Berg, Upper Volta; Daniel Kohler, Niger and Chad; Clark Ross, Senegal and the Gambia. In addition to overall editing by me, Aimée Ergas made major editorial contributions, Judy Brooks assisted on the Upper Volta, Charles Steedman worked on Mali and Mauritania, and Annick Morris was responsible for the French translations. Greg Conboy and Bijan Amini helped with statistical material.

The major emphasis in all the country studies in this volume is on marketing and price policy. Each study discusses storage issues, but these receive less intensive attention than marketing and prices. The reason is that we were originally requested to survey only marketing and price policy; storage was to be the responsibility of another group of consultants. For various reasons the Club Working Group was not able to find storage consultants, so we did some work on storage, but necessarily gave it less attention than the other issues.

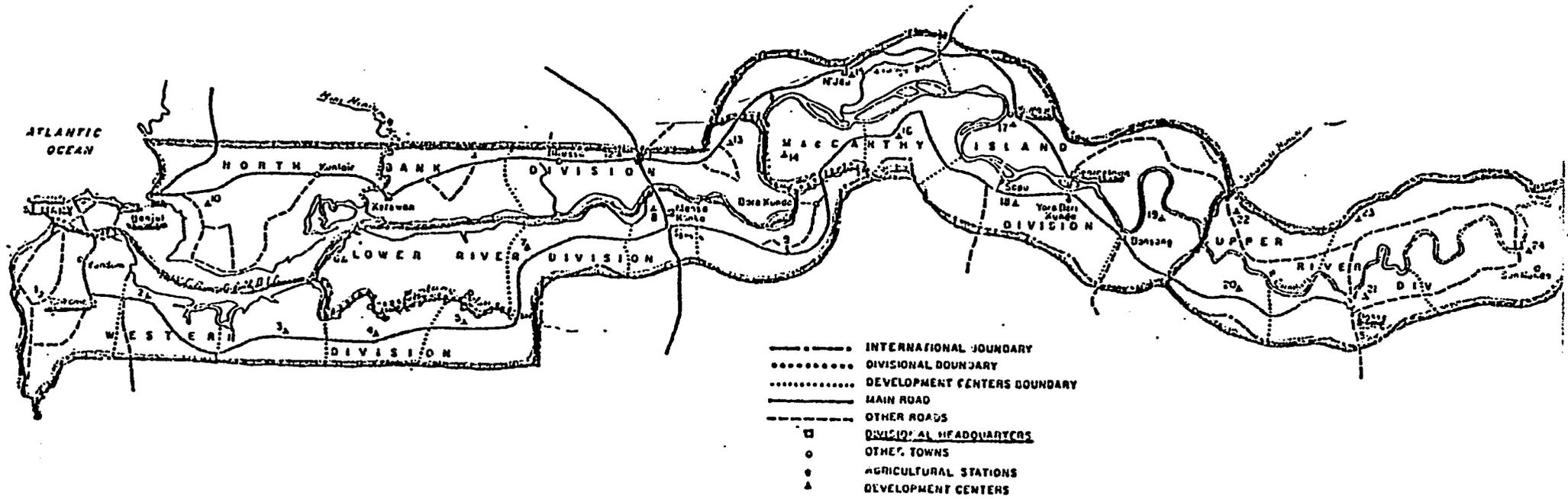
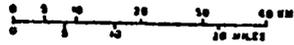
Finally, this is an étude diagnostique, a phrase for which there is no good English translation. It means an analytic survey, but without recommendations on policy. Authors of country studies were instructed to avoid drawing policy conclusions, but the line between assessment of options and recommendations on policy is difficult to draw. The basic purpose of these studies, in line with the mandate we were given by the Working Group, is nonetheless fact-finding: bringing together what is known, underscoring what needs to be known for more effective policy-making, setting out options and assessing these options in the light of existing constraints. The reader will therefore not find here detailed and specific recommendations on what grain marketing agencies such as ONCAD or OPVN ought to do, how they might be made more effective organizationally, whether and by how much millet and sorghum prices in Mali or Niger ought to be raised. These are the kinds of questions appropriate to more focussed policy studies, not to an étude diagnostique such as we were requested to do.

Elliot Berg  
Project Director

Ann Arbor, Michigan  
July 1977

**THE GAMBIA**

# THE GAMBIA



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## I. INTRODUCTION

The Gambia, a small but heavily populated country, is surrounded on three sides by Senegal. Approximately 500,000 people occupy 10,400 km<sup>2</sup> of territory, which is divided by the Gambia River flowing the length of the territory. The economy is heavily agricultural; the agricultural sector accounts for 50 percent of GNP and the total rural sector accounts for 60 percent. The GNP in 1975 was 184.6 million Dalasis or about \$111 million, which is equivalent to a GNP per capita of \$200. Almost one third of GNP is directly attributable to groundnut production. This very intensive specialization in groundnut production has been at the expense of other agricultural crops, primarily food grains. The result is that Gambia currently depends on external sources (commercial imports and international food assistance) for more than one third of its annual grain needs.

The stated policy of the government is to encourage a more diversified economy and, with reference to agriculture, to increase the local production of millet, sorghum and rice. The continued specialization in groundnut production, with the corresponding food grain imports, is a strategy with some risk, the success of which depends on the international price ratio of groundnuts to cereal grains. From the Gambian perspective, an adverse change in that price ratio would entail obvious economic costs.

The likelihood of such an adverse change is a critical factor in determining the optimum rate at which the Gambia may wish to move toward self-sufficiency in food grains. This overall question of the possible trade-offs between the Gambia's continuing specialization in groundnut exports and increased domestic production of food grains is given some

attention in this study because of its link to problems of price and marketing policy. While a comprehensive analysis of the complex issues involved is, of course, not possible here, this report does briefly explore the question of how much relative prices of groundnuts and food grains would have to shift in order to make specialization in groundnut exports less economically attractive to the Gambia.

For a number of reasons, to be detailed below, the Gambian government's goal of diversifying the agricultural sector has not yet produced tangible results. The Gambian farmers' traditional view of groundnuts as a cash crop, whose production should be maximized even at the expense of cereals crops, has been reinforced by some powerful economic and non-economic factors.

-Firstly, and most importantly, the Gambia Produce Marketing Board (GPMB), an efficient institution, offers an attractive and guaranteed price for the farmers' groundnuts. The GPMB marketing process, to be explained later in the report, effectively collects the groundnuts, paying the farmer cash on delivery for this product. The groundnut price to the farmer has been steadily increasing from 200 D/ton in 1972 to 408 D/ton in 1976. These steady increases have instilled in the farmer the expectation of continually favorable groundnut price movements. It should also be emphasized that the stability and certainty of the marketing process, with its guaranteed and always-respected price, eliminate, from the point of view of the farmer, all marketing risks associated with groundnut production.

-Secondly, the Gambian farmer and consumer traditionally have had access to imported food at a reasonable cost. The Gambia River, flowing the length of the country, has reduced transport costs, providing easy access to all localities. Relatively liberal trade policies have allowed food goods, as

well as consumer goods, to enter the Gambia freely. Recently, as a result of international drought relief aid and other sustaining donor programs, the domestic food supply has been significantly augmented. The important point is that not only the Gambian urban consumers but also the rural peasants have easy access to reasonably priced food sources. This, of course, has eliminated the necessity for the Gambian farmer to supply the urban food market and reduced his own need for self-sufficiency. In the presence of an attractive producer price for groundnuts and a reasonable consumer price for imported rice, an organized and extensive domestic cereals market has not been able to develop. The result, of course, is an increased specialization in groundnut production.

-Thirdly, recent natural disasters seem to have affected the millet and sorghum crop relatively more intensely than the groundnut crop. The terrible drought of 1971-1974, which resulted in economic losses in other Sahel countries, was manifested in the Gambia primarily by an abrupt termination of late season rains. Millet and sorghum yields depend on these late rains. Also, recent attacks by pests, birds and beetles have damaged the millet and sorghum crop, while little affecting the groundnut crop. The Gambian farmer in the last few years has thus been subject to greater production risk with his millet and sorghum crop, further stimulating the allocation of resources to groundnut production.

Finally, rising income levels, reasonable prices for imported rice, and the growing attachment of the urban population to rice has led to a change in consumer demand away from the traditional staples, millet and sorghum, to a more varied diet of rice, fresh vegetables and meat. While domestic rice production has been encouraged with some tangible results, the shift

in demand has been satisfied primarily by rising food imports and expanded food aid.

In summary, the supply of millet/sorghum is constrained by the opportunity cost of groundnut production; demand for millet and sorghum is constrained by the presence of substitute products (imported rice) at reasonable prices. The nature of the domestic cereals market reflects the Gambia's heavy dependence on external food supplies. Any programs aimed at improving domestic cereals production must consider these serious marketing problems. Otherwise, programs increasing millet/sorghum yields risk encouraging further a substitution of agricultural land and labor from cereals to groundnuts. Cereals production would remain constant, satisfying certain minimum needs for auto-consumption; groundnut production, benefiting from increased factor use, would increase. The following report will explain in greater detail the agricultural marketing processes in the Gambia.

II. GRAIN PRODUCTION, IMPORTATION AND FOOD AID

The following section will present the existing production and consumption statistics for the major cereal grains in the Gambia. Following a general review of these statistics, a more detailed examination of individual crops will be undertaken, as well as a closer examination of both commercial imports and international food assistance.

A. Current Production and Consumption

Table I indicates current agricultural production, acreage and yields. Table II attempts to divide the Gambian annual cereals consumption into three sources: local production, commercial imports, and international food assistance. Finally, Table III indicates for each year the percentage of food consumption provided by each of the three sources.

Table I. Acreage, Production and Yields for Major Crops  
(Acreage: 000s acres, Production: 000s tons, Yield: lb/acre)

Crop	1973/74			1974/75			1975/76			1976/77		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
Groundnuts	182.4	112.9	1353	240.0	135.6	1269	261.3	133.0	1122	135		
Rice	46.4	25.5	1209	54.1	28.4	1155	55	30.0	1200	30		
Sorghum	53.3	14.4	631	52.2	16.1	677	57.4	12.4	585	12		
Millet	66.5	18.6	615	91.6	28.0	673	90.8	21.5	521	20		
Maize				13.6	9.6	1578	10.4	10	884	10		
Fonio				8.2	1.7	473	5.8	1.8	717	1.5		
Cotton	.75	.2	789	1.0	.2	592	1.1	.3	588	.		
TOTALS:	349.35			460.7			481.8					

SOURCE: Gambian Agricultural Sample Survey 1975

Table II. Cereals Balance.  
(000s tons)

	1973/74				1974/75				1975/76				1976/77			
	GP	I	FA	T	GP	I	FA	T	GP	I	FA	T	GP	I	FA <sup>a</sup>	T
Millet	18.6			18.6	28			28	21.5			21.5	20	5.0		25
Sorghum	14.4		9.5	23.9	16.1		7.9	24	12.4		8.0	20.4	12		4.8 <sup>b</sup>	16.8
Rice <sup>c</sup>	16.58	12.9		29.48	18.46	19		37.46	19.5	30	2.0	51.5	19.5	34	1.6	55.1
Maize					9.6			9.6	10		2.0	12	10			10
Finio					1.7			1.7	1.8			1.8	1.5			1.5
Wheat				2.0			2	2								.7
TOTAL	49.58	12.9	9.5	<u>71.98</u>	73.86	19	9.9	<u>102.76</u>	65.2	30	12	<u>107.2</u>	63	39	7.1	<u>109.1</u>

GP - local production  
I - commercial imports  
FA - food aid

- a. Only until Oct. of 1976.  
b. Millet often flows from Senegal to the Gambia when it can be favorably exchanged for consumer goods. No estimate of the magnitude, however, can be made, as it primarily involves village trading along the borders.  
c. The figures of local production in Table I have been multiplied by .65, representing the transformation of paddy to edible rice.

SOURCES: The Gambia, Ministry of Agriculture, Central Statistics Division, Agricultural Survey of the Gambia, 1974-75.  
The Gambia Produce Marketing Board.  
The Gambia, Ministry of Local Government.  
World Food Program.

Table III. Percentage Sources of Cereals.

	1973/74			1974/75			1975/76			1976/77		
	GP	I	FA	GP	I	FA	GP	I	FA	GP	I	FA
Millet	26%			27%			20%			18%	5%	
Sorghum	20%		13%	16%		8%	12%		8%	11%		4%
Rice	23%	18%		18%	18%		18%	28%	1.5%	18%	31%	1%
Other				11%		2%	11%		1.5%	11%		1%
TOTAL	69%	18%	13%	72%	18%	10%	61%	28%	11%	58%	36%	6%
External Sources				<u>31%</u>			<u>39%</u>			<u>42%</u>		

The preceding figures on Gambian domestic production, commercial imports and food aid must be viewed with caution. Production figures for the 1976/77 season are very rough estimates reflecting the prevailing belief that production was at best stagnant or, as in the case of early millet, actually declined. Production figures for prior years are estimates made from The Agricultural Sample Survey.

The commercial import figures also require some words of caution. Firstly, millet and sorghum imports, which are part of traditional Senegalese/Gambian border trade, are not included in the recorded trade statistics. These can be significant. For the 1976/77 period, Senegalese authorities estimate fairly substantial quantities of Senegalese millet and sorghum have been sold to Gambians. Secondly, the official statistics for rice imports, provided by the GPMB, might overstate actual consumption of imported rice for two reasons. Some imported rice has traditionally been part of the Senegalese/Gambian border trade. Higher effective rice prices in Senegal have often attracted imported rice from the Gambia. Due to compensating rice price adjustments by Senegalese authorities, however, this aspect of the border trade should be minimal this year. Also, the GPMB has been accumulating stores of imported rice, taking advantage of favorable world prices for rice. Consequently, the 1975/76 and 1976/77 figures for rice imports probably overstate local consumption of imported rice.

Finally, the food aid statistics suffer from certain ambiguities and are somewhat at variance with official World Food Program statistics, particularly for the 1974/75 and 1975/76 seasons. This is primarily due to differing annual accounting periods used by this study and those of the WFP.

Also, WFP statistics are for deliveries within a given time period, while this report attempts to estimate actual distribution and consumption of food aid.

Notwithstanding the above complications, certain meaningful conclusions emerge from a review of production, import and food assistance statistics. Firstly and most importantly, the actual tonnage of domestically produced cereals appears to have declined during the last three seasons. The estimated production figures drop from 83,000 tons to 75,700 to 72,000 during the 1974-76 period. The size of this decline is attributable to declining millet/sorghum production, which fell during this period from 44,100 to 33,900 to 32,000 tons. Domestic rice production remained relatively constant at 30,000 tons during the 1974-76 period. While part of the decline in millet/sorghum production can be attributed to deficiencies in late rains and, more particularly, this year to insect attacks on early millet, the prevailing opinion in the Gambia is that most additional resources have been channeled into groundnut production. This would be expected, given the continually increasing groundnut price during this period. The 1974/75 price was 310 D/ton. The price rose during the following two seasons to 370 D/ton (1975/76) and 408 D/ton (1976/77):

The figures for acreage devoted to each crop suggest that most of the additionally cultivated land was used for groundnut production. While total acreage cultivation appears to increase substantially, the totality of that increase during the 1974/75 to 1975/76 period was in groundnut acreage. This followed the substantial 1973/74 to 1974/75 price increase for groundnuts from 230 Dalasis to 310 Dalasis. Land devoted to food crops - millet, sorghum, rice and maize - remained relatively constant at 220,000 acres between 1973

and 1974.

Production of food grains, however, seems to have dropped from 83,000 tons to 75,000 tons, implying that yields per acre for cereals substantially dropped. If true, this is probably due in part to the periodic labor shortages found in Gambian agriculture. Groundnuts, sorghum, and millet all require planting in the first weeks of July and harvesting in November/December. Farmers trying to benefit from increased groundnut prices but not wishing to reduce cereals production tried to increase groundnut acreage and maintain cereal acreage. However, the average farmer did not have sufficient labor time during peak demand periods to support the increased total acreage. As expected, labor priority was given to the groundnut crop, with the cereals crop being neglected. This is the most likely reason for the apparent reduction in yields during the 1974-75 and 1975-76 periods. There is some indication that the farmer, recognizing his inability to adequately cultivate this increased surface, reduced acreage to cereal crops during the 1976-77 campaign.

This apparent reduction of acreage is one factor accounting for the decline in cereal production from 1975-76 to 1976-77. But there were also difficulties due to late rains and to special problems of pests, particularly attacks by beetles and birds on the early millet crop. This is discussed further below.

Consistent with the decline in local production is an increasing dependence on the exterior to meet local consumption needs. Table III shows that the percentage of food grain consumption satisfied by external sources, food aid and imports has been increased from 28 to 42 percent during the 1974-76 period. Again, while the figures are subject to certain reservations

due to the above-mentioned statistical problems, the main conclusion, that of a growing dependence on external food sources, is irrefutable. While food aid has continued to satisfy a substantial component of local consumption needs, the shortfall in local production has been met primarily through increased imports of rice by GPMB. Their commercial imports of rice have increased steadily from 19,000 tons to 34,000 tons during the 1974-76 period. In fact, since 1974 imports of rice have exceeded local production. If the estimates for 1976-77 prove true, imported rice alone will account for 31 percent of total Gambian grain consumption. Thus, instead of progressing toward its stated goal of greater food self-sufficiency, the Gambia has increased its dependence on external food self-sufficiency, the Gambia has increased its dependence on external food sources during the last three years.

An interesting confirmation of this lack of self-sufficiency is provided by the 1974-75 Agricultural Sample Survey. In a survey of 1,382 farmers, it was found that half the farmers were not self-sufficient with even one crop. This means that those farmers had to acquire millet, sorghum, rice and maize. Only about 25% of the farmers interviewed were self-sufficient in two crops, primarily millet and sorghum. The importance of this survey is its demonstration that within the Gambia not only the urban population but also the rural population is dependent on exterior sources of food.

#### B. Domestic Crop Analysis

A detailed appraisal of recent production trends for major Gambian crops will now be presented. The Gambia is divided into five administrative units: the Upper River Division (URD), MacCarthy Island Division (MID), Lower River Division (LRD), Western Division (WD) and North Bank Division (NBD). The URD, LRD, and WD are primarily groundnut areas and inhabited by Madinkos, who are said to be especially sensitive to economic forces. Currently, this group is specializing, producing groundnuts for cash sales and purchasing food. The MID is the primary area of current and expected future rice production; this area is primarily inhabited by

Serahuli, who also have a tradition of attachment to modern economic activity. The Serahulis are present also in the URD. Finally, the URD is inhabited by the Fula, who historically have given a greater priority to food self-sufficiency. The Fula grow some groundnuts, but they are more likely to cultivate a higher proportion of their annual cereal needs than the other groups in the Gambia.

The common farming unit in the Gambia, the Dabada, is a group of twelve who jointly utilize their labor to grow several crops on an average plot of 10 acres. In addition, the Dabada often has its labor force supplemented by the "stranger farmer." The stranger farmer is generally a migrant (Malian, Senegalese, Guinean) who comes to a Gambian village during the farming season. Generally, he finds a "host" to whose fields he devotes three days work per week, receiving in return lodging, food and a small plot which he may cultivate for his own profit. The stranger farmer is very important in the Gambia, where labor requirements during periods of peak demand are insufficient to adequately cultivate the area planted.

A recent World Bank study estimated total monthly labor requirements during the 1975 season as follows:

Table IV. Monthly Labor Requirements (10,000 work-days)

	<u>J</u>	<u>F</u>	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>	<u>N</u>	<u>D</u>
Demand	95	12	8	8	106	204	428	219	121	381	56	258

Peak periods are during the July planting after the first rains, during the October harvest and weeding, and during the December harvest. While the World Bank study estimated that 474 (x 10,000) work-days of labor were available, activity rates in excess of 90% are then required during the peak month of July. Thus, the stranger farmer's presence is important.

Another implication of this peak period labor shortage is that, without

capital intensification or labor productivity increases, any increase in production of one crop implies corresponding reductions in other crops in the short run. (The labor supply can, of course, be supplemented with additional stranger farmers). As previously stated, during the 1975/76 campaign, attempts at increasing groundnut production probably resulted in the corresponding decreases in grain production indicated by the statistics. The labor supply was simply not sufficient to adequately cultivate the increased groundnut acreage while maintaining the cereals acreage. Priority was given to groundnuts, and total cereals production declined. A more detailed examination of each major crop - groundnuts, millet, sorghum, rice, maize, and cotton - will now follow.

1. Groundnuts

Groundnuts are certainly the mainstay of the Gambian economy, accounting for 1/3 of GNP and utilizing in excess of 60% of currently cultivated surfaces. The production, acreage and yield figures are as follows:

Table V. Groundnut Production  
(Acreage, 000 acres; Production, 000 tons; Yield, lbs/acre)

	<u>71/72</u>	<u>72/73</u>	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>
Acreage	NA	NA	182.4	240.0	261.3	270*
Production	124	100	112.9	135.6	133	135*
Yield	NA	NA	1353	1267	1122	1000*

\* Unofficial figures

SOURCES: The Gambia, Ministry of Agriculture, Central Statistics  
Division, Agricultural Survey of the Gambia, 1974-75.  
The Gambia Produce Marketing Board.  
The Gambia, Ministry of Local Government.  
World Food Program.

In response to increased groundnut prices, total acreage of groundnuts has been increasing. Due to the labor constraint, and thus an inability to adequately handle this increased acreage, yields have been decreasing. The current five year development plan (1975-1980) calls for an annual average groundnut production of 150,000 tons, reaching 180,000 tons in 1980. This 1980 figure represents an increase in production of 45,000 tons from the 1976/1977 level. It has been observed above that without increased labor productivity or capital intensification an increase in groundnut production can only be accomplished by shifting more land and labor from the production of other crops to groundnuts or by attracting more stranger farmers from outside. Recognizing this, and neglecting the in-migration issue, the development plan calls for an intensification of groundnut production, hoping to increase yield per acre from 1000 to 1500. If current acreage in groundnuts were maintained, yields of 1500 pounds per acre would imply production in excess of 184,000 tons.

To accomplish this goal - an increase in groundnut production with no corresponding decrease in cereals production - the Department of Agriculture, through its extension agency, the Mixed Farming Centers (described in the next section), since 1971 has pushed a technological package designed to increase yields. The package involves the use of improved seed, purchased inputs (fertilizer, seed dressing), improved planting, spacing, weeding, and harvesting, all of which are demonstrated to participating farmers within a region. The program claims to have increased yields of farmers who have been reached. The hope is that through duplication other farmers will adopt the improved practices. During the 1975/76 season, 400 farmers cultivating 800 acres of groundnuts were affected in the Lower River, MacCarthy Island, and Upper River Divisions. This year 500 farmers in the North Bank, MacCarthy Island, and Lower River Division should be involved. By the geographic

selection of the farmers for the program, it is hoped that an additional 4-5000 farmers will be exposed to the program and will duplicate the improved methods. To participate in the program, a farmer must be a member of the cooperative society, primarily in order to allow easy post-harvest repayment of the credit extended by the Agriculture Department for the inputs used in the program.

While the design of this program is effective, it directly reaches so few farmers that significant increases in yields can only be expected after many years. Thus, continued groundnut price increases could encourage re-allocation of resources from cereals to groundnuts. If the planned groundnut production target of 180,000 tons is met, it may be at the expense of reduced millet, sorghum, and/or maize production.

## 2. Millet

Millet is an important staple food in the Gambian diet. Total domestic production of millet places the crop second in importance, behind rice, as a grain crop. Two main types of millet are grown in the Gambia. Early millet (Suno), planted in July and harvested in September, is cultivated as a pure crop, primarily in the MID, NBD, and LRD. Late millet (Sanyo), planted in late July and harvested in early November, is often inter-cropped with groundnuts and is grown extensively throughout the Gambia.

Current production estimates are as follows:

Table VI. Millet Production  
(Acreage, 000 acres; Production, 000 tons; Yield, lb/acre)

	<u>1973/74</u>	<u>1974/75</u>	<u>1975/76</u>	<u>1976/77</u>
<u>SUNO</u>				
Acreage	NA	24.6	16.9	NA
Production		9.7	3.0	
Yield		966	401	
<u>SANYO</u>				
Acreage	NA	67	73.9	
Production		18.3	18.5	NA
Yield		644	559	
<u>TOTAL:</u>				
Acreage	66.5	91.6	90.8	NA
Production	18.6	28.0	21.5	20

SOURCE: The Gambia, Agriculture Survey, 1975; 1975/77 estimates from Gambian authorities.

During the 1975/76 season, yields of early millet dropped substantially due to attacks by insects, particularly beetles, and birds. Some experts have estimated losses at 40% of the crop. The same beetle problem occurred with early millet during the 1976/77 season; estimated losses were placed at 30% of the crop.

As one can see from the figures, acreage to millet declined slightly from 74/75 to 75/76. Sources in Gambia say there was a further decline during the 76/77 growing season. Nonetheless, the current national development plan calls for 25 to 30% increases in current production of millet. This would be accomplished with a 5% increase in acreage devoted to millet and substantial increases in productivity. It is unclear how the farmer will be persuaded to increase acreage to millet when groundnut prices are so high.

For the increase in productivity, the Agriculture Department has introduced a small pilot program for millet, similar to that for groundnuts. On about 80 acres, spread throughout the country, 23 families will receive the package program of fertilizer, seed dressing, pest control chemicals, and instruction in better cultivation methods. As with the groundnut program, it is hoped that other area farmers will duplicate the improved methods. Unfortunately, given the current price situation and the lack of major programs to increase millet production, no substantial increases in millet production can be expected in the near future.

### 3. Sorghum

Sorghum is also a major food crop grown throughout the Gambia, but particularly in URD and MID. Planted generally in July and harvested in November, it basically has a similar growing season to that of groundnuts. Current production figures are as follows:

Table VII. Sorghum Production  
(000 acres; 000 tons; yield - lb./acre)

	<u>1973/74</u>	<u>1974/75</u>	<u>1975/76</u>	<u>1976/77</u>
Acres	53.3	52.2	57.4	NA
Production	14.4	16.1	12.4	12
Yields	631	677	585	NA

SOURCES: The Gambia, Ministry of Agriculture, Central Statistics Division, Agriculture Survey of the Gambia, 1974-75.

The Gambia Produce Marketing Board.

The Gambia, Ministry of Local Government.

World Food Program.

As with millet, sorghum production is constrained by relative prices which encourage a farmer's preference for groundnuts because of (1) sorghum's greater risk of natural loss as compared to groundnuts, (2) lack of an organized and remunerative sorghum market due (as we will see below) to the presence of imported rice at attractive prices, and (3) the prevalence of traditional methods of cultivation, which have relatively low productivity.

As with millet, the current development plan calls for a 25 to 30% increase in sorghum production during the next five years. Again, this is to be accomplished through a pilot package program which will utilize, during the 1976/77 campaign, about 40 farmers in the URD and MID. Inputs, pesticides, and improved cultivation methods will be introduced. However, as with millet, to change the neglect of the crop by the farmer during times of peak labor demand, a secure and remunerative market must be developed.

#### 4. Rice

Rice is a staple food in the Gambia, with local and imported rice satisfying about 50% of Gambian cereal requirements. Imported rice alone seems to satisfy approximately 30% of food requirements. Recognizing the importance of replacing imported rice with locally produced rice, the Gambia has committed itself to development of local rice. The development of local rice production is more likely than are significant increases in millet and sorghum production, for many reasons. Firstly, rice is already accepted by the whole population as a staple food and marketing channels exist, traditional and formal. Secondly, rice does not compete with groundnuts for agricultural land. Sizeable new tracts of swampland and irrigated terrain (utilizing the Gambian River) can be introduced with no reduction in groundnut acreage. Finally, rice in the Gambia has traditionally relied on women's

labor; thus, its development would not intensify the labor shortage to the same proportion as millet/sorghum development.<sup>1</sup>

Current rice statistics are as follows:

Table VIII. Rice Production  
(000 acre; 000 tons; lb/acre)

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	<u>1973/74</u>	<u>1974/75</u>	<u>1975/76</u>	<u>1976/77</u>
Acreage	46.4	54.1	55	NA
Production	25.5	28.4	30	30
Yields	1205	1155	1200	NA

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SOURCES: The Gambia, Ministry of Agriculture, Central Statistics Division, Agriculture Survey of the Gambia, 1974-75.

The Gambia Produce Marketing Board.

The Gambia, Ministry of Local Government.

World Food Program.

Rice is grown under three types of conditions in the Gambia: rainfed (35% total rice surface), swamps (60%) and irrigated schemes (5%).

Irrigated Rice: Irrigated rice was introduced by the Taiwanese in 1966 with a project of 4000 acres in the MID and URD; in both these areas, fresh water from the Gambian river is available throughout the year. Currently, the project has been taken over by representatives of the People's Republic of China, who replaced the Taiwanese in 1974. The project produces about 7000 tons of paddy rice (4500 tons of milled rice) annually with a yield of 2500 lbs. of clean rice per acre. This production is, however, about half

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<sup>1</sup>However, rice is more labor-intensive, and the rice producers may have less easy access to external labor supplies (stranger farmers).

of the potential for the irrigated surface. The project calls for double cropping - a dry season crop, planted in January, transplanted in late February, and harvested in June; and a second crop during the rainy season planted in June, transplanted in July, and harvested in October. Currently, only about 1.1 crops per year are realized. Many farmers are reluctant to plant the second crop due to other commitments during July (groundnuts) and problems of drainage caused by rains. Pumps are not available in sufficient quantity to remove excessive water and prevent flooding. Current plans call for an extension of the irrigated surface to 11,000 by 1980. This will be economically unfeasible unless the pump problem is solved. Moreover, the price of rice must be sufficiently remunerative for the farmer to devote more labor to the second crop.

Upland or Rainfed Rice: It appears that about 35% of the rice acreage is devoted to upland rice. Perhaps 7000 tons (a yield of 800 lbs. per acre) is realized from upland rice. Currently, a pilot project program with 70 farmers is aimed at introducing improved methods for upland rice. This project includes the use of chemical fertilizer and modern cultivation methods. The problem with significant increases in upland rice is the labor constraint, as upland rice is planted in July and harvested in October. Also, farmers need to be properly trained in constructing bunds, small hand-built dams that trap the water during the rainy season. Without bunds, the rain, of course, runs off and the crop is jeopardized.

Swamp Rice: Swampland or tidal flooding rice is planted in July, transplanted in September and harvested in January, utilizing swampland along the Gambian River. Probably 60% of rice surface is devoted to swampland rice with a total production of about 16,000 tons. Yields vary greatly from 1000 lbs./acre to perhaps 3000 lbs./acre. The main problem with the extension of swamp

rice concerns the saline content of the Gambia River. The tidal flooded rice is centered around the LRD and NBD; however, upriver as far as Kuntaur, an adverse level of salt becomes present during the autumn months, after the fresh water rains have flowed into the ocean. This salinity problem adversely affects yields and has prevented a further intensification of swampland rice. If a dam were constructed on the Gambia River, this problem could be avoided. Such a project is being considered by Gambian authorities. Also, some tidal fields have had to be abandoned due to difficulties of access. Bridges and roads have fallen into disrepair and will have to be rebuilt if this productive land is to be reclaimed.

As with upland rice, a pilot project aimed at 100 farmers is scheduled for the 1976-77 season. This program will be basically identical to that for the upland rice.

Despite the problems referred to - salinity, resistance to double cropping on irrigated surfaces, and poor access to swampland areas - the intensification and extensification of rice production would seem the most promising remedy to the Gambia's growing dependence on external food sources. Irrigated rice, with its attractive yields from double cropping, is regarded as the most attractive form of rice production.

##### 5. Maize

Within the Gambia, maize is extensively cultivated in the Upper River Division, where the Serahulis consume it as a major food item. In other parts of the Gambia, maize is only sparsely cultivated. Current production figures suggests that about 10,000 tons of maize are annually harvested, with yields of about 1500 lbs/acre. Maize provides certain advantages over other cereal crops. Firstly, it is an early maturing crop (90-100 days) which is usually harvested in September. Thus, it provides the advantage of avoiding the

peak labor constraint of the November/December harvest and, secondly, is available as a food item in September when locally grown food is generally very scarce. Also, maize is relatively more insulated from attacks by pests than millet and sorghum.

Nevertheless, a more extensive cultivation of maize has been hindered by the following factors:

- A preference for millet, sorghum, and rice as staple food items by consumers. Demand is definitely constrained by a preference for imported rice, which is available at relatively attractive prices.
- The greater difficulty for women to prepare maize for consumption.
- The lack of developed marketing arrangements for maize.
- Lack of any organized extension program to increase yields.

Currently, the Agricultural Department has begun a Package Pilot Program for maize, similar to that for groundnuts. This program plans to introduce chemical fertilizer, seed dressing, crop protection chemicals, and improved cultivating practices for participating farmers. This program will only be introduced on forty acres of land, 20 in the MID and 20 in the URD. Even with its attribute of an early harvest, significant increases in maize production and consumption in the Gambia are not expected due to the consumers' taste preference for other foods. Some potential, however could exist for marketing the crop as livestock feed. This possibility depends on a greater development of the Gambian livestock sector.

## 6. Cotton

While small quantities of cotton for local weaving/spinning have traditionally been cultivated in the Gambia, it was only in 1969 that, through the initiative of the Department of Agriculture, cotton was introduced as a commercial venture. Currently, production is primarily in the Upper River

Division with levels of acreage, production, and yields as follows:

Table IX. Cotton Production

(Production - tons; Yield - lb/acre; acreage - 000s)

	<u>1969-70</u>	<u>70-71</u>	<u>71-72</u>	<u>72-73</u>	<u>73-74</u>	<u>74-75</u>	<u>75-76</u>
Acreage	27	100	200	500	750	1000	1113
Production	10	33	42	169	264	264	292
Average Yield	809	739	470	760	789	592	588

SOURCES: The Gambia, Ministry of Agriculture, Central Statistics  
Division, Agricultural Survey of the Gambia, 1974-75.  
The Gambia Produce Marketing Board.  
The Gambia, Ministry of Local Government.  
World Food Program.

Current yields are a disappointing 588 lbs/acre even though "target" yields were 1000 lbs/acre. Agriculture Ministry Officials attribute these low yields to a combination of factors:

- Current prices stimulate greater attention by the farmer to the ground-nut crop than the relatively less profitable cotton crop.
- Inadequate pest control has left the cotton crop vulnerable to certain natural hazards.
- Poor cultivation methods are used by the Gambian farmers who are not accustomed to a cotton crop.
- There is a lack of interest by the buying agent (GPMB), which does not find the cotton operation sufficiently profitable.
- Lack of mechanization in the production process.

Currently, the African Development Bank is financing a cotton program, which aims to bring 10,000 acres of cotton into cultivation by 1980. This goal, considering the relative profitability per acre of groundnuts vis à vis cotton, may prove too ambitious. With the prices of groundnuts and

cotton at present levels, few farmers will reallocate land and labor from groundnuts to cotton. The Department of Agriculture, at certain Mixed Farming Centers (MFCs) in the Upper River Division, is conducting small pilot projects for cotton, similar to those for groundnut production. Inputs are provided on credit to selected farmers, and improved cultivation methods are demonstrated. Due to the relatively small scale of this program and the current price situation, no significant increases in cotton production can be expected in the near future.

### C. Commercial Imports

The Gambia imports commercially large quantities of rice and, to a lesser extent, millet and sorghum. This section will briefly describe the importance of these imports and the participating agencies.

#### 1. Millet and Sorghum

Millet and sorghum enter the Gambia in three ways - legal commercial imports, clandestine border trade with Senegal and food aid. Traditionally, a large amount of illegal and unrecorded border trade has occurred between the Gambia and Senegal. As a general rule, imported rice and imported consumer goods are subject to lower import duties in the Gambia and have often been attracted by price differentials to Senegal. Groundnuts have often been shipped from Senegal for sale in the Gambia. This has occurred not only as a result of higher Gambian groundnut prices but also because the groundnut "campaign" (marketing season) usually opens earlier in the Gambia. Senegalese farmers desiring cash will attempt to sell their groundnut crop in the Gambia. Also, millet and sorghum have often entered the Gambia as a result of higher prices in the Gambia. Often, this trade involves barter transactions, with consumer goods exchanged directly for millet and sorghum. However, this year, Senegalese authorities estimate fairly substantial quantities of millet and sorghum

are being sold to Gambians for cash by small Senegalese traders. This millet and sorghum is consumed by rural Gambian producers near the borders; it is not aimed at the urban Banjul market.

Finally, millet and sorghum in more substantial quantities have been legally imported into the Gambia. This began in 1976 when price differentials for millet and sorghum between Senegal/Mali and the Gambia became sufficiently large. The legal procedure is for a trader to receive an import permit from the Gambian government and have the imported product inspected by the Gambian Crop Protection Unit. In 1976, three permits, totaling 5000 tons, were granted; and imports of 1000 tons of millet from Mali, 1000 tons of millet and sorghum from Mali, and 3000 tons of millet from Senegal were authorized. This millet and sorghum was sold in both urban and rural markets and by smaller traders, who acquired it from the importer. Currently, an increased price for millet and sorghum in Senegal and a depreciation of the Dalasis vis à vis the CFA franc seem to have rendered such commercial imports unprofitable. Since September of 1976, it seems that no major commercial imports of millet and sorghum have appeared.

## 2. Rice

As previously stated, imported rice is a significant component of Gambian cereals consumption, particularly in the urban consuming center of Banjul. Until 1965, the importation of rice was entirely free of controls. Beginning in 1965, the Gambian government entered into the importing process with the creation of a licensed consortium of business people authorized to import rice, reselling it at a fixed price which permitted a fair margin of profit. With the growing importance of imported rice, the government decided in 1973 to give complete control of this operation to the GPMB, which is now the sole legal agent for the importation of rice. The GPMB, after making monthly estimates of rice needs, purchases rice on the international market for delivery at Banjul.

This estimating procedure is, however, made more difficult by the existence of significant quantities of food aid, the availability of which obviously affects the demand for rice. Unfortunately, the GPMB is not always aware of the quantities of food aid being delivered.

The imported rice is distributed by the GPMB to its licensed agents who, in turn, sell to the smaller traders who directly supply the consumer. The prices for each transaction are controlled with fixed profit margins for each market agent. The National Trading Corporation (NTC), the government distributor of consumer goods, markets more than 50 percent of the imported rice. It is estimated that more than 70 percent of the imported rice is consumed in Banjul. This estimate is complicated by the fact that rice is often purchased in Banjul by urban workers, who then bring the rice into rural areas for their families during the months of scarcity. One can safely state that over 30 percent of the imported rice is consumed in rural areas primarily by farmers.

As previously stated, the price of rice to the wholesaler and to the consumer is controlled. A sufficient supply of imported rice, coupled with consumer awareness of the legal price, seem to insure that the controlled price is respected. Controlled prices for the 1976/77 season are as follows:

Table X. Rice Price Structure  
(Dalasis per 160 lb. bag)

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	<u>Banjul Area</u>	<u>Other</u>
Ex-GPMB Store	41.26	41.26
Wholesale Margin	1.40	1.40
Wholesale Price	42.66	42.66
Retail Margin	1.64	3.24
Retail Price	44.30	45.90

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SOURCE: GPMB

The retail price for sales in smaller quantities is .28 Butus/lb. in Banjul (44.8 D/bag). The higher price outside of Banjul is aimed at compensating the retailer for transport costs.

As previously noted, imports of rice have increased substantially during the last few years, as is evident from Table XI.

Table XI. Rice Imports  
(tons)

<u>1970/71</u>	<u>71/72</u>	<u>72/73</u>	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>
7,500	13,602	25,450	12,963	19,000	30,000	34,000

SOURCE: GPMB

The significant decline in 1973/74 was primarily due to a corresponding increase in food aid and the building up of substantial stocks of imported rice during the 1972/73 campaign. Currently, rice imports are steadily increasing as the primary means of alleviating a growing Gambian cereals deficit.

D. International Food Assistance

Table XII. Food Assistance-Calendar Year  
(tons)

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u> <sup>*</sup>
Sorghum	6300	NA	9500	7932	7990	4814
Rice					2000	1600
Wheat				2000		700
Maize					2000	
TOTAL	6300	NA	9500	9932	11,990	7114

\*Ten Months      NA = Not Available

SOURCE: Ministry of Local Government, WFP and Catholic Relief.

The above estimates of food aid consumed by the Gambians indicate the importance of international food assistance in satisfying the Gambia's general food requirements. Significant shipments of food aid, begun during the drought years, have continued. Gambian authorities have transmitted a request to the FAO for an additional 3000 tons for this 1976/1977 season.

In general, the food aid received by the Gambia originates from the following sources: Catholic Relief, Freedom from Hunger Campaign, WFP/USAID and occasional grants (EEC, People's Republic of China). The distribution, primarily under the auspices of the Ministry of Local Government, is accomplished through programs such as the School Feeding Program and community development/self-help programs. Catholic Relief administers its own program of community development with food used as compensation. It should also be noted that the food aid distributed by these organizations is not limited to grains but has included fish, oil and other products.

There are two essential aspects of the organization of food aid which are disruptive to the Gambian grain situation. Firstly, the paucity of storage capacity at Banjul for food crops often results in food aid competing with imported rice for the scarce storage space. Secondly, the presence of food aid reduces, to some extent, the demands for imported rice. However, the GPMB, responsible for the projecting and purchasing of this imported rice, is not always cognizant of food aid deliveries. A recent proposal to centralize the delivery and storage of food aid under the direction of the GPMB would in large measure reduce these organizational problems. The GPMB could more accurately forecast imported rice needs and more efficiently coordinate deliveries utilizing the scarce storage capacity more efficiently.

More fundamentally, however, the issue of the Gambia's dependence on food aid must be addressed by the international donor agencies. The essential

question is whether the continual and expected presence of food aid contributes to the acute specialization in groundnut production at the expense of local food grain production.

### III. INSTITUTIONS IN THE GAMBIA

This section will briefly describe the institutions which intervene in the production and marketing of agricultural products. Also, a description of the mechanism by which the rural consumer is supplied with goods of primary necessity will be given. The section thus focuses on the Ministry of Agriculture, the Gambia Produce Marketing Board (GPMB) and the National Trading Corporation (NTC).

#### A. Ministry of Agriculture

Governmental intervention into the rural sector of the Gambian economy is centralized under the Ministry of Agriculture. That Ministry had total recurrent expenditures of approximately 2.7 million Dalasis within the 1974/75 budget. That level of expenditure is slightly in excess of 10% of total recurrent budget expenditures for that year, or about 1.5% of GNP.

Under the direction of the Ministry of Agriculture are four departments which administer the programming activity. These departments, each of which is headed by a director, are Veterinary and Animal Health, Agriculture, Cooperatives, and Fisheries. The two Departments directly intervening in agricultural production and marketing are Agriculture and Cooperatives.

##### 1. Department of Agriculture

The Department of Agriculture has four main stations; at Yundum, Jenoi, Sapu, and Basse. Additionally, the Jenoi station has a substation at Kerewan, and the Sapu station has one at Kuntau. It is from these stations and substations that the agricultural programming on the level of the farmer is coordinated. At each station, trained Gambian and ex-patriate personnel are involved in agricultural research, seed testing, and other trials. The individual farmer is reached through an agency referred to as the Mixed Farming Centers (MFC). Twenty-four of these centers are strategically located throughout the country,

with each MFC receiving administrative support from an agriculture station.

Each MFC is staffed with two trained extension agents (certified at the agricultural agent level) and three staff for ox-plowing instruction. Until this year, each MFC hosted about 25 selected farmers from neighboring villages between April and June, a time of reduced agricultural activity. Dormitory space and meals were provided to the farmers, who then attended daily classes in all phases of agricultural activity—seeding, weeding, harvesting, and input usage (including instruction in proper plowing). Depending on the suitability of the area's terrain, the crop emphasis varied. In principle, however, each MFC training program was to include all major crops—millet, sorghum, maize, groundnuts, and rice. Demonstration plots were planted using the seeds and techniques of the program, with farmers invited back at harvest time to observe the relatively high yields. In theory, it was hoped that the farmers benefiting from the training course would return to their villages, practicing the methods learned, with other cultivators following the example.

Beginning in the 1977 season, however, it has been decided to modify this program with the agents going directly to selected villages and demonstrating these techniques to the village as a whole. In this manner, it is hoped to reach a greater number of farmers annually and also remove the inconvenience that many farmers suffered due to the two-month separation from family and village. Some agents, however, expressed reservation that with the new system it will be only possible to reach one or two villages annually, unlike the former program in which many villages were represented. Also, the benefits from centralizing materials and inputs, as well as the demonstration plot, will be slightly compromised. This new method, however, will facilitate the Pilot Cereals Project scheduled to begin this year, in which selected villages will participate in an intensive program to increase millet and sorghum yields.

Another program organized directly by Agriculture, with the cooperation of the MFC and the Cooperatives, is the establishment of seed stores at the village level. To prevent spoilage and the consequent repurchase of seeds, cultivators are encouraged to bring seeds to stores constructed by the Ministry of Local Government. Following the harvest, farmers bring groundnut and, to a lesser extent, millet and sorghum seed to the village store where it is bagged, treated and stored at the expense of the Department of Agriculture. Prior to planting, the farmer returns to reclaim the same bags of seed which he stored. This system seems to be working efficiently, preventing loss to the farmers through fire or insects, as well as minimizing any delay at planting time by non-availability of purchasable seeds.

Finally, Agriculture is directly involved in the selection and distribution of fertilizer. In conjunction with the GPMB, appropriate groundnut and cereal fertilizer is selected and ordered. The GPMB, as will be explained later, imports and subsidizes this fertilizer, delivering it to Agriculture. Through the MFC, Agricultural stations, and Cooperatives, this fertilizer is sold to the cultivators.

In general, the agricultural extension program is the direct responsibility of the Department of Agriculture. Also, the Department has a coordinating role in the implementation of special internationally funded programs. Dealing directly at the farm level are the cooperative organizations which are administered by a separate department.

## 2. Department of Cooperatives

Beginning in 1955, the Gambia began setting up District Societies or cooperatives. Administered by the Department of Cooperatives or the Coop Union, 62 district societies with a total membership of 80,000 farmers now exist in the Gambia. No village is unrepresented, and membership is open

to any farmer over the age of 18 upon payment of a 5 Dalasis initiation fee. The cooperatives are primarily institutions for groundnut marketing. Seven of the cooperatives, however, purchased local rice for the GPMB.

GPMB has a legal monopoly on the export sale of groundnuts, utilizing both licensed private traders and cooperatives (each with identical margins) to purchase 40% of the crop; private traders buy the rest. There are advantages for an individual producer to join a cooperative instead of selling directly to private traders. Firstly, cooperative members can purchase fertilizer on credit from the cooperative society; credit sales are not permitted by Agriculture or the MFC. Secondly, groundnut seeds are provided on credit to a farmer needing them at planting time. Also, cash loans for unrestricted purposes (subsistence credit) are available to members at an annual interest rate of 15%. Finally, the profit of the cooperatives, in principle, should be divided between reinvestment in educational or building activities (25%) and distributed dividends (75%). Due to bad loan losses and other forms of management inefficiency, a distributed dividend to members has not yet occurred.

The cooperatives in the Gambia nonetheless play a role in the collection of groundnuts. It is speculated that in the near future the cooperatives will be given the exclusive right for the collection of groundnuts, eliminating completely the role of the licensed private agent. In the field of cereals, the cooperatives are expanding into the collection of rice for GPMB. However, if they are given the monopoly groundnut purchasing, it is unlikely in the near future that the cooperative system could handle expanded responsibilities in grain marketing.

B. Gambia Produce Marketing Board (GPMB)

The Gambia Produce Marketing Board (GPMB) was created in 1949 to facilitate

the collection and export of groundnuts from the Gambia. The GPMB, while a fully government owned enterprise, acts as a relatively independent agent. There is considerable interaction between the Gambian government and the GPMB, particularly with respect to price determination. However, the GPMB has its own board of directors and a London office charged with negotiating the sale of groundnuts to international clients.

Since 1949 the GPMB has grown in size and influence, expanding its operations within the sphere of groundnuts and other agricultural products. Current operations include the following:

1. Groundnuts

The GPMB has complete control of the groundnut trade from the collection at the farm level to the sale on the international market. The GPMB licenses buying agents and also utilizes the cooperatives to purchase from the farmer. Following purchase, the groundnuts are transported by the GPMB's subsidiary transport company, the Gambia River Transport Company. The GPMB, through another subsidiary, the Gambian Produce Marketing Company Ltd., operates its own crushing and milling operations to transform groundnuts into groundnut oil. Mills are located at Banjul and Kaur. The GPMB exports groundnuts both in the form of oil and also in raw form. A London-based office negotiates directly the sale of groundnuts, primarily to France, Holland, Portugal and other European clients. In addition to a legal monopoly for the collection and export of groundnuts, the GPMB has a legal monopoly for the distribution of groundnut oil for local consumption. Finally, as fertilizer is used primarily by farmers on the groundnut crop, the GPMB is responsible for the importation, storage, and delivery to distribution centers of fertilizer. The ordering is done based on estimates of projected needs furnished by Agriculture, and the sale to the farmer from the distribution centers is also coordinated by

Agriculture. The sale price to the farmer is below the cost paid by GPMB, the subsidy being financed by the GPMB fertilizer fund.

## 2. Rice

The GPMB plays a role in both the collection of locally grown rice and the importation of rice. With respect to imported rice, the GPMB has the legal monopoly for rice imports. From its storage facilities in Banjul, sale and delivery are made to licensed traders and, most importantly, the National Trading Corporation (NTC), the government distributor of consumer products. As previously explained, both the wholesale and retail prices of rice are controlled. Between 1972 and 1974, the wholesale price of rice was below the cost price to the GPMB, with the resulting loss financed by the GPMB rice stabilization fund.

The GPMB also acts as a buyer of locally produced domestic paddy rice. It purchases the bulk of this rice from cooperatives. However, it will purchase directly from the producer. It operates a rice mill at Kuntaur for the transformation of paddy to clean rice. The GPMB has handled only very small quantities of local rice, never exceeding 1000 tons. Primarily, this is due to the relatively small amount which is marketed. Also, the GPMB has little incentive to encourage the purchase of local rice, as that operation is financially very costly. With the given purchase price to the farmer, high costs of milling and fixed price to the wholesaler, the GPMB must sell its domestically transformed rice for the same price at which it releases imported rice.

## 3. Cotton

The GPMB also acts as the purchaser for cotton, whose production is being encouraged in the Upper River Division. The GPMB operates a gin at Sapu, and the African Development Bank is studying the possibility of a second mill.

at Basse in conjunction with its cotton project in the Gambia. The GPMB, after ginning the cotton, sells the lint to European customers and exports the cotton seed to Senegal. This is a very marginal operation for the GPMB, as the cotton crop is small, with only about 1000 acres under cultivation and very unsatisfactory yields. Cotton in Gambia is still in the development stag

Thus, while the GPMB's primary function is the collection and export of groundnuts, its influence has extended into many other areas. The preponderance of the GPMB's revenues and profits originate with groundnut trading and export. For instance, groundnut profits for the 1972/73 season were 6 million Dalasis, for the 1973/74 season 35 million Dalasis, and estimated for the 1976/77 season at 16 million Dalasis. In 1973/74, a slight profit was recorded on cotton operations. These profits have been used to subsidize rice milling and marketing, to subsidize fertilizer sales, and for transfers/grants to various funds. For instance, in the 1973/74 campaign, losses on rice operations exceeded 3 million Dalasis. For the 1975/76 campaign, the GPMB broke even on its rice operations. In the current (1976/77) campaign, a slight profit on rice sales is expected primarily due to depressed world prices for rice. During the 1973/74 season, the GPMB subsidized fertilizer sales to the amount of 238,000 Dalasis. Also during that year, the GPMB made a direct grant to the Agricultural Department of 553,000 Dalasis. Last year, the grant to Agriculture was increased to 1.5 million Dalasis as well as a grant of 2.5 million Dalasis provided to the Government Development Fund. After providing these grants and subsidies, the remaining profit is divided between the groundnut price stabilization fund, whose current assets surpass 48 million Dalasis, and the general fund, whose assets total 35 million Dalasis. The purpose of the groundnut stabilization fund is to provide reserves in the event of declines in the world market price of groundnuts. The fund would then be used to support the

groundnut price, preventing unacceptable declines in that price to the farmer.

The relative success of the GPMB, currently possessing assets in excess of 80 million Dalasis with profit estimates of 16 million for this year, can be attributed to the favorable world price of groundnuts, to a relatively low producer price, and to an efficient management, which has been granted a great degree of autonomy by the Gambian government.

C. National Trading Corporation (NTC) and Rural Consumption

In 1973, the National Trading Corporation (NTC), a mixed corporation with 51% direct government participation, was formed as a supplier of consumer goods to the rural population. Presently, the NTC has five depots from which it sells wholesale to traders and fifteen retail outlets for sales to the general public. The fifteen retail outlets are reasonably well placed within the Gambia to maximize access by the public to a NTC outlet.

The NTC primarily markets imported consumer goods (food and non-food items), imported rice, as well as certain Gambian products such as peanut oil, honey, and paints. The pricing policy pursued by the NTC is one of full cost pricing with variable margins. Alcoholic beverages and other luxury items have relatively larger profit margins than goods considered necessities, such as sugar and matches. Transport costs are included in this full cost pricing. At more interior localities, NTC products are sold at higher prices than in Banjul. Further, certain products sold by NTC are subject to price control by government authorities, thus eliminating NTC discretion to price those items.

The NTC is the largest wholesale purchaser of rice imported by the GPMB, selling perhaps 50% of all imported rice. For 1976/77, this would imply rice sales in excess of 17,000 tons. Originally, the NTC was the sole distributor of imported rice, selling both wholesale and retail. However, under the

current system, the NTC sells only to consumers, and the GMPB supplies other distributors directly.

The NTC views its role as both economic and social. Even though attempting to make a reasonable profit, the NTC feels its presence brings more competitive prices to the rural community. Individual traders and other large distributors (CFAO, Maurel Prom) are inclined to respect the prices set by the NTC, for fear of losing their clientele to the NTC. While this competitive influence may be effective in areas relatively close to an NTC outlet, in very remote regions, which are still supplied by the traveling trader, it is unlikely that the NTC has any meaningful influence on price.

#### IV. PRICE POLICY AND MARKETING

This section will describe the marketing mechanism and price policy issues for each of the major crops in the Gambia.

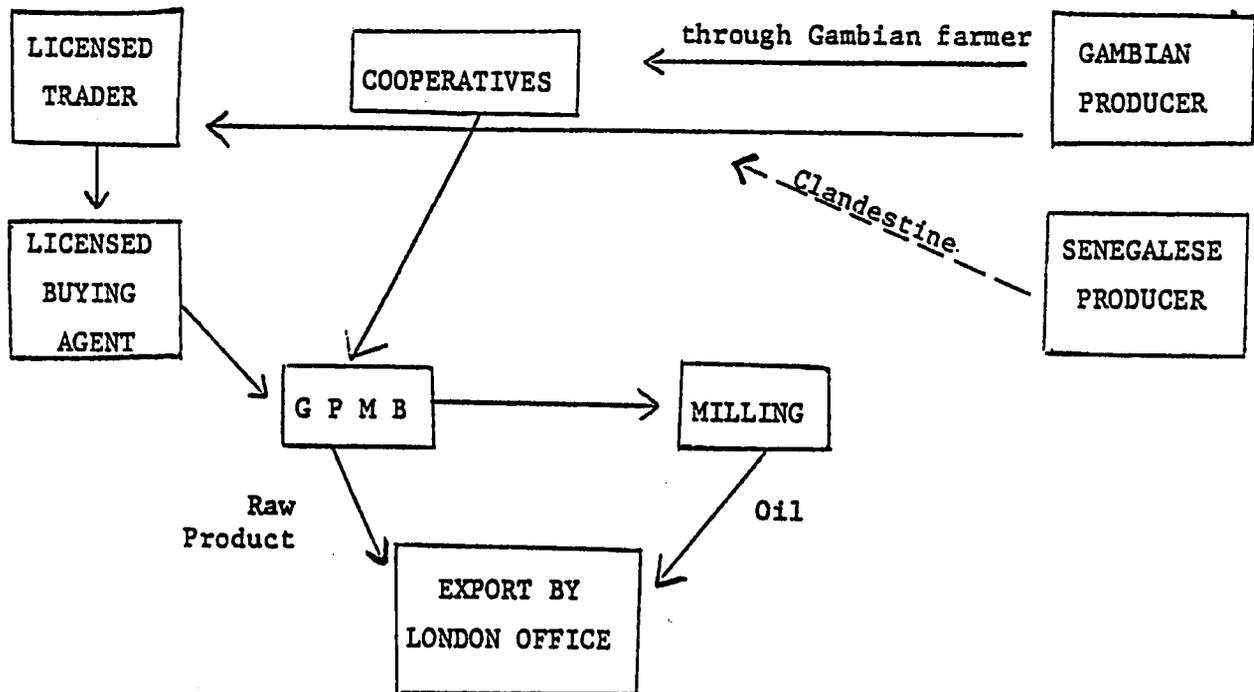
##### A. Groundnuts

As previously stated, the GPMB has a legal monopoly for the purchase and export of groundnuts. To collect these groundnuts from the producer, the GPMB uses both licensed buying agents (LBAs) and the cooperatives. The producer has the discretion in choosing to whom he sells; however, only members may sell to the cooperatives. While the producer receives the same controlled price from both market agents, there are advantages, depending on the producer's individual situation, in dealing with each. The cooperative offers the producer relatively low interest, subsistence credit (the amount of which is a function of his previous sales) and the delivery of fertilizers. The private trader, on the other hand, often offers the producer free pick up of his produce (saving the farmer the time and expense of bringing the product to the cooperative buying stations), credit even when a greater risk, and food on credit during the "hungry months" of July, August and September. Both the LBAs and the cooperatives provide the producer with seeds at a price set by the GPMB.

The LBAs themselves license and utilize traders who make purchases for the LBA. The GPMB then purchases all groundnuts collected by the LBAs and cooperatives. At that point, the GPMB must decide between the portion of the crop it wishes to transform into oil before export and that portion it exports directly. It bases this decision primarily on profit maximizing criteria, weighing the relative world prices of the transformed and the raw product.

In general, the groundnuts are transported by the purchasing agent to Produce Depots located along the Gambia River. The Gambia River Transport Co., a subsidiary of the GPMB, then transports the products by barge either to the mills or directly to Banjul for export. As should be obvious, the GPMB has complete control of the groundnut operation from the purchase at the farm level to the exporting. Diagram I illustrates this marketing chain.

Diagram I. Groundnut Marketing



The following chart shows the evolution of the cooperative into the leading buying agent. The situation has remained relatively static since the 1973/74 season, with the cooperatives still controlling about 45% of sales. As previously stated, government policy appears to be heading towards legalizing the cooperatives as the sole buying agent. In that case, the cooperatives would be required to more than double the quantity of groundnuts which they purchase.

Table XIII. GROUNDNUTS  
PERCENTAGE COMPARATIVE BUYING AGENTS' DECLARED PURCHASES  
(1964/65 - 1973/74)

<i>Buying Agent</i>	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74
M. Njie & Sons Ltd ...	—	—	—	—	—	—	—	—	5.87	13.03
C.G.I.E.T. Co. ...	—	—	—	—	—	—	—	1.27	1.29	2.00
U.A.C. Ltd. ...	23.67	24.51	22.55	25.86	28.51	31.37	28.17	—	—	—
S. Madi Ltd. ...	20.85	19.07	20.80	18.40	19.63	19.70	22.95	33.65	32.16	27.68
C.F.A.O. ...	6.87	9.21	6.12	5.72	6.04	5.09	5.52	6.47	4.63	3.23
Maurel Prom ...	5.94	7.45	7.29	7.08	6.40	7.29	11.25	12.67	12.17	7.99
Maurel Freres ...	6.68	5.83	6.04	6.70	5.57	4.91	4.27	3.33	—	—
Le Cornaf. ...	4.27	—	—	—	—	—	—	—	—	—
Vezia Ltd. ...	4.73	5.16	5.86	5.10	4.14	5.87	—	—	—	—
Co-operatives ...	26.99	28.77	31.34	31.14	29.71	25.77	27.84	42.61	43.88	46.02
	100	100	100	100	100	100	100	100	100	100

SOURCE: GPMB, Annual Report, 1973/74. P. 42

The quantities of groundnuts purchased by the GPMB during the preceding seasons are as follows:

Table XIV. GPMB Groundnut Purchases (tons)

<u>64/65</u>	<u>65/66</u>	<u>66/67</u>	<u>67/68</u>	<u>68/69</u>	<u>69/70</u>	<u>70/71</u>	<u>71/72</u>
90,953	117,968	126,314	117,023	119,871	110,396	113,225	122,532
	<u>72/73</u>	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>		
	100,376	134,562	135,600	133,000	135,000*		

\*estimate

SOURCE: GPMB

Some portion of these annual purchases by GPMB undoubtedly include groundnuts from Senegal that have been illegally transported over the border. This has traditionally occurred if the Gambian producer price exceeds the Senegalese price or if the Gambian buying season opens in advance of the Senegalese "campaign."

#### Pricing Policy for Groundnuts

The price offered by the buying agent is a price fixed by the Gambian government. The procedure by which the price is determined involves consultation between the GPMB and the appropriate government agencies. In general, the GPMB receives from its London office an estimate of world prices for the coming campaign. With the estimated world price and its projections of crop availability, the GPMB recommends a price to the cabinet of the Gambian government. This recommendation is based on several criteria, including avoidance of destabilizing movements in the producer price and the profitability of the GPMB. The cabinet then approves or modifies the price recommendation of the GPMB. With the producer price determined, the legal margins for both the LBAs

and the traders are set in the same manner. These margins are set to cover all costs and to provide a fair rate of return to the agent. The cooperative also receives this margin for its sales. While incomplete, the following figures give an indication of the magnitude of these margins.

Table XV. Groundnut Trading Margins  
(Dahsis/ton)

	<u>1972/73</u>	<u>1973/74</u>	<u>1976/77</u>
<u>LBA:</u>			
Fixed Overhead	8.41	8.41	
Variable Expenses	2.69	3.10	N.A.
Profit Margin	2.75	3.15	
TOTAL:	13.85	14.64	20.84
<u>Traders:</u>			
Cost of Labor	8.52	9.80	
Cost of Bags	3.18	3.18	N.A.
Loss in weight allowance	3.00	3.46	
Profit Margin	2.75	3.15	
TOTAL:	17.45	19.59	27.87

The official producer prices, as well as the GPMB average sale prices for the 1964/65 - 1976/77 campaigns, are listed on the following page.

Table XVI. Producer and Export Prices of Groundnuts  
(Dalasis/ton)

	<u>64/65</u>	<u>65/66</u>	<u>66/67</u>	<u>67/68</u>	<u>68/69</u>	<u>69/70</u>	<u>70/71</u>	<u>71/72</u>
Producer Price	135	140	140	135	140	150	170	180
Sale Price	340	320	305	270	370	380	479	446
			<u>72/73</u>	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	
Producer Price		200	230.40	310.40	370.40	408		
Sale Price		491	789	N.A.	752.9	1050*		

\* estimate  
SOURCE: GPMB

As is evident from the chart, the producer price for groundnuts was relatively stable until the late 1960s. Since 1968/69, however, steady annual increases have occurred. These have been of the magnitude of 15%, 35%, 20% and 10% for the last four years. As previously stated, these substantial and continual increases in groundnut prices have encouraged the farmer to concentrate land and labor resources less on traditional cereals crops and more on the relatively more profitable groundnuts.

The above combination of producer price and average selling price, after considering all costs to the GPMB, resulted in the following annual profits:

Table XVII. GPMB Groundnut Profits  
(000's Dalasis)

<u>64/65</u>	<u>65/66</u>	<u>66/67</u>	<u>67/68</u>	<u>68/69</u>	<u>69/70</u>	<u>70/71</u>	<u>71/72</u>
1,871	998	-59	-1,635	4,983	3,794	10,150	7,048
		<u>72/73</u>	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>	
		6,275	34,848	N.A.	-1,600	16,000*	

\* estimated  
SOURCE: GPMB

The annual profit, as previously discussed, is divided among the stabilization fund, the general fund, and grants to the Agriculture Department and the Government Development Fund. The profit has also been used to finance subsidies on fertilizer and imported rice. In years of loss, the stabilization fund is used to subsidize the GPMB's operations.

#### B. Millet and Sorghum

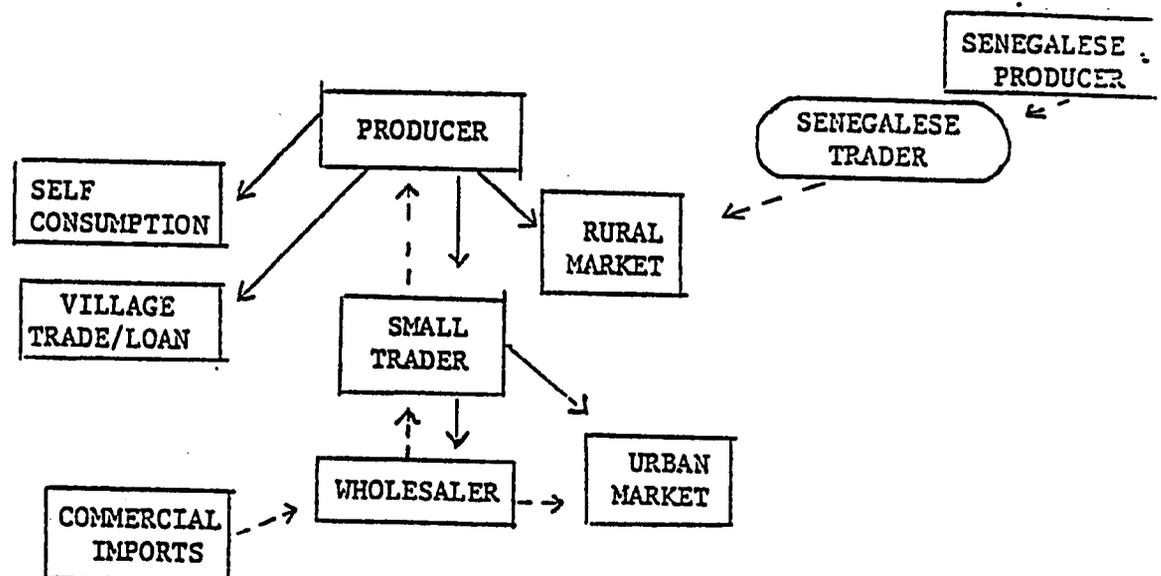
For both millet (Suno and Sanyo) and sorghum, a small scale traditional marketing system exists. There is no legal or actual intervention by any government agency in the marketing of these crops. The basic actors in this marketing process are the producers, small traders, a few wholesalers, and the retailers. As discussed in the section on agriculture production, the annual Gambian production of millet and sorghum is in the order of 35-40,000 tons - 13,000 tons of sorghum and 22,000 tons of millet in 1975. Of this production perhaps as little as 10% reaches any commercial channels. To this figure, of course, must be added imports of millet and sorghum by wholesalers, recorded at 5000 tons in 1976, and clandestine imports by small Senegalese traders.

In essence, it appears that the amount of millet and sorghum marketed in the Gambia approximates 10,000 tons. As previously emphasized, current market prices induce a farmer to maximize his groundnut production and, if necessary, purchase cereals, including imported rice. There appear to be few farmers who consciously plant millet and sorghum as a commercial venture. The local millet and sorghum which is commercialized is primarily done by farmers who possess, perhaps due to an unexpected harvest, a surplus above their estimated consumption needs or by farmers whose cash needs compel them to sell millet and sorghum.

Millet and sorghum is supplied to larger urban markets (Banjul, Basse, or Georgetown) primarily by small traders who purchase an occasional bag or two from peasants desiring to sell. Peasants within close proximity of these markets bring their product directly there. At the village level, millet and sorghum are marketed by the peasant himself either on a cash or barter basis. Also, it is common within a village for a peasant to lend grain to another peasant during the "hungry" months of July, August, and September. This loan is then repaid with millet or sorghum at harvest time.

Diagram II attempts to show the above-mentioned market channels.

Diagram II. Millet and Sorghum Marketing



The solid arrows indicate flows of domestically produced millet and sorghum. The producer is likely to sell to a small trader who either supplies an urban market or sells to a wholesaler. An FAO expert estimated that there are perhaps 2 or 3 Gambian wholesalers of millet and sorghum. They each handle only 50-100 bags monthly or perhaps, at most, 100 tons annually. With an estimated 3500 - 4000 ton domestic market, the wholesaler thus plays a minor role in the Gambia. This should not be a surprising result. The amount of millet marketed is small. The Gambia is a small country with an adequate transport system. The small trader, or in some cases the farmer himself, can easily supply the market directly. The wholesaler does not have an obvious function in this process. Small traders who do not have a ready retail market and desire cash are likely to sell to the wholesaler who is in a better position to perform the storage function, having sufficient capital assets to finance a storage and resale operation.

The broken arrows in Diagram II indicate flows of imported millet and sorghum. As previously explained, commercial imports totaling 5000 tons were recorded in 1976. Wholesalers generally utilize small traders to sell some of this millet and sorghum to farmers who had inadequate personal grain supplies. Also wholesalers supply the urban markets with these imports. Imports from Senegal by small traders and producers themselves are primarily part of the traditional Gambia/Senegal border trade that responds to price differentials between the two countries.

This millet and sorghum is generally consumed in villages near the border and is distinctly separate from the larger commercial imports previously discussed. It is impossible to estimate the quantity of millet and sorghum that is involved in this clandestine trade. However, Senegalese authorities feel that this year (1976/1977) a marked increase can be observed due to price increases in millet and sorghum occurring in the Gambia.

Having identified the primary flows of millet and sorghum, an analysis of the pricing process is in order. Prices for millet and sorghum are uncontrolled in the Gambia and respond to market forces. While recorded prices in major consumer markets exist, the prices actually paid to various agents in the market-chain are difficult to ascertain. The following chart shows monthly millet and sorghum prices in the Banjul market from July, 1974, to October, 1976. These are prices actually paid by the consumer for 1/2 kilo of millet and sorghum.

Table XVIII. Banjul - Millet & Sorghum Prices  
Butus/500 grams

	<u>Jan.</u>	<u>Feb.</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
<u>1974</u>												
Millet							15	15	15	14	14	14
&												
Sorghum							14	14	13	15	16	13
<u>1975</u>												
Millet	17	14	14	14	15	13	15	15	18	18	18	18
&												
Sorghum	16	13	15	14	14	14	15	16	17	17	18	24
<u>1976</u>												
Millet	25	27	27	27	27	28	29	29	29	29		
&												
Sorghum	19	26	26	26	26	28	29	29	29	NA		

SOURCE: Division of Statistics

A more geographically complete analysis of millet/sorghum prices can be found in the appendix.

Certain conclusions emerge from this table and those in the appendix. Firstly, neither seasonal nor geographic variation among consumer prices seems significant. Secondly, from July of 1974 to October of 1976, prices have doubled, increasing in a smooth and continuous fashion. The lack of geographic variation can certainly be explained by the relatively small size of

the Gambia and its good transport system. Geographic price differentials would certainly prompt movements of millet and sorghum to areas of high price, and prices would tend to be equalized.

The lack of seasonal variation in price can primarily be attributed to the presence of imported rice, in sufficient quantities throughout the year, at a constant price. During the months when millet and sorghum are in short supply (June-October) and prices would normally increase, consumer demand is shifted to rice. Some unofficial estimates do, in fact, show a marked increase in rice sales during the summer months. Since the rice is sold at a controlled price, with supplies released by the GPMB as needed, the increase in consumer demand for rice does not induce a corresponding increase in rice prices.

The steady increase in millet and sorghum prices can be attributed to two phenomena. The first is simply an overall inflationary trend in the economy. Steady increases in purchasing power, caused by higher groundnut incomes, have contributed to demand pull inflation. Secondly, with losses due to pests and poor rains, as well as shifts of labor and land to groundnuts, the supply of marketed millet and sorghum has been either constant or falling. Thus, with slightly increasing rice prices, small demand increases for millet and sorghum due to population growth will induce slight price increases in millet and sorghum.

The above prices are consumer prices for millet and sorghum and do not necessarily represent prices paid to the farmer. However, since much of the millet and sorghum can be brought by peasants themselves to neighboring markets, it would seem that the farmer must receive a high proportion of the consumer price.

If the price of 45 Dalasis/90 kilo bag can be used as an estimated wholesale price, the following price chain could be valid.

Table XIX. Millet Price Structure (October 1976)  
(Butus/Kilo)

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Price to Consumer	58
Price to Retailer	50
Price to Wholesaler	—
Price to Farmer	33*

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\* Agricultural Department Estimate

The retailers margin would be 8 Butus, or 6%. The Agricultural Department estimates a farmer price of 33 Butus/kilo. This would suggest that 17 Butus are shared by the trader and the wholesaler. Unfortunately, there is no way to adequately estimate the division of this margin. Also, an analysis of this type is complicated by the fact that no clear division of these functions exists. In many cases, the wholesaler is completely bypassed, with the small trader bringing the millet and sorghum directly to the retailer. In that case, the small trader would receive the whole margin (50 - 33) of 17 Butus.

An important consideration in millet/sorghum marketing is the profitability per acre for the farmer growing millet or sorghum, as compared to the alternative of groundnut production. The following table presents estimates along these lines.

Table XX. Millet Sorghum, Groundnut Profitability  
(Currency: Dalasis)

	<u>Millet or Sorghum</u>	<u>Groundnut</u>
Yield/acre (lbs.) :	600*	1100
Price to farmer (Butus/lb) :	13	18.5
Total Revenue :	78	203.5
Variable Cost		
Inputs	3.25	7
Labor	72.5	100
Depreciation & hand tools	<u>3</u>	<u>3</u>
Total Cost	78.75	110
Return to capital/management	- .75	93.5

\* average of millet and sorghum

SOURCE: Department of Agriculture estimates

As is evident, millet and sorghum, after costing labor, have a negative return.<sup>1</sup> In contrast, the per acre return from groundnuts is 93.5D. Thus, it is quite understandable that the farmer is attempting to intensify his production efforts towards groundnuts. With the current groundnut price and low yields for millet and sorghum, the farmer would need to receive a price of 71B (76 CFA) per kilo for millet or sorghum to induce him to plant millet or sorghum instead of groundnuts. Obviously, without substantial increases in yields, millet and sorghum production for a commercial market is not feasible given current relative prices.

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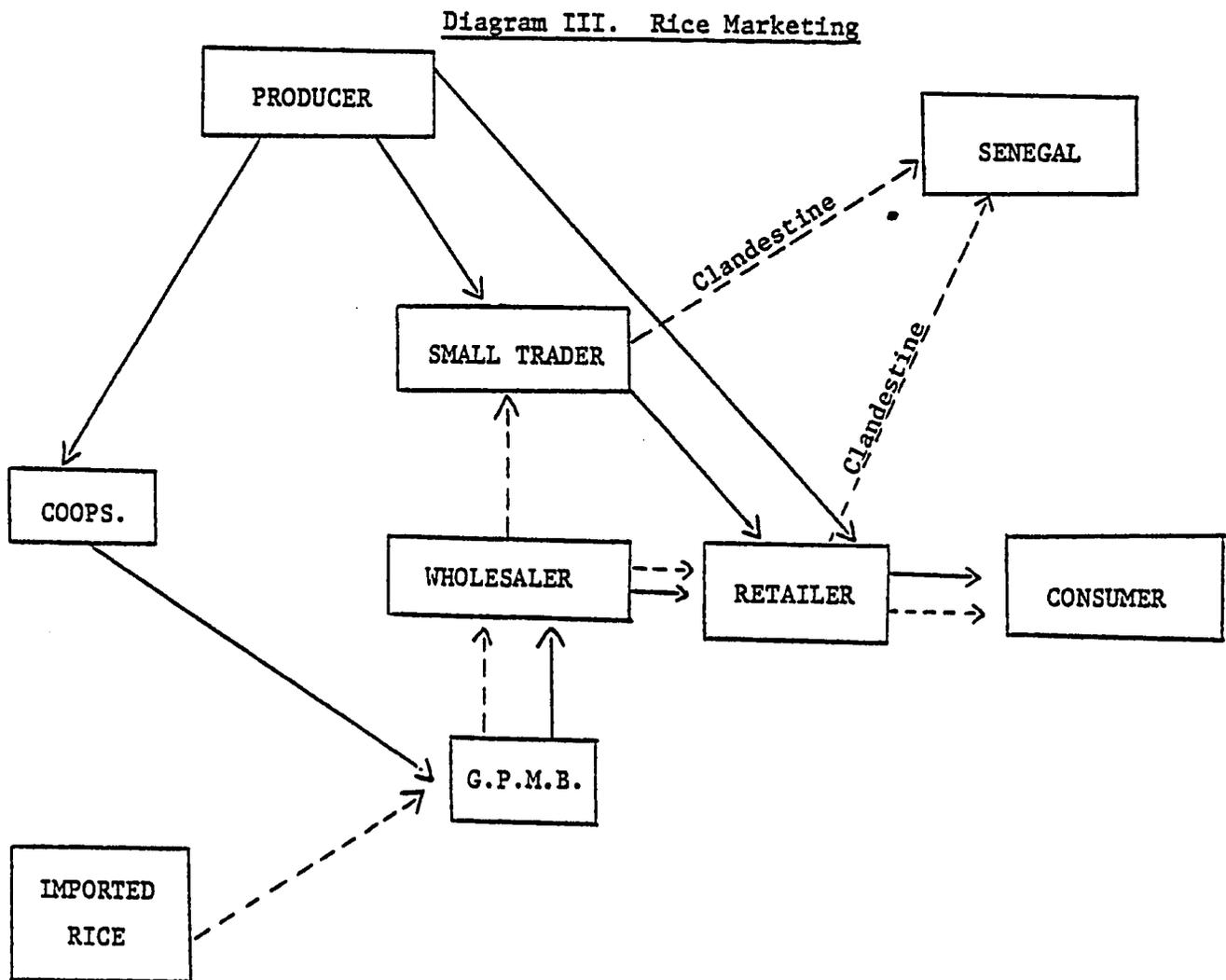
<sup>1</sup>This, of course, doesn't mean that the peasant growing millet actually loses cash income. It means that if his labor costs were paid at the rate assured in the table, the return per acre to millet production would be negative.

This section has identified the agents in the limited millet and sorghum market, analyzed recent price trends for millet and sorghum, estimated margins for each of the agents, and finally presented some estimates of the per acre profitability for the farmer of growing millet or sorghum.

C. Rice

This section will attempt to identify the market channels for both local and imported rice, analyze recent price trends, and calculate the profitability for the farmer growing rice.

The following diagram traces the flows of both domestic and imported rice.



The solid arrows represent flows of domestic rice, broken arrows represent flows of imported rice.

The procedure by which the GPMB imports rice for Gambian consumption was explained in Chapter II. GPMB releases rice to wholesalers, who in turn sell to the retailers supplying the consumer. As shown in Chapter II, imports of rice for this year are estimated at 34,000 tons, representing about 31% of Gambian grain consumption. About 30% of the imported rice is sold outside of Banjul, representing consumption by rural farmers who are not self-sufficient in food grains and the clandestine imports to Senegal. The allowable margins for wholesalers and retailers are also explained in Chapter II. The price of rice has often been lower in the Gambia than in Senegal, inducing Senegalese traders to buy imported rice in the Gambia for resale in Senegal. Currently, Gambian authorities have increased the rice price in the Gambia, reducing the clandestine rice flows.

As stated in the last section, the sale of imported rice, particularly in rural areas, is higher during the "hungry" months of June, July, August and September when millet/sorghum is not generally available. This, as stated, tends to stabilize millet and sorghum prices. Figures from the Sapu area confirm this; the GPMB sold the following monthly quantities to wholesalers in that area.

Table XXI. Imported Rice Sales, Sapu

July (1976)	1650-(160 lb. bags)	317 (220 lb. bags)
Aug.	2290	924
Sept.	2290	
Oct.	2290	
Nov.	700	
Dec.	very little (uncompleted figures)	

SOURCE: Gambian Authorities

When millet and sorghum become available in late November, sales in rural areas significantly drop until the following spring when farmers

have exhausted their supplies. The presence of imported rice in sufficient quantities permits the farmer to reduce his own production of food grains and tends to stabilize millet and sorghum prices during the year.

Domestic rice production is about 30,000 tons, primarily autoconsumed. A general preference for the imported rice by consumers tends to limit marketing of domestic rice. As the preceding chart indicates, the GPMB is a legal purchaser of rice. The GPMB, after purchasing domestic paddy, mills the rice at Kuntaur and releases the domestic rice with the imported rice. Often the two types of rice are mixed together. Purchases by the GPMB of local rice are very small, amounting to around 700 tons annually in the last few years. With the current low world price for rice and the GPMB's high milling costs for domestic rice, the domestic rice operation is unprofitable for the GPMB. Some local rice is hand-pounded and sold by peasants to traders for sale in rural markets or, very commonly, the peasant brings his hand-pounded rice to market for direct sale. The FAO has estimated that 25% of locally grown rice, or 7500 tons, is marketed. If the GPMB handles 700 tons, the private sector markets in excess of 90% or 6800 tons.

The GPMB currently offers a guaranteed price of 18 Butus/lb. or 40 Butus/kilo (42 CFA/kilo). This represents an increase from 14 B/lb. the two previous years, and 13 B/lb. during the 73/74 season. However, it is suggested that traders pay between 18 B and 20 B/lb., explaining why the large majority of commercial rice is marketed outside of the GPMB. Farmers going directly to market would, of course, receive a higher price per pound, one approaching the consumer price. For the Banjul market, the prices for domestic and imported rice are as follows:

Table XXII. Banjul Rice Prices  
(Butus/500 grams)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
<u>1974</u>												
Imported Rice							23	24	23	23	24	26
Local Rice							24	NA	NA	23	23	NA
<u>1975</u>												
Imported Rice	30	29	32	30	30	31	30	30	30	30	30	30
Local Rice	34	NA	30	30	30	28	32	32	32	30	31	30
<u>1976</u>												
Imported Rice	30	30	30	30	30	30	30	33	33	33	33	
Local Rice	NA	30	NA	32	32	32	NA	NA	35	NA		

SOURCE: Division of Statistics

In the appendix, a more geographically complete table of consumer rice prices can be found.

It should be noted that most domestic rice is consumed up-country near producing areas and not in Banjul. The price of imported rice has steadily risen from 23 Butus per 1/2 kilo to 33 Butus per 1/2 kilo (69 CFA/kilo) in Banjul. This is consistent with the GPMB's policy to end the subsidization of imported rice. This year, a falling world price and a slightly increased consumer price will allow the GPMB to break even on its imported rice operations, after years of subsidization. There is a slightly higher price for imported rice outside of Banjul, representing the average transport costs from Banjul where the imported rice is delivered. The rice price is a fixed and controlled price. The Price Control Unit's agents are charged with its enforcement. It is primarily enforceable, however, because the GPMB makes available sufficient quantities at that price to satisfy demand. On occasion, when transport problems or late deliveries have interrupted the normal flow of imported rice, deviations from the controlled price have been observed.

The domestic price of rice very closely follows the imported price of rice. Since the imported rice is viewed as a satisfactory substitute, and preferred by some consumers to local rice, it would be economically impractical for the prices to diverge.

The Agriculture Department has estimated the profitability per acre for upland and rainfed rice to be as follows:

Table XXIII. Rice Profitability

	<u>Upland Rice</u>	<u>Swamp Rice</u>
Yield per acre (lbs)	800	1200
Price to Farmer (B/lb)	20	20
Total Revenue	160	240
Variable Costs		
Inputs	10.80	8.00
Labor	88.00	97.00
Depreciation on tools	1.60	1.60
Total Cost	100.40	106.60
Return to capital/management	59.6	133.40

SOURCE: Dept. of Agriculture estimates

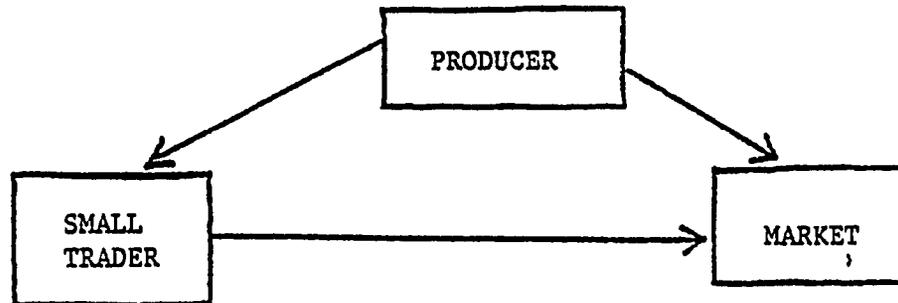
Thus, in contrast to millet and sorghum production, rice, particularly swamp rice, provides an attractive per acre profit. The problems with further expansion of swamp rice, as discussed in Chapter II, are the salinity content of the Gambia River and poor access to fields. Thus, the expansion of the profitable swampland rice is primarily constrained by the lack of additional land with the same productivity. The future of commercial rice in the Gambia revolves around a resolution of the above technical problems and the pricing policy of the GPMB for imported rice. The price for domestic rice cannot diverge significantly from that for imported rice. The price which the farmer receives for rice, an important determinant in the production decision, is integrally associated with the

price of imported rice. Consequently, the profitability of needed investments to increase available swampland is contingent on the world rice price,

D. Maize:

There appears to be little commercial marketing of maize; perhaps 5% of the 12,000 tons annually cultivated is marketed. The quantity marketed is either brought to market directly by the peasant or collected by the small trader.

Diagram IV. Maize Marketing



For peasants within close proximity of a market, the small trader is bypassed, with the peasant receiving the small traders' margin. For delivery to Banjul, the trader collects small quantities from peasants and provides the transport function.

The primary hindrance to an expanded maize market is the lack of acceptance of maize by the consumer as a staple food. For this reason, demand in the urban centers, where rice is preferred, is not significantly great to stimulate a more extensive cultivation of maize.

At current prices, groundnut production is considerably more profitable than maize on a per acreage basis. In fact, very little price information seems to exist for maize. The estimated producer price is 12.5 Butus per

pound, with a consumer price of 15-18 Butus per pound. The estimated profitability for maize production is as follows:

Table XXIV. Maize Profitability  
(Currency: Dalasis)

Yield per acre	1000
Price (Butus/lb)	12.5
Total Revenue	125
Variable Cost	
Inputs	5
Labor	66.5
Depreciation	3
Total Cost	74.5
Return on Capital and Management	50.5

SOURCE: Department of Agriculture Estimate

While some expansion of maize production for commercial purposes has recently been observed, the problem of consumer acceptance imposes very definite limits to the degree of this extensification.

#### E. Benefit/Cost of Food Self-Sufficiency

Having identified relatively greater groundnut profitability as the source of the Gambia's lack of food self-sufficiency, it would now be instructive to scrutinize more closely the benefits and costs of food self-sufficiency. With their integration into the world economy, the Gambia is pursuing a strategy of exporting groundnuts and importing rice. The following exercise attempts to evaluate the economic rationality of replacing imported rice with domestically produced rice.

The underlying assumption is that swampland in cultivation along the Gambia River can be expanded to meet the needed increase in domestic production. Obvious problems of access to the fields and, more importantly, excess salinity should not be ignored. This exercise, however, will assure

that the supply of rice land equal in productivity to present rice land is limitless. This analysis thus neglects potential costs of bringing new rice land into cultivation. The cost figures for expanded rice production in this exercise should be considered as minimum costs.

It is further assumed that to expand rice production, labor must be reallocated from groundnut production to rice production. In that case, the benefit from eliminating rice imports must be compared to the cost of reduced groundnut production and export.<sup>1</sup>

Currently, it is estimated that the 1976/77 Gambian production of cereals will satisfy 58% of national needs. Imported rice (34,000 tons) constitutes 31% of national needs. Together, domestic cereals production and imported rice satisfy 90% of Gambian cereal requirements. Thus, a complete replacement of imported rice by locally produced rice would permit the Gambia to be nearly self-sufficient in cereals production.

Current yields of swamp rice are said to average 1500 pounds per acre. Assuming that current yields could be maintained on the expanded acreage, a risky assumption given the problems of access and salinity, an increase of 69,744 acres in swamp production would be needed to produce 34,000 tons of edible rice. This assumes a transformation figure of paddy to edible rice of .65. This represents a 127% increase over current rice acreage. An acre of swamp rice demands 91 D of labor, as estimated by the Department of Agriculture, and an acre of groundnuts 100 D of labor. Consequently, an

---

<sup>1</sup>The analysis could be put in terms of sacrificed future increases in groundnut production rather than in terms of reductions of present output. That is, expansion of rice production will require resources which could go to expanding groundnut production—labor, investment funds, research, manpower, etc.

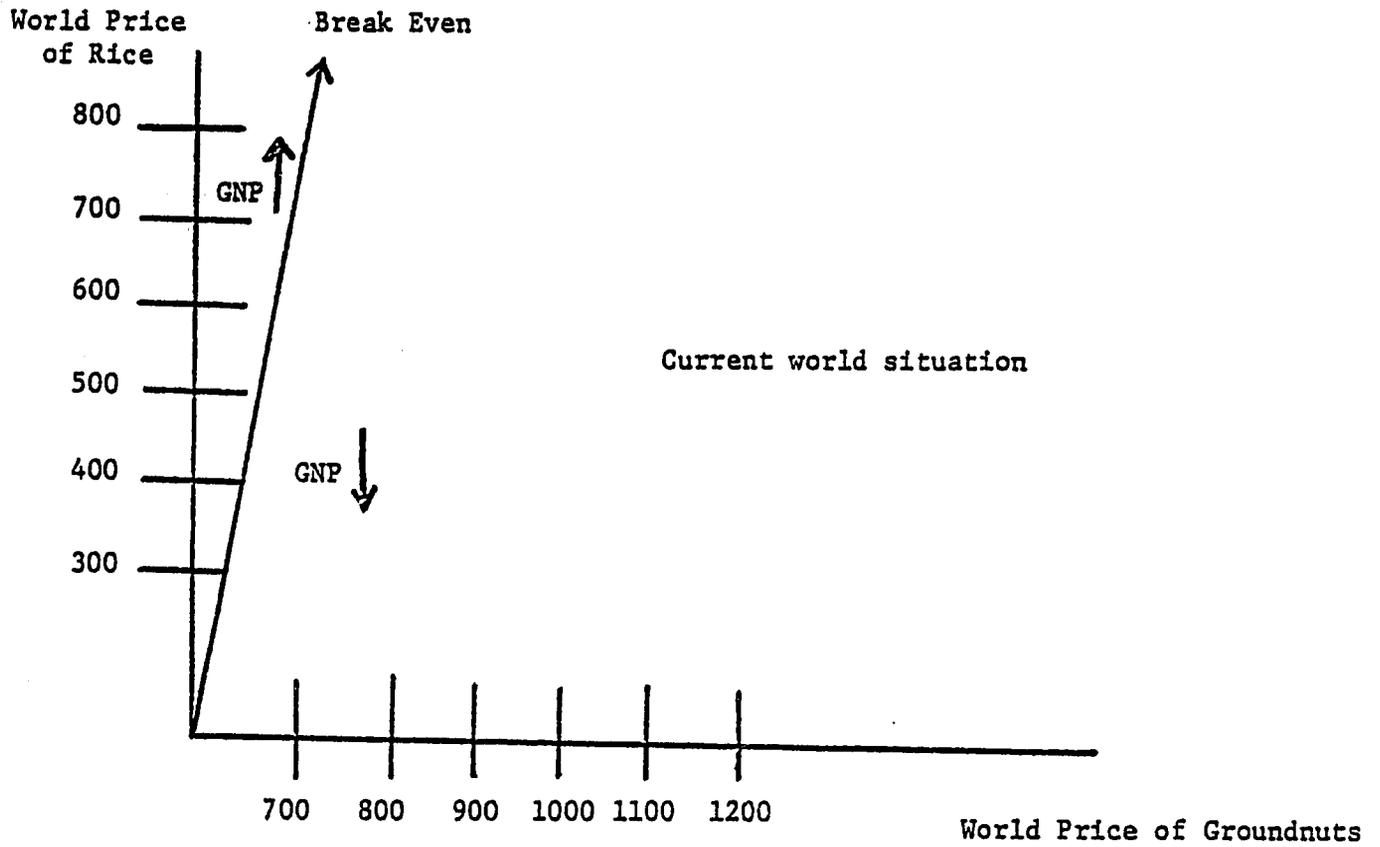
increase in one acre of rice necessitates a decrease in groundnut surface by .91 acres. Thus, an increase of 69,744 acres of rice demands a reduction of 63,467 acres of groundnuts. Assuming an average yield of 1150 pounds per acre for groundnuts, groundnut production would fall by 33,176 tons, or 25% of current production. This analysis suggests that the replacement of 35,000 tons of imported rice by domestic production could cost, at minimum, 33,176 tons of groundnuts. The economic cost/benefit of such a strategy obviously depends on the world prices of rice and groundnuts, the total benefit on the above strategy. The figures shown represent the sum of rice import savings plus groundnut earning losses at various world prices for both products. In other words, the Gambian GNP (185 million dalasis in 1975) would be increased or decreased by the amounts shown in the table.

Table XXV. Savings by Replacing Imported Rice  
(Changes in GNP, 000's Dalasis)

World Price of rice/ton in Dalasis	World Price of groundnuts/ton in Dalasis						
	700	800	900	1000	1050	1100	1200
300	-13,019	-16,335	-19,660	-22,976	-24,629	-26,302	-29,647
350	-11,319	-14,635	-17,960	-21,276	-22,929	-24,602	-27,947
400	-9,619	-12,935	-16,260	-19,576	-21,229	-22,902	-26,247
500	-7,019	-9,535	-12,860	-16,176	-17,829	-19,502	-22,847
550	-4,523	-7,801	-11,158	-14,476	-16,129	-17,802	-21,147
600	-2,823	-6,141	-9,458	-12,776	-14,429	-16,102	-19,447
700	+557	-2,741	-6,058	-9,376	-11,029	-12,702	-16,047

As previously stated, the above figures must be considered minimum costs for a strategy of replacing rice imports. It is not possible to expand swamp rice land with constant yields to the acreage needed. Secondly, rice milling costs, both variable and fixed, have not been included in this calculation. Nevertheless, the figures are indicative. At current world price levels for groundnuts and rice, complete (90%) self-sufficiency would be very costly to the Gambia. The GPMB estimates this year an export price of 1050 D per ton of groundnuts; at that groundnut price, a self-sufficiency strategy based on rice import substitution is not economically sound in this analysis within a reasonable range of working prices. At the current world price of 500 D a ton for rice, the Gambia's GNP would be reduced by 17,829,000 D with the complete self-sufficiency strategy. The following graph shows the world price ranges for groundnuts and rice at which the self-sufficiency strategy would be profitable.

Diagram V. Benefit/Costs of Food Self-Sufficiency  
(Dalasis/ton)



$$\Delta \text{GNP} = P^{\text{Rice}} \times 34,000 - P^{\text{Groundnuts}} \times 33,176$$

Along the line  $\Delta \text{GNP} = 0$

$$\text{Thus, } \frac{P_G}{P_R} = \frac{34,000}{33,176} = 1.03$$

For any world price ratio,  $\frac{P_G}{P_R}$ , in excess of 1.03, a strategy of replacing rice imports lowers GNP; for any world price ratio below 1.03, replacing rice imports increases GNP.

This analysis shows that current world prices could significantly alter in an adverse direction for the Gambia, without diminishing the economic advantage of the Gambia's specialization in groundnut production. For the Gambia, then, a strategy of cereals self-sufficiency, with its resulting loss of groundnut production, involves potentially significant economic costs. Any technological change reducing costs of rice production or the availability of capital for rice production, which has little or no opportunity cost, would reduce this cost.

This analysis, in any event, is strictly economic.

F. Summary

Currently, within the Gambia, a well-defined market for groundnuts exists with legal control vested in the GPMB. For domestic rice, commercial activity is also significant, with both private trade and the GPMB acting as guaranteed purchasers. Most rice, however, due to more favorable prices, is handled by the private trade. Finally, in millet, sorghum, and maize, a traditional private marketing system exists. Small quantities are commercialized by peasants and small traders, and there is a limited role for the wholesaler in the Banjul area.

The producer prices (Butus per pound) for the above-mentioned crops are, for the last few years, the following:

Table XXVI. Producer Prices  
(Butus per pound)

	<u>73/74</u>	<u>74/75</u>	<u>75/76</u>	<u>76/77</u>
Groundnuts *	11	14	17	18.6
Rice *	13	14	14	18
Millet/ Sorghum	N.A.	9	10	13
Maize	N.A.	N.A.	N.A.	12.5

\* Guaranteed price

SOURCE: GPMB and Dept. of Agriculture

Based on the 1976/77 prices, the profitability per acre for each crop is as follows:

Table XXVII. Per Acre Profitability  
(Currency: Dalasis)

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Groundnuts	93.5
Rice (Upland)	59.6
Rice (Swamp)	133.40
Millet/Sorghum	-.75
Maize	50.5

---

SOURCE: Department of Agriculture Estimates

The central fact in the Gambian situation is that groundnut production per acre is considerably more profitable than grain production. While swampland rice is also very profitable per acre, its further development is plagued by problems of access and salinity. In addition to the greater profitability for groundnuts, a guaranteed and efficient market for the product exists with the GPMB. For millet, sorghum, and maize, no guaranteed market exists and the marketing risks must be borne by the producer. For the above reasons, it should be evident why the Gambian farmers' efforts have been diverted to groundnut production at the expense of traditional cereal crops.

Finally, a simple exercise showed that the strategy of exporting groundnuts and importing rice leads to a higher level of money income. Under existing technological conditions, at current world prices for groundnuts and rice, and more importantly, within foreseeable prices ranges for these products, a replacement of imported rice by domestically produced rice (given the labor constraint) would lower GNP. The economic losses from reduced groundnut production and exports exceed the savings on reduced rice imports.

## V. STORAGE

Storage of cereals is a rather decentralized operation, the control of which depends on the cereal in question. All imported rice and the small quantity of local rice purchased by GPMB are stored in GPMB-owned warehouses. The GPMB releases this rice, on demand, to licensed wholesalers. Millet and sorghum are stored by farmers themselves at the village level. On-farm storage, either the circular mud block granary with thatched roof or the bamboo granary, was judged to be relatively efficient by a recent Tropical Products Institute mission to the Gambia. Losses were estimated at less than 20%. As previously stated, very few Gambian farmers are self-sufficient in these crops. Thus, village stocks of millet and sorghum become exhausted between the months of June through October. The few wholesalers of millet and sorghum in the Banjul area store their small quantities at their own establishments. Cereals entering the Gambia through international donor agencies are stored in warehouses administered by various local government agencies. When deliveries exceed local capacity, commercial storage can be rented.

Table XXVIII shows the cereals storage capacity currently available.

The local seed stocks should be included in an inventory of storage capacity. While intended for storage of groundnut seeds, farmers may store millet and sorghum there. Also, with any growth in millet and sorghum marketing, these seed stores could become a vital storage link in the marketing chain.

Table XXVIII. Storage Capacity for Cereals  
(tons)

<u>Owner</u> <u>Warehouses</u>	<u>Capacity</u>	<u>Location</u>	<u>Use</u>
GPMB	1000	Banjul	Rice (Imported)
GPMB	1000	Banjul	" "
GPMB	1500	Banjul	" "
GPMB	1500	Banjul	" "
Ministry of Education	400	Campama	Food Aid
Ministry of Local Government	500	Yundum Airport	Food Aid-WFP
	300	Mansakondo	" "
	300	Kaur	" "
	300	K.B.K.	" "
	300	Basse	" "
	300	Basse	" "
	300	Kerewan	" "
Agricult. Dept.	300	Yundum	Food Aid
Customs	1000	Banjul	Short Term Cereal
GPMB*	2000	Banjul	Rice
GPMB*	3000	Kuntaur	Cereal
<u>Silos</u>			
GPMB	500	Kuntaur	Bulk Paddy
GPMB	400	"	Bulk Paddy
Total Capacity: 14,900			

\*(This is storage recently built following the recommendation of the Tropical Products Institute's mission in 1975 to study storage problems in the Gambia. The 2000 ton capacity at Banjul was available in Jan., 1977, and the 3000 tons for Kaur in Feb., 1977.)

SOURCE: Department of Agriculture

Existing cereals storage in the Gambia (leaving aside on-farm storage) is primarily warehouse capacity. In that sense, this above list of potential cereals storage capacity is underestimated, as commercial warehouse space can always be rented to store cereals. The storage capacity is concentrated in the Banjul area, reflecting the need for post-delivery storage of imported rice and food aid, preceding transfer to other parts of the country. As most imported rice is consumed in Banjul, extensive up-country storage is not necessary. This existing placement of storage could pose problems if the Gambia developed a more extensive system for marketing of locally produced food grains. Existing capacity is centered around the consuming area of Banjul and not the producing areas.

While much of this storage capacity is in poor condition, we were informed that losses are not excessive, though no estimate is available. The Agriculture Department's Crop Protection Unit (C.P.U.) inspects all food grains entering the country, with apparent efficiency. When insect problems are discovered, fumigation and spraying is done by the C.P.U. or the G.P.M.B.'s Quality Control Department.

As previously stated, the Tropical Products Institute (TPI) visited the Gambia in June, 1975, to evaluate existing storage capacity. They recommended the immediate construction of two warehouses, one with 2500 ton capacity at Banjul and one with 3000 ton capacity at Kuntaur to be managed by the GPMB. Further, they recommended that a national storage policy be adopted with management responsibility for all food aid and imported rice storage being given to the GPMB. As shown by the inventory of existing storage, the storage of food aid is presently entrusted to many government agencies. The GPMB, responsible for the importing of rice, has difficulty in estimating current needs due to the varying

quantities of food aid entering the country. The TPI view was that, if the GPMB were responsible for all storage, it would be more cognizant of existing shipments of food from the exterior and could plan more efficiently its imported rice shipments, eliminating the storage costs of excess orders or avoiding temporary shortages. Also, a centralization of the storage function was said to have certain economies of scale with respect to administration, lowering total storage costs. The Gambian government has not yet made a decision on this proposal.

Secondly, the TPI experts felt that the Gambia did not need a rigid or excessive buffer stock program to prevent famine or to avoid destabilizing price behavior. It was felt that a minimum 4000 ton supply of cereals should be maintained in the event of interrupted deliveries. This stock would simply be stored with other cereals and constantly revolved. The TPI felt the Gambia could avoid the storage costs of a large reserve stock for the following reasons:

- (1) Excessive price fluctuations do not currently occur, as the Gambia imports a large proportion of its cereal requirements at reasonably stable prices.
- (2) Banjul can be reached with cereal shipments 4-5 weeks after order, with in-country distribution taking 3-5 days. Emergency aid from Europe could arrive more quickly.
- (3) With a diversity of food crops - rice, maize, millet, and sorghum - maturing at differing times throughout the year, the Gambia is relatively insulated from a total failure of domestic production.

For the above reasons, the TPI study concluded the Gambia could avoid the costs of an extensive food reserve program.

The only estimated storage costs for the Gambia are those for a national storage program. Incorporating the 5000 tons currently in good condition with the 5000 tons of newly constructed storage, estimated annual costs for the 10,000 tons of GPMB storage have been calculated as follows:

Table XXIX. Storage Costs (Dalasis)

	Level of Throughput		
	<u>25,000 tons</u>	<u>30,000 tons</u>	<u>34,000 tons</u>
Permanent Staff & Labor	37,059	37,059	37,059
Store Materials	5,400	5,400	5,400
Fumigation	18,831	22,453	25,350
Store Hygiene	9,097	9,097	9,097
Maintenance charge	12,640	12,640	12,640
Handling Charges (Port, Storehandling, transport)	285,067	342,080	387,691
Depreciation of buildings	33,266	33,266	33,266
Interest on Loans	17,089	17,089	17,089
Contingency Cost (10%) (of above expenses)	41,845	47,908	52,759
Office Charges	57,537	65,874	72,544
Quality Control Overhead	5,000	5,000	5,000
<b>Total Costs</b>	<u>522,831</u>	<u>597,866</u>	<u>657,895</u>
Cost per ton	20.91	19.93	19.35
Cost per Kilo:	.02	.019	.019

SOURCE: Report of the Tropical Products Institute mission to the Gambia, 1975.

With the current price of rice at 66B/kilo, annual storage costs, estimated at 2B, represent 3% of the purchase price.

The TPI also relates estimates of transport costs per ton provided by the Gambia River Transport Co.

Table XXX. Estimates of Transport Costs (Dalasis)

	<u>per ton</u>	<u>per kilo</u>
Banjul to Kemoto	5.00	.005
Banjul to Sankwia	6.25	.006
Banjul to Sambani	7.50	.008
Banjul to Kuntaur	8.75	.009
Banjul to Sapu/Georgetown	11.25	.012
Banjul to Basse	13.75	.014

SOURCE: Department of Agriculture

Thus, from Banjul to Basse, the furthest point up river, transport costs of 1.4 Butus and storage costs of 2 Butus only add 3.4 Butus per kilo to the purchase price of cereals.

The cereals storage system of the Gambia is oriented towards an economy depending on the exterior for its food supply. Stocks are concentrated in the Banjul area. With the increase of 5000 tons of capacity erected following the TPI's mission, total capacity seems adequate. Currently, the primary concerns of storage in the Gambia are the poor condition of government warehouses, the lack of storage in producing areas, and the decentralized control of this storage, which aggravates problems related to planning of purchases abroad.

## VI. CONCLUSIONS

This report has stressed the fact that the Gambia is, more than most Sahel states, integrated into the world economy, exporting groundnuts and importing rice. This specialization and trade has been intensified in recent years, spurred by relatively favorable producer prices for groundnuts. The easy availability of low cost imported rice appears to have further encouraged a reallocation of resources from domestic cereals production to groundnuts. Within foreseeable world price ranges for these products and under existing technological conditions, a departure from this specialization (reducing groundnut production to increase domestic cereals production) would reduce GNP.

There are, however, certain implications for the domestic economy and for government policy-making which are implied by the Gambia's relatively high degree of integration with the world economy. Any policy discussion towards food self-sufficiency must be viewed and studied from this aspect.

The relative price of groundnuts and rice is the key variable in producer decision-making. As long as the ratio of those prices implies greater profitability per work day and per acre for groundnuts than for cereals, the strategy of specialization and trade will be pursued. Governmental policy can, of course, be designed to change local groundnut and rice prices, resulting in departures from this world price ratio. But this will mean lower output and income. Thus, in its moves toward greater food self-sufficiency, the Gambia must balance the economic costs of this greater self-sufficiency against the gains in terms of security and a sense of reduced dependence.

There is another point not yet stressed in this study but widely noted in the Sahel. Programs aimed directly at intensifying cereals production may have great merit, but they do not necessarily mean that the composition of

output will shift in favor of food production. Higher cereal yields may only lead to a reallocation of farmer effort, with more to groundnuts and less to cereals, while he maintains constant cereals production. Swamp rice expansion holds the most promise, assuming the technical problems of salinity and access to fields are resolved.

Domestic prices are, of course, greatly influenced by the world prices of groundnuts and rice. The presence of imported rice at a reasonable price limits demand for millet and sorghum, effectively preventing the profitable commercialization of millet and sorghum. Seasonal price variations for millet and sorghum are greatly mitigated by the presence of the substitute product, rice. Geographic variations in cereals prices are slight due to the smallness of the country.

Other issues identified by this marketing study are related to the groundnut specialization. Some have argued that the lack of a guaranteed market for millet and sorghum, in contrast with the one for groundnuts and local rice with the GPMB, hinders the production and marketing of millet. Even though marketing risk for millet and sorghum must be borne by the producer, this study has stressed the relative producer prices of millet and groundnuts as the main obstacles to increased millet marketing. Given current prices, a change in the structure of marketing will not greatly increase millet marketing.

Finally, storage construction must also be harmonized with the country's overall strategy. There is, presently, much discussion of further increases in cereals storage capacity, notably to replace decrepit buildings and commercial leasing. Unless declines in rice imports are anticipated in the near future, this storage should be located near Banjul, the receiving point of rice imports. Thus, the storage location issue is also intertwined with the over-

all development strategy with respect to relative emphasis on rice or groundnuts.

The general point emerging from this study is clear. A policy of food self-sufficiency, while reducing the Gambia's dependence on uncertain world cereals markets, will have economic costs, in the short-run at least. Gambian policy-makers must view this trade-off realistically in defining the degree of self-sufficiency they seek.

INPUT USAGE

Input usage of fertilizers, insecticides, and animal traction is still very limited in the Gambia, where production methods are primarily traditional in nature. Yields, stagnant at comparatively low levels, reflect this lack of extensive input usage.

The 1974/75 Agriculture Sample Survey for the Gambia gives some indication of input usage. A survey of 1402 dabadas (farming units) revealed the following with respect to fertilizer, insecticide, and manure usage:

Table 1. Input Usage

	<u>#of Dabadas</u>	<u>For Groundnuts</u>	<u>For Rice</u>	<u>For Millet/Sorghum</u>
Fertilizer	1402	529	125	554
Insecticide	1402	161	36	0
Manure	1402	0	68	387

SOURCE: Gambian Agriculture Survey, 1975

The same survey revealed the following for dabadas using animal power:

Table 2. Animal Traction Usage

<u># of Dabadas</u>	<u># Using animal power for:</u>		
	<u>Groundnuts</u>	<u>Millet</u>	<u>Sorghum</u>
1402	904	308	177

SOURCE: Gambian Agriculture Surveys, 1975

The primary use of animal power is for plowing, but occasionally for planting.

The figures reveal that about 1/3 of the dabadas utilize fertilizer, which is subsidized by the GPMB, for groundnuts and for millet/sorghum. Insecticide usage is almost non-existent. Manure usage, primarily by farmers with access to herds, is confined to rice and millet/sorghum. Animal power is almost exclusively used for groundnut cultivation.

The following applications of fertilizer are recommended by the Agriculture Department:

Groundnuts	112 lbs. per acre of superphosphate
Sorghum/Millet Rice and Maize	50 lbs. N and 20lbs. P <sub>2</sub> O <sub>5</sub> per acre
Irrigated Rice	100 lbs. N and 40 lbs. P <sub>2</sub> O <sub>5</sub> per acre

The following estimates of fertilizer importations are available:

Table 3. Fertilizer Imports (tons)

<u>Year</u>	<u>Cereals (Compound)</u>	<u>Groundnuts (Superphosphate)</u>
1970/71	250	300
1971/72	500	850
1972/73	1690	2500
1973/74	3500	2456
1974/75	2000	2700
1975/76	350	4600

SOURCE: Department of Agriculture

The unevenness of cereals fertilizer importation reflects large stocks of unused cereals fertilizer. The steady increase in importations of groundnut fertilizer are consistent with the growing profitability of groundnut production.

Fertilizer is ordered and paid for by the GPMB, after consultation with the Department of Agriculture for estimated usage. The GPMB then makes the product available to Agriculture, who supervises its delivery to agriculture stations, cooperatives, and Mixed Farming Centers, which sell the fertilizer. The agricultural stations appear to handle the greatest volume of sales, perhaps due to convenience. Fertilizer can be purchased on credit from local traders. It appears that credit sales are of little importance since credit applications are approved after the recommended application period for the fertilizer, which is in June o July.

The sale price to farmers is below the real cost per bag of the fertilizer, with GPMB paying the differential from the fertilizer fund. The administrative costs of sale are borne by Agriculture, amounting to a further indirect governmental subsidy. The following subsidized and unsubsidized prices for fertilizer were available:

Table 4. Fertilizer Prices  
(Dalasis)

	<u>72/73</u>	<u>73/74</u>	<u>74/75</u>		<u>75/76</u>	
	<u>C</u>	<u>G</u>	<u>C</u>	<u>G</u>	<u>C</u>	<u>G</u>
Subsidized Price	5.50	4.50	5.50	4.50	6.70	5.30
Unsubsidized Price	20.80	13.35	20.80	13.00	20.46	13.93
% Subsidy	74%	66%	74%	66%	67%	62%
Total Cost of Subsidy	100,348	238,462	100,000		NA	

C - Cereals bag of 50 lbs.  
G - Groundnut bag of 112 lbs.

SOURCE: Department of Agriculture

The percentage subsidy has been higher for cereals fertilizer than for groundnut fertilizer. Nevertheless, as previously shown, the tonnage used on groundnuts is greatly superior to that used on cereals, due to the greater profitability per acre of groundnut production.

The primary problems with fertilizer usage in the Gambia appear to be:

- (1) Their sale should be encouraged at the MFCs and seed stores to enlarge the geographic scope of fertilizer used. Concentrating sales at the agricultural stations hinders usage by farmers not in close proximity to the centers.
- (2) Fertilizer should be put in place for sale earlier so farmers with cash in January or February from groundnut sales might be induced to purchase fertilizer, also avoiding any problem with late delivery.
- (3) Credit by the cooperative should be extended earlier, allowing farmers to buy fertilizer on credit before the recommended month for its application

Seeds - The GPMB encourages the storing of groundnut seeds by the farmer himself in village seed stores. Seeds are, however, sold by the GPMB and its licensed traders during planting time. The Agricultural Research Unit provides free experimental or improved seeds on a limited basis to selected farmers. There appears to be, outside the pilot programs discussed, no direct supplying of millet or sorghum seeds to the farmer. The Sapu rice project, however, does give free seed in conjunction with its program.

Other Inputs - Oxen, plows, and the limited quantity of insecticide used are sold through Agriculture at unsubsidized prices. Treatment for

groundnut seeds at village seed stores is done free of charge to the farmer, the cost of insecticide paid by the GPMB.

Program for input extension - As previously discussed, pilot projects for maize, groundnuts, rice, millet, and sorghum exist. The primary purpose of these programs is to encourage more modern production techniques and input usage. Recommended inputs (animal traction, insecticides and fertilizer), as well as instruction in their proper usage, are provided to selected farmers. The following year, the farmer is encouraged to purchase the inputs, assuming he has recognized the profitability of their usage. It is also hoped that neighboring farmers, seeing the beneficial results of such input usage, will duplicate these modern methods. This program, due to its limited scope and necessity for volunteer duplication, will have little short-run impact on increased input usage. It remains to be seen, however, if a long-run increase in input consumption can be generated.

A more direct, large scale project to encourage input usage and a modernization of farming techniques is currently being launched in the Gambia. This project, called the Rural Development Project, is a \$13 million, four-year project receiving equal financing from the World Bank, the United Kingdom, and a Middle East bank. The project will include the totality of the area west of the MacCarthy Island Division. This is a village-level development project which will attempt to introduce an Intermediate Technology Package of inputs. It is hoped that, within each of 65 villages, the project will reach a participation ratio of 60-65%, or about 22 compounds. If successful, the project would include about 1500 compounds, or 30,000 people.

The Intermediate Technology Package includes ox, oxen equipment, ox cart, seeder, fertilizer, and tool kit. Also, the project has features that address reforestation, public health, and other community development issues. Within each village will be located a trained staff to instruct in the proper usage of the new inputs. It is envisioned that this staff will be Gambian. Currently, the project director is searching for Gambians to begin the training phase. The farming units included will be those involved in compound farming; groundnuts, sorghum, millet and traditional rice. The project aims at increasing yields and production of all major crops.

The project, while independent of the Department of Agriculture, has direct lines of communication with Agriculture. Certain administrative and field reforms within Agriculture have already arisen from the project's preparation.

The current plan of work is to begin immediately (Winter 1977) with construction of training centers and other buildings in the selected villages. Also, a Gambian training staff will be selected and prepared. The field work and input distribution is scheduled for June of 1978. Thus, the 1978/79 campaign will be the first to show a direct effect of the rural development program.

The distribution of the inputs will be on credit to the farmer, the package costing 2000 Dalasis. This is the full cost price of the inputs with the exception of the fertilizer, which will benefit from the GPMB subsidy. The farmer will pay 11% interest on his loan. The estimated internal rate of return for the farmer using this package is 16%. This is based on increased yields per acre, as well as a 20% increase in cultivable surface, made possible by the use of these labor savings inputs.

The program, in principle, addresses the necessity for the Gambia to modernize its agricultural sector. It is sufficiently large scale in effort to have a measurable impact on total production. However, the program must address some serious problems:

- (1) The package is an expensive proposition, 2000D, with a market rate of interest, 11%. Only relatively affluent farmers are in a position to accept this indebtedness.
- (2) It is possible that with increased productivity the farmer will further reduce land devoted to cereals to extend groundnut production. The result would be an unchanging production of cereals and a substantial increase in groundnuts. The program will be continually monitored to signal any development of this nature.
- (3) The level of this technology may be too complicated for the average Gambian farmer. Very patient and detailed instruction will be necessary to avoid misuse of this technology. While there are provisions for sufficient advisory personnel in each village, their recruitment in adequate numbers from the Gambian work force will be difficult.

In general, the Rural Development Program has great potential. However, it could suffer from an over-ambitious scale of operations. Smaller, intensive pilot projects might be better recommended to appraise the overall merit of the program and to confirm the estimated benefits for the farmer. Nevertheless, this is really the only major program in the Gambia to encourage greater input usage.

Appendix 2 - Appendice 2

- A. People consulted during visit to the Gambia  
Nov. 17 - Dec. 3, 1976; Jan. 31 - Feb. 1, 1977

Personnes consultées lors de la visite en Gambie  
17 Nov. - 3 Déc. 1976, 31 Jan. - 1 Fév., 1977

Ministry of Agriculture - Ministère de l'Agriculture

Thomas Reubn - Director of Agriculture  
Wally N'Dow - Director of Veterinary - CILSS Representative  
Philip Beusanda - Agriculture Ministry Office  
Mr. Jagne - Agriculture Ministry Office  
Cyril Eyre - Agriculture Advisor  
Mr. B. Suso - MFC at Sarengi  
Mr. B. Jagne - Agricultural Assistant, Jenoi  
W.H. Davies - Animal Husbandry Officer, Sapu  
M.B. Benga - Crop Protection Unit  
M.M. Dibba - Department of Cooperatives  
Bob Taylor - Crop Protection Unit

Ministry of Plan - Ministère du Plan

A.B. N'jie - Agricultural Economist

Central Statistics - Statistiques Centrales

Mr. Singal - Director

Price Control - Contrôle des Prix

Mr. Jobe - Principal Price Control Inspector

Ministry of Local Government - Ministère du Gouvernement Local

Mr. Jagne

Gambia Produce Marketing Board

Mr. Brennan - Chief Accountant  
Mr. Drapier - Advisor  
Mr. N'Dimbalan - Operations Manager  
H.D. Corp - Agent, Sapu

Other - Autres

Michael Wygant - U.S. Chargé d'Affaires  
Douglas Broome - U.S. AID  
Michael Wagner - W.F.P. Representative  
Jim Colbran - UNDP  
Helmare Trupke - FAO  
Colin Clark - Catholic Relief  
John Muenzen - Peace Corps Volunteer  
George Lowe - Director of Rural Development Project  
Mr. Cole - National Trading Corporation  
Pierre Couerbe - CFAO executive  
Sam Wedderbrun - Center of West African Studies

Visited - Endroits Visités

Albert Market - Banjul, MFC-Sarengi, GPMB outlet- SAPU,  
Agricultural Station - Sapu, Jenoi, Yundum Research Center  
and Library

Appendix 2 - Appendice 2

B. Documentation

1. Central Bank of the Gambia, Annual Report, various years.
2. The Gambia Produce Marketing Board, Annual Report, various years.
3. International Bank for Reconstruction and Development, 1975.
4. The Gambia, Agricultural Program, 1976/77.
5. J.D. Winter and G.A. Gilmen, Report of the Grain Storage/Marketing Evaluation Mission to the Gambia, Tropical Products Institute, 1975.
6. The Gambia, Agricultural Development Project Paper.
7. Trupke, Increasing Food Availability through Waste Reduction and Improvements of the Marketing System in the Gambia, FAO, 1976.

APPENDIX 3

Grain Prices in Major Markets

Monthly Prices  
(Dalasis per 500 gr.)

Year	Grain	J	F	M	A	M	J	J	A	S	O	N	D
1974	<u>BANJUL</u>												
	Rice Imported							0.23	.24	.23	.23	.24	.26
	Rice Indigenous							0.24	—	—	.23	.23	—
	Millet							0.15	.15	.15	.14	.14	.14
	Sorghum							0.14	.14	.13	.15	.16	.13
1975	Rice Imported		.29	.32	.30	.30	.31	.30	.30	.30	.30	.30	.30
	Rice Indigenous	.34	—	.30	.30	.30	.28	.32	.32	.32	.30	.31	.30
	Millet	.17	.14	.14	.14	.15	.13	.15	.15	.18	.18	.18	—
	Sorghum	.16	.13	.15	.14	.14	.14	.15	.16	.17	.17	.18	.24
1976	Rice Imported	.30	.30	.30	.30	.30	.30	.30	.33	.33	.33		
	Rice Indigenous	—	.30	—	.32	.32	.32	—	—	.35	—		
	Millet	.25	.27	.27	.27	.27	.28	.29	.29	.29	.29		
	Sorghum	.19	.26	.26	.26	.26	.28	.29	.29	.29	—		
1974	<u>BRINKAMA</u>												
	Rice Imported							.28	.28	.25	.27	.25	.32
	Rice Indigenous							—	—	—	—	—	—
	Millet							—	.14	.18	—	.12	.14
	Sorghum							—	—	—	—	—	—
1975	Rice Imported	.28	.31	.13	.28	.30	.29	.31	.30	.31	.32	.31	—
	Rice Indigenous	—	—	—	—	—	—	—	—	—	—	—	.31
	Millet	.13	.11	.14	.11	.15	.13	.14	.13	.14	.14	.19	—
	Sorghum	.10	—	—	—	—	—	—	—	—	—	—	—
1976	Rice Import	.31	—	—	.29	.29	—	.30	—	.31	.34		
	Rice Indigenous	—	—	—	—	—	—	—	—	—	—		
	Millet	—	.29	.26	.28	.28	.27	.33	.29	.28	.28		
	Sorghum	—	—	—	—	—	—	—	—	—	—		

2.34D = \$1.00  
 160B = \$100  
 16B = \$10  
 1.6D = \$1  
 1D = 100 Butus







APPENDIX 4

Profitability Calculations for Major Crops

Table 1. Millets: Suno and Sanyo  
Estimated Returns and Costs per acre

ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
Revenue					
Millet	Grain	Pounds	600	.13D	D78.00
<b>COSTS:</b>					
<b>A. Variable</b>					
Seed	Local Var.	lbs.	5	D0.25/lb	1.25
Seed Treatment	NOT USED	PRESENTLY			
Fertilizer	OPEN CATTLE MANURING	-	-	D2.00/ac.	D2.00
<b>LABOUR:</b>					
Land preparation	By hand	Man hrs.	2	D2.00/day	D4.00
Planting	" "	" "	3	D2.00/day	D6.00
Weeding	Twice by hand	" "	16	D2.00/day	32.00
Harvesting	By hand	" "	6	D2.00/day	12.00
Transplanting	By Ox-Cart	Cart loads	2	D3.00/day	6.00
Threshing and Bagging	By hand	bag	2.5	D5.00/day	12.50
Total Variable Costs:					D75.75
<b>B. Fixed</b>					
Hand tools	Depreciation and Repairs				3.00
Total Fixed Costs:					3.00
Total Variable & Fixed Costs:					D78.75
Total Profit:					-.75D

Table 2. Upland Rice  
Estimated Returns and Costs per acre

ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
Revenue					
Rice	Paddy	Pounds	800 lbs.	.200	1600
<b>COSTS:</b>					
<b>A. Variable:</b>					
Seed	Paddy	lbs.	60	D0.18	D 10.80
Fertilizer	-	-	-	-	-
Seed Dressing	-	-	-	-	-
<b>LABOUR</b>					
Land preparation	By hand	Man days	3	D2.00	D 6.00
Planting	Broadcast	" "	1/2	2.00	1.00
Weeding (once)	By hand	" "	12	2.00	24.00
Bird Scaring	By children	Child "	15	1.00	15.00
Harvesting	By Hand	Man days	15	2.00	30.00
Transporting	Oxen	Cart Load	4	3.00	12.00
Total Variable Costs					D98.80
<b>B. Fixed</b>					
Land Tools	Depreciation and Repairs				D1.60
Total Fixed Costs:					D1.60
Total Variable and Fixed Costs:					D100.40

Net return to land, Capital and Management is D59.60.

Table 3. Swamp Rice - Rainfed  
Estimated Returns and Costs per acre

ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
Revenue					
Rice:	Paddy	Pounds	1,200	D0.20	D240.00
<b>COSTS</b>					
<b>A. Variable</b>					
Seed	Paddy	lbs.	50	D0.16	D 8.00
Manure	-	-	-	-	-
Seed Dressing	-	-	-	-	-
<b>LABOUR</b>					
Land Preparation	By hand	Man days	15	D2.00	D 30.00
Planting	Broadcasting	" "	3	2.00	6.00
Weeding (once)	By hand	" "	10	2.00	20.00
Bird Scaring	By children	Child "	15	1.00	15.00
Harvesting	By hand using sickle	Man "	4	2.50	10.00
Threshing and bagging	By hand using sticks	Man days	4	2.50	10.00
Transporting	By Oxen	Cart Load	2	3.00	<u>6.00</u>
				<b>Total Variable Costs:</b>	<b>D105.00</b>
<b>B. Fixed Costs:</b>					
Hand Tools	Depreciation and Repairs				<u>1.60</u>
				<b>Total Fixed Costs:</b>	<b>1.60</b>
				<b>Total Variable and Fixed Costs:</b>	<b>D106.60</b>
Net return to Land, Capital and Management is D133.40.					

Table 4. Maize  
Estimated Returns and Cost per acre

ITEM	DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
Revenue		(200 lb)	(1000 lbs)		
Maize	Grain	bag	5 bags	D25.00	D125.00
<b>COSTS</b>					
<b>A. Variable:</b>					
Seed	Local Var. e.g. "JEKA"	lbs	25	0.12	3.00
Manure	Dungs & Household refuse	-	-	2.00 (assumed)	2.00
<b>A. LABOUR</b>					
Land Preparation (ploughing)	By hand	Man days	6	D2.00	D12.00
Planting	" "	" "	3	2.00	6.00
Weeding 1st & 2nd	" "	" "	12	2.00	24.00
Harvesting	" "	" "	3	2.00	6.00
Transporting	By Oxen	By Load	2	3.00	6.00
Threshing and bagging	By hand	bags	5 bags (D1.00 per empty bag)	2.00	12.50
Total Variable Costs:					D71.50
<b>B. Fixed:</b>					
Hand Tools	Depreciation and Repairs (D1.00/yr.)				3.00
Total Fixed Costs:					3.00
Total Variable and Fixed Costs:					D74.50
Net return to land, capital and management is D50.50.					