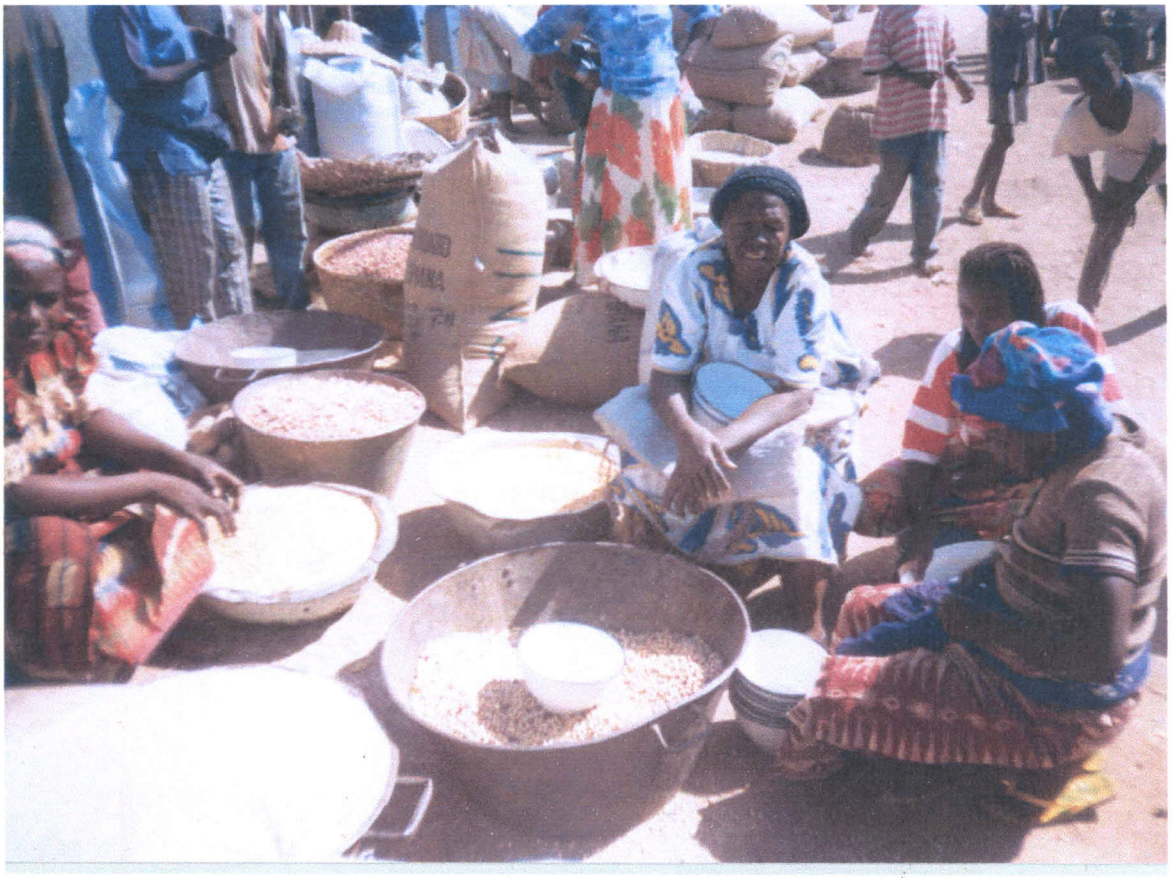
BAMBARA MARKETING MARGINS ANALYSIS



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February, 2004

ABSTRACT

Bambara Marketing Margins study was conducted in selected production and consumption centers in the Northern, Upper East and Brong Ahafo regions using a commodity subsystems approach. The study identifies the distribution channels for bambara by tracing the movement of raw bambara grain from the producing centers to the consuming centers, examines the socioeconomic background of the various actors in the marketing system and gathers data on prices at the various bambara distribution channel for marketing margins analysis. Results indicate that bambara is a low volume traded product at both wholesale and retail levels as compared to other legumes and has limited distribution outlets. Approximately 35% of volumes of bambara produced is utilized by the producer-households either as food and/or seed and about 92% of the bambara producers sell their produce at their homes or local markets. Sales are usually effected five months after harvesting (May-June), when food is scarce and demand is high. However, high demand in the South coincides with the plantain season, which occurs in January-February. A few (13%) bambara producers sell their produce to processors directly on the local markets and about 51% of producers interviewed depend solely on the activities of visiting itinerant traders. Producers who sell directly to local itenerant traders only constitute about 12% of the sample interviewed while 6% sell to retailers. The bambara marketing structure could be classified as an oligopsonistic one, having few buyers and consumers have little knowledge of bambara-based products. Pricing is based largely on negotiation/bargaining power, than with the true value of the product and the position of the producer in price formation is weak. The Total Gross Marketing Margin for bambara is estimated at 41.66% with Producer Participation Margin of 58.34%. Total Marketing Charges is approximately 11%. Recommendations made include development of consumer educational programs focusing on the contribution of bambara to health and nutritional requirements as well as its unique flavour, establishment of a viable bambara market information system, market expansion effort to be focused on both bambara consumers and non bambara consumers using value based marketing strategy as well as a further investigation into post storage volume traded at various stages of the distribution chain.

INTRODUCTION

Comparatively, very little research has been done on bambara groundnut (Vigna subterranea L. Verdc) in Ghana in the past and the crop is thus considered as a forgotten crop though its nutritional and food security importance cannot be overemphasized. It is a well-balanced food in terms of protein, carbohydrate and lipid content with low levels of anti-nutritional factors and has high processing potential, which needs to be explored. A recent research on bambara by Azam-Ali and Squire (2001) and Azam-Ali *et al.* (2002) with special interest in utilization and marketing prospects is a typical example of how the potential of any underutilized crop can be assessed and utilized through multidisciplinary research effort. Since 1988, scientists in four European countries, United Kingdom, the Netherlands, Germany and Italy, have joined forces with scientists, growers, traders and consumers in Botswana, Tanzania, Sierra Leone, Swaziland, Namibia and Zimbabwe to work on this indigenous African legume. Together, their efforts provide a comprehensive assessment of the ecophysiology, agronomy, nutritional biochemistry, agroprocessing, genetics, and marketing potential of bambara groundnut in the region.

Currently, a high quality bambara flour (HQBF) technology transfer research programme funded by the Crop Post Harvest Programme (CPHP) of the UK Department for International Development (DFID) is being implemented in Ghana using a multi-institutional approach led by Food Research Institute (FRI) of Council for Scientific and Industrial Research (CSIR). This programme is an extension of a previous demand-driven preliminary research that sought to address the issue of long cooking processes limiting the utilization of bambara in Ghana. The current project aims at establishment of a value added-chain through HQBF based recipe development, training of small-scale processors, and involvement of commercial processors as well as sale of well-packaged HQBF through identified market outlets.

Bambara Marketing Margins Research (BMMR) is one of the activities under the HQBF technology transfer programme. The BMMR study identifies the distribution channels for bambara by tracing the movement of raw bambara grain from the producing centers to

the consuming centers. The general socioeconomic background of the various actors in the marketing system is examined to gain detailed understanding of the roles of the participants, and finally data on prices at the various bambara distribution channel are collected, analyzed and gross marketing margins established.

Components of marketing costs and margins are of interest to decision makers and stakeholders because such knowledge can serve as the basis for reducing inefficiencies in the marketing system through innovative interventions at the appropriate levels of the distribution chain. Marketing has an intrinsic productive value because it adds time, form, place and possession utilities to products and commodities. Through the technical functions of storage, processing and transportation as well as exchange, marketing increases consumer satisfaction (Smith *et al*, 1999). As incomes and populations grow and agricultural specialization increases and non-agricultural sector develops, there is an increased demand for marketing services. The role of markets in encouraging increased production through price incentives is therefore crucial.

METHODOLOGY

A commodity subsystems approach, which combines marketing functions approach and the organizational approach is the main methodological framework used in this study. Institutional analysis is based on the identification of the major distribution channels, determination of the channel participants, including procedures needed to determine sample size while the marketing functions approach concentrates more on the relative contributions of the channel participants as it relates to marketing as an economic activity.

Sampling

Using background information obtained from a baseline study conducted earlier under the technology transfer programme in the project area and previous research findings on production and marketing of bambara, two main seasons which adequately reflect the relevant bambara market cycles were identified. These include the period before storage

characterizing the main harvesting season and after storage when a lot of farmers are willing to sell off their produce; supply and demand conditions normalized and marketing activities are seen to be relatively competitive. The current survey was conducted in the pre storage or harvesting season in the month of November 2003. Considering space (spread of players involved in bambara marketing), time and availability of resources a total of 100 traders and producers were selected purposively for structured interview to capture the price changes along the distribution chain; from production points to the consumption centres. The post storage survey would be conducted in May/June 2004 with much emphasis on proportions of bambara grain traded at various stages of the distribution chain.

Survey Areas

The survey was conducted in selected production and marketing centers. In the production centres, producers were interviewed at Zinindo and Zamashiegu in Gushiegu\Karaga district, Nyamkpala in Tolon Kumbugu district and Savelugu and Tampiong in Savelugu-Nanton district all in the Northern Region of Ghana.

Map of Ghana with regions where survey was conducted marked red.

In the marketing centres, traders were interviewed in Bolga in Upper East region, Tamale, Nyampkala and Savelugu in the Northern region and Techiman in Brong Ahafo region.

Questionnaire Design and Data Collection

Primary data was collected using a structured questionnaire. An informal insitu interviews noting responses and observing the marketing process was conducted simultaneously with the formal survey. This allowed for generation of qualitative information which could not be captured in the structured questionnaire. The structured questionnaire modules consisted coded questions covering information on producers and traders socio-economic profile, production levels, quantities sold, description of sale, marketing services and costs , selling prices and seasonal variations in supply and demand. Others are destination of major customers of producers and traders, major sources of supply, factors affecting volumes traded and mode of price determination.

In addition to coded questions, there where open-ended questions to allow respondents discuss freely the particular marketing issues of concern to them.

Analysis of Data and Estimation Procedure

Responses were coded and the Statistical Package for Social Science (SPSS) and Microsoft Excel used to process the data for descriptive analysis. The marketing margin analysis is based on gross figures since return on capital and imputed salaries earned by the middlemen in the distribution of many agricultural commodity chains is often difficult to determine.

The estimation procedure for marketing margins analysis is presented below;

$$TGMM = \frac{\text{Retailing Price} - \text{Farm gate Price}}{\text{Retailing/Consumer Price}}$$

$$TGMM_{RA} = \frac{\text{Rural Assembler Price- Farm gate Price}}{\text{Retailing /Consumer Price}} * 100$$

$$GMM_W = \frac{\text{Wholesale Price - Rural Assembler Price}}{\text{Retailing /Consumer Price}} * 100$$

$$GMM_r = \frac{\text{Retailing Price – Wholesale Price}}{\text{Retailing /Consumer Price}} * 100$$

$GMM_p = 100\% - TGMM$

NNM= TGMM-TMC

Where TGMM denotes Total Gross Marketing Margin

$TGMM_{RA}$. The percentage of the total gross marketing margin received by the rural assembler

GMM_W . The percentage of the total gross marketing margin received by the wholesaler

GMM_r - The percentage of the total gross marketing margin received by the retailer

GMM_p - The producer participation margin

TMC - The total marketing charges expressed as a percentage of retail price

NMM - The Net Marketing Margin

RESULTS AND DISCUSSIONS

A. SOCIO-ECONOMIC PROFILE OF RESPONDENTS AND GENDER ISSUES

It is important to characterize the socio-economic profile of the key actors identified in bambara marketing system as a first step towards gaining understanding of their behaviour and contributory roles in market development. Basically the social aspect of marketing of Agricultural commodities is quite strong and bambara marketing is no exception. Because of long term involvement in trading activities, farmers have a strong trust-built relationship with itinerary traders and to some extent with the market-based traders. Unfortunately, in the case of bambara, the relationship between producers and traders did not reflect in informal understanding with respect to provision of credit, market assurance, process of buying and assistance in case of other social needs as seen in the marketing of other Agricultural commodities. As shared among many Agricultural marketing researchers, such relationships develop when volumes traded are high (See Heide and John 1990; Han et al, 1993; Morgan and Hunt, 1994). Descriptive statistics on bambara producers with respect to production levels, yields and volumes traded attest to the above assertion (See table1).

Producers

Table1 presents an informative summary of socio-economic profile of bambara producers interviewed. Primarily, bambara cultivation is dominated by men but generally marketed by women. Men formed about 93% of respondents interviewed. They are married and mostly Moslems by religion with no formal educational background. The study revealed that the main occupation of the bambara producers is farming. Other cereals and legumes cultivated include maize, sorghum, millet, cowpea, groundnut etc,etc. Bambara was a minor crop in terms of acreage of cultivation but a very important food security crop to farmer households.

Table1. Socio-Economic Background of Producers Interviewed

Characteristics	% Response			
Sex	Male	Female		
	92.7	7.3		
Education	No Education	Primary/JSS/Middle	Secondary	Others
	81.4	11.6	4.7	2.3
Religion	Christian	Moslem	Traditionalist	Others
	14.0	86.0	-	-
Marital Status	Married	Single	Separated/ widowed	
	95.3	2.3	2.3	
Main Occupation	Trading	Farming	Fixed Salary	Others
	4.7	93.0	2.3	-
Secondary Occupation	Trading	Others	NA	
	4.7	20.9	74.4	
	Descriptive Statistics			
	Min	Max	Mean	Std Dev.
Age (Years)	20	65	37.88	12.30
Family Size	2	33	8.33	5.31
Area Cultivated (Acres)	0.25	4	1.12	0.68
Quantity Harvested (Bags)	1	15	5.00	3.50
Quantity Utilized & Seed (Bags)	0.1	5	1.63	1.27
Quantity Sold(Bags)	0.5	14	3.27	3.15
Time of Sale after harvesting (M)	1	8	5.50	1.20

Source: Author's Compilation

The level of commercialization in the bambara industry is limited. Some of the producers interviewed but excluded from this analysis (because the study focuses on participation of producers in the marketing chain) reserve all the bambara produced for home consumption. Few of the producers interviewed also engaged in off-farm income generating activities like trading, processing and artisanal jobs.

Traders

The study indicates that approximately 88% of the bambara traders interviewed are women. As evidenced in FAO, 1993 report; women's participation tends to be highest

where production, marketing and trading have been least affected by commercialization and industrialization. Cross tabulation of respondents by sex against type of traders revealed a significant level of women's participation in retailing while the men are more interested in wholesaling activities. Pearson Correlation results also showed a significant relationship between sex and volumes traded/type of trader.

Table2. Socio-Economic Background of Traders Interviewed

Characteristics	% Response			
Sex	Male	Female		
	12.5	87.5		
Education	No Education	Primary/JSS /Middle	Secondary	Tertiary
	97.5	2.5	-	-
Religion	Christian	Moslem	Traditionalist	Others
	7.5	92.5	-	-
Marital Status	Married	Single	Divorced	Separated/Widowed
	80.0	2.5	2.5	15.0
Main Occupation	Trading	Farming	Fixed Salary	Others
	97.5	2.5	-	-
Secondary Occupation	Farming	Others	NA	
	5	2.5	92.5	
Type of Trader	Wholesaler	Retailer	Wholesaler/ Retailer	
	20.5	33.3	46.2	
	Descriptive Statistics			
	Min	Max	Mean	Std Dev.
Age	22	63	41.75	10.26
Experience in Bambara Marketing	3	40	18.65	12.04
Family Size	3	20	7.27	3.48

Source: Author's Compilation

High level of women's involvement in the informal service sector could partly be explained by their poor educational background which does not warrant the opportunity to access formal jobs. Only 2.5% of the respondents interviewed had had formal education up to the middle school level. Like the producers, majority (92%) are Moslems and married (80%) with average family size of 7. These traders who also engage in marketing other legumes and cereals have appreciable experience in bambara marketing;

ranging from a minimum of 3 years to a maximum of 40 years, either as all year round traders or as seasonal participants (See table 2).

Table3. Description of Markets visited

Market	Location	Description
Nyamkpala	Northern region/ Tolon Kumbugu district	Semi-Rural market organized on a 3-day cycle.
Bolga	Upper East region/ Bolga district	Urban periodic market organized on a 3-day cycle. A new structured market
Tamale	Northern region/ Tamale district	Urban wholesale periodic market organized on a 6-day cycle. A relatively developed market with marketing facilities.
Techiman	Brong Ahafo region/ Techiman district	Urban wholesale market organized from Wednesday-Friday weekly. A relatively developed market with marketing facilities
Savelugu	Northern region/ Savelugu Nanton district	Semi-Rural market organized on a 3-day cycle.

Source: Author's Compilation[1]

B. ACTORS INVOLVED IN BAMBARA GRAIN MARKETING

Marketing of bambara grain like many other grains in Ghana is organized by several individual private traders, who take the responsibility of transporting raw grain from the production centers to the consumption centers. Co-ordination of their activities is rather informal; each actor usually making the necessary arrangements for an efficient execution of his or her business to derive maximum satisfaction and fulfill a societal need. Categories of actors identified in the various segments along the distribution chain for bambara include the following;

Production Segment

- Producers – These are small scale farmers who usually grow bambara in a mixed rather than sole cropping farming system purposely for home consumption and the surplus for sale. Approximately 35% of volumes of bambara produced is utilized by the producer-households either as food and/or seed. Very few producers engage in bambara cultivation for sale only. Sales are usually effected

[1] The markets are not exclusive bambara markets, but bambara forms only a small part

5months after harvesting (May-June), when food is scarce and demand is at its peak.

Unshelled bambara packaged in sacks for storage at the producer level

As indicated in the respondents' profile, average area cultivated per farmer is about 1acre and some may cultivate as low as a quarter of an acre. This makes bulking of bamabara grain more labour intensive and the role of middlemen very crucial. Observations made during participatory interviews also revealed that most producers do not visit the major markets. Though there are limited barriers of entry into these markets, farmers prefer selling either in their homes or on the local markets to safe time for other jobs and to avoid any inconveniences as well as risks in the marketing process which traders are better placed to take.

Rural Assembly Segment

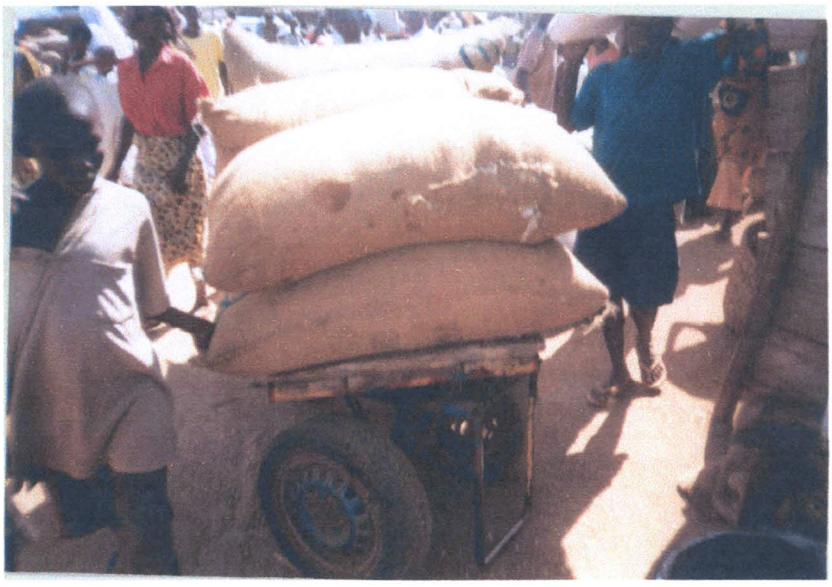
- Local Agents- These do not take title to the goods and therefore do not bear any marketing risks, but buy on behalf of visiting itinerant traders who do not have adequate knowledge about the local supply conditions for a fee. The local agent has a very important role to play with primary responsibility of concentrating relatively large volumes of grains at the village level. He/she sometimes has to

move from one village to the other in search of grains to buy using the visiting traders' capital.

- Visiting itinerant traders- This group provides the most permanently available outlet for marketable surplus at the rural level. As indicated earlier, they employ the services of buying agents for a fee. Some credible agents are also given cash advances to facilitate purchasing.

- Local itinerant traders – These are residents who buy predominantly at the farmer's house or local markets with their own capital. They have adequate knowledge of the local supply situation and most times have relatives or trusted customers at the major marketing center.

- Truck pushers- These are used to transport grains from the farm gate to the assembling point for on-ward transportation by big trucks to urban markets. Other means of transportation employed at the assembling level include head load, donkey carts and bicycles.



Truck pushers loading grains at Savelugu market

Wholesale Segment

- Agents- The market level commission agents sell/buy on behalf of visiting traders. They sometimes make extra money when bambara is bought or sold above the price agreed upon with owners. At Techiman market, the agents own stores and therefore take custody of grains form assemblers and sell. They may also run a small trade of their own and may use their experience gained as agents to set up as independent wholesalers. Majority of the commission agents are men.

- Transporters - Transport is an important marketing facility linking production centres to consumption centres. It was observed that traders make prior transportation arrangements with transporters for commodity movements between markets. The relationship between traders and transporters could be described as healthy. Traders do not always accompany their good. In that case, packaging materials are marked for identification purposes. Sometimes transportation costs are borne by truck owners and payment made after sales. The drivers' mates do loading and unloading for a fee. The common type of transportation used in transporting bambara and other grains and cereals is the mummy truck.

- Handlers – These are commonly seen in the wholesale segment and to a lesser extent at the retail level. They are usually in charge of packaging or bagging. After filling grains in jute sacks, the open end is sealed by sewing with tread and needle. Bagging charges range between c1000 and c5000 per bag depending on the market.

Packaging of grains at Savalegu Market in the Northern Region

- Wholesalers - These sell in bulk to other visiting wholesalers or to retailers. They do not rush in selling because they hold large stocks using their own storage facilities to ensure availability throughout the year and most importantly to get attractive prices. Sometimes grains are treated and stored for a maximum of 1 year. Some of the wholesalers are men especially at the urban markets. At the Tamale and Techiman markets for instance, majority (70%) of the grain wholesalers are men.

Debulking/Retail Segment

- Retailers - These are permanent traders whose activities are restricted to local markets. They sell in small quantities to consumers in bowls (a bowl of bambara is about 2kg). They may sell up to 5bags per week depending on the location, season and demand conditions. They usually visit the market with just enough quantity to sell for a day and on few occasions hire a store for keeping unsold grains at the end of each marketing activity. On the urban markets retailers could sell on 'sale or return' basis and might not need to arrange for storage facility.

Wholesaler/Retailer measuring bambara with a koko bowl at Bolga wholesale market

Consumption Segment

- Processors/Food Vendors- Bambara processing is exclusively a female activity, done individually but on specialized lines as detailed in the baseline report conducted earlier. Bambara is commonly processed into koose, tubani and gablee. It could also be sold roasted, freshly or dried boiled. A processor may engage the services of hired female labour or assisted by female family members. Processing levels are low, ranging between 1-10bowls of Bambara per day. Usually more is processed on market days, which occur every 6days (6-day cycle).

- Final Consumers - Consumption of bambara based products is popular among people of Northern decent. It has a cultural significance and highly consume during hanger periods. Though people in the southern Ghana usually consume bambara sauce with fried plantain, there seems to be a general lack of knowledge on the nutritive value of bambara in the south.

Other players

- District Assemblies- All the markets visited are managed by the market management committees of the District Assemblies who are responsible for infrastructural development. Market tolls/fees are charged for the use of covered and open space or on the value of the produce sold.

- PPMED (MOFA) - Government of Ghana is committed to the provision of comprehensive and timely market information services through the activities of PPMED (MOFA). MOFA is responsible for market information on wholesale and retail prices, and commodity movements; co-ordinating the collection, compilation and dissemination of adequate, complete and reliable market information. Unfortunately this information service facility covers only major crops and legumes like cowpea, groundnut, and soyabean but not bambara.

- Creditor/Money lenders - Creditor or Money lenders generally help market participants with financing. However it must be noted that all the respondents interviewed claimed to have financed their trading activities through own resources or with the help of retailers with the exception of retailers who some times sell bambara on 'sale or return' basis and a few wholesalers at the major market centres selling on behalf of farmer-relatives.

- Store/Stall Owners – These provide space for storage to both visiting traders and permanent traders especially retailers who do not have storage facilities.

Store/Stall owners may charge permanent traders flat monthly rate but visiting traders are charged daily or weekly.

C. DISTRIBUTION CHANNELS

Distribution channels present a systematic knowledge of the flow of goods and services from the production center to the consumption center which forms major components of the marketing margins analysis. A typical food commodity marketing system in Ghana can be characterized by a flow chart representing product movements from producers to consumers passing through subsequent stages of various distribution channels. At each level of the distribution channel, spatially separated market, defined in this study as a physical area where transactions are concluded, may be linked with each other through arbitrage (Lutz and Tilburg, 1997). Unlike commodities with high level of utilization and commercialization and therefore several distribution outlets, bambara has relatively limited use with less distribution outlets. It is mostly produced in Northern Ghana and some parts of Brong Ahafo and Volta regions but its level of consumption is variable, highly location specific and largely influenced by tribe. Except for places where people of the Northern decent are dominated, consumption of bambara is significantly tied to the plantain harvesting season since people in the south especially consume fried plantain with bambara sauce.

The study revealed that generally farmers produce bambara purposely for subsistence and to a limited extent for sale. Although bambara farmers were engaged in the production of cash crops, they did not abandon the production of household food requirements partly because the farmers did not have confidence that the market would supply food products when needed at affordable prices. The study also revealed that while transporting bambara to the major market centers were decisively more profitable than selling in the farming communities, farmers preferred selling through the latter channel. This could be explained by lack of time on the part of the farmers and/or limited accessibility to the major markets.

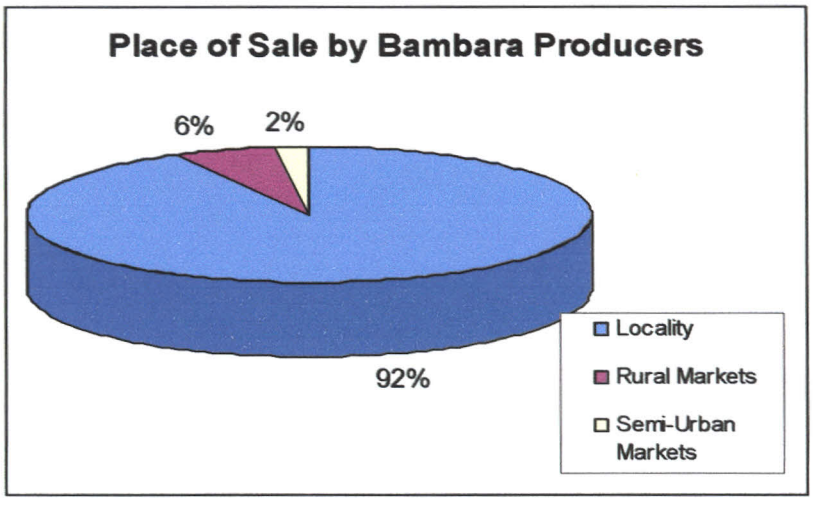


Figure1. Percentage Distribution of Producers in the Survey Areas by Place of Sale

About 92% of the bambara Producers sell their produce at their homes or local markets. Generally sales are conducted in May- June, averagely 5 months after harvest. Details on the place of sale of the producers in the various markets visited are presented in table4. Producers who visited the semi urban and the urban markets did so because of proximity advantage.

Table4. Producers Interviewed and Place of Sale

Type of Market	**% Response by bambara producers in various Towns Visited**				
	Nyamkpala	**Savelugu**	**Tampiong**	**Zinido**	**Zamashegu**
Local	100	70	91.7	100	100
Surrounding Villages	-	20	8.3	-	-
Urban/Semi Urban	-	10	-	-	-

Source: Author's Compilation

A few (13%) bambara producers sell their produce to processors (both households and food vendors) directly on the local markets. About 51% of producers interviewed depend on the activities of visiting itinerant traders only. As mentioned earlier, these itinerant traders usually employ the services of local agents to assemble produce at the rural

periodic markets, which are organized on a 6-day cycle. Producers who sell directly to local iterant traders only constitute about 12% of the sample interviewed while 6% sell to retailers. It was also realized that few farmers had to buy bmbara seeds during planting time. Table5 presents details on customers or type of buyers of bambara producers interviewed.

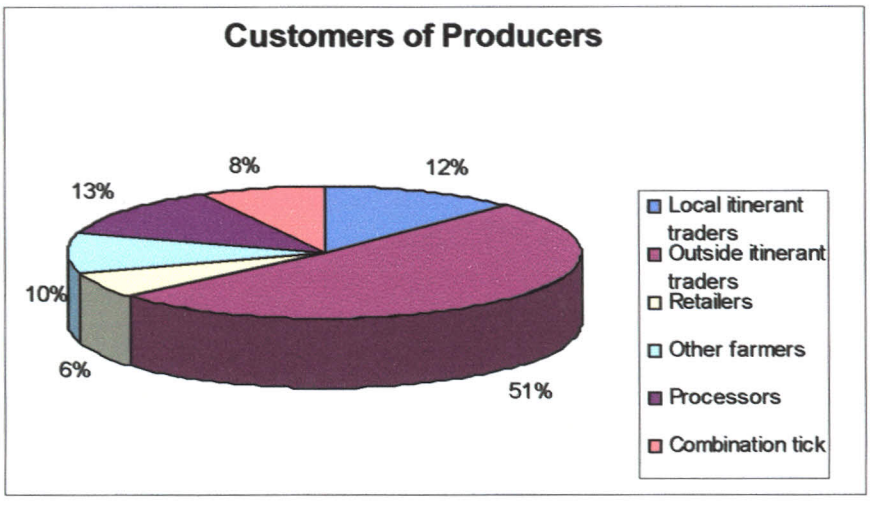


Figure2. Percentage Distribution of Producers in Survey Areas by Type of Customers

Table5. Producers and Type of Buyers at the Various Survey Areas

Type of Buyer	% Response by Bambara producers in various Towns Visited				
	Nyamkpala	**Savelugu**	**Tampiong**	**Zinido**	**Zamashegu**
Local Itinerant	40.0	22.2	-	-	-
Itinerant from outside	20.0	44.4	-	91.7	100.0
Retailer	-	22.2	9.1	-	-
Other Farmers	40.0	-	-	8.3	-
Processors	-	-	63.6	-	-
Combination Tick	-	11.1	27.3	-	-

Source: Author's Compilation

Figure3 presents the distribution outlets for bambara. The study observed that significant proportion of bambara is consumed in the North through three (3) main distribution outlets outlined below:

Producer ⟶ Processor ⟶ Consumer

Producer ⟶ Retailer/Wholesaler ⟶ Processor ⟶ Consumer

Producer ⟶ Local itinerant trader ⟶ Retailer/Wholesaler ⟶ Processor ⟶ Consumer

Again as depicted in figure3, there are relatively more bambara distribution outlets in the South with at least two levels of wholesalers. Usually after assembling or bulking at the rural and semi-rural markets in the North, the first level wholesaler (who could also be described as assembler depending on the location) sells to the second level wholesaler who usually links different markets especially, sub-urban markets to urban wholesale markets in the South. Examining the commodity flow summary table gives indication on where bambara from markets in the production centers are transported to. For instance, there were wholesalers from the south who operated between Zamashegu – Kumasi and Accra markets while others linked Techiman/Tamale markets to wholesale markets in southern Ghana (Accra, Cape Coast, Sekondi Takoradi, Tarkwa, Obuasi, Axim, etc, see table 6). Unlike other cereals and legumes, movements of bambara wholesalers are less guided by price signals and supply availability.

There was high degree of variations in the marketing seasons; while peak bambara trading period occurs in the month of January-February in the South, coinciding with the plantain season that of the North occurs in the month of May-June when other food crops are scarce. This suggests some level of collusive price-setting behaviour on the part of traders who have the capital and storage facility to store bambara (since bambara has high storage ability and therefore could be kept for long periods at any stage of the distribution channel before selling) when farmers are willing to buy and resell within the southern peak trading period. It was also gathered from this study that some amount of bambara grain is imported from Niger.

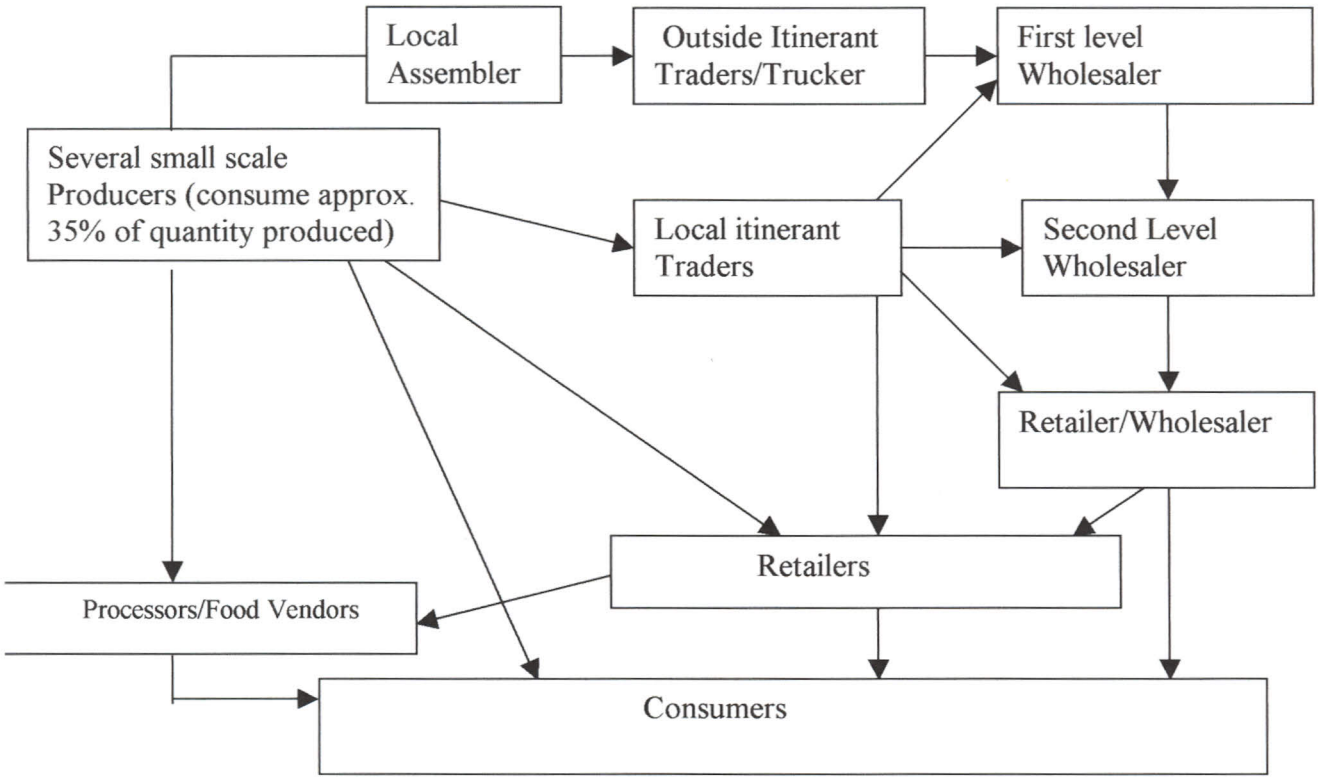


Figure3. Flow Chart Depicting Distribution Channels for Bambara

Volumes Traded

Generally volume of bambara traded is low and highly seasonal as confirmed by traders and transporters interviewed. During the off-season bambara is rarely seen on the rural market. During the peak trading season when farmers are willing to sell of their produce, a wholesaling volumes range between 5-20bags per trader per market day while retailing Volumes range between 2-5 bags per trader. A retailer/wholesaler sells between 3-12bags per market day.

Factors Affecting Volumes Traded

Pooled responses on factors affecting volumes of bambara traded are presented in table 7. The key factor affecting volumes traded at the market visited is limited demand. As expected over time, this has affected supply response as farmers do not have confidence in the demand and therefore play it safe by usually producing according to the dictates of

market forces.

Table6. Summary of Bambara Commodity Flow

Town	Source of Supply	Destination of Product
Production Center		
Zinindo	-do-	Savelugu, Tamale,
Zamashiegu	-do-	Kumasi, Accra, Gushiegu, Tamale
Nyankpala	-do-	-
Savelugu	-do-	Tamale, Kumasi, Techiman, Accra, Tarkwa, Takoradi
Tampiong	-do-	Tamale, Savelugu
Market Center		
Bolga	Limbensi, Nerigu, Walewale, Bimsi	Kumasi, Techiman, Tamale
Tamale (Aboabo)	Yendi, Kambaga	Kintampo, Techiman, Accra, Kumasi
Nyankpala	Nyamkpala and surrounding villages	
Savelugu	Gushiegu, Bakurugu, Pashigu, Tamaleku, Sung	Tamale, Kumasi, Techiman, Accra, Tarkwa, Takoradi
Techiman	Yendi, Tamale, Bole, Bupei, Hamile, Salaga, Bimbila, Wa, Walewale, Brong Ahafo, Niger and Burkina	Takoradi, Axim, Kumasi, Obuasi, Akasti, Tarkwa, Cape Coast, Ada

Source: Author's Compilation

Table7. Pooled Responses on Factors Affecting Volumes of Bambara traded

Factors	% Response			Rank
	Yes	No	No Response	
Transportation Difficulties	15.0	77.5	7.5	5
Limited Supply	52.5	40.0	5.5	2
Many Traders/Sellers	7.5	85.0	7.5	7
Lack of Finance/Credit	37.5	55.0	7.5	4
Limited Demand	55.0	37.5	7.5	1
Risk of quality Changes	0	95.0	5.0	8
Risk of Price Changes	10.0	82.5	7.5	6
Inadequate Capital	45.0	47.5	7.5	3

Source: Author's Compilation

Thus there was a high relationship between limited supply and limited demand using the Pearson Correlation method at 0.01 level of significance. The low, stagnant demand for bambara does not suggest low profit opportunities for traders. Also the fact that there were not too many traders in the distribution chain (since traders indicated that this does not significantly affect volumes of bambara traded) does not suggest any form of barrier to market entry.

Table8. Market Specific Ranking of Factors Affecting Volumes of Bambara Traded

Factors Affecting Volumes traded	Ranking at Various Markets Visited				
	Bolga	Savelugu	Tamale	Nyamkpala	Techiman
Transportation Difficulties	-	-	-	3	-
Limited Supply	2	1	4	4	-
Many Traders/Sellers	2	-	4	-	2
Lack of Finance/Credit	2	-	2	1	-
Limited Demand	1	2	3	-	1
Risk of quality Changes	-	-	-	-	-
Risk of Price Changes	-	-	4	-	3
Inadequate Capital	-	-	1	1	4

Source: Author's Compilation

Other factors that affected volumes traded at the markets visited are adequate capital, lack

of credit, transportation difficulties, risk of price changes, too many traders and risk of quality deterioration in decreasing order of importance. Location specific ranking of factors affecting volumes traded is presented in table 8.

D. PRICES AND MARKETING MARGINS

Prices

Prices, whether those received by farmers or charged to wholesalers, processors, and final consumers are the most important elements in the marketing system in influencing the contribution of agriculture to economic development. Major investments in the improvements of marketing infrastructure will be ineffective if the prices generated within the system are inefficient (Feldman and Ohene-Yankyerah, 1984). Data on prices at the various levels of the distribution chain is used in calculating the marketing margins.

Table 9 presents prices of bambara at the farmgate or the farmer's houses level. For the purposes of this study, the 'index farmgate price' which forms the basis of comparisons of prices for the marketing margin analysis is generated from taking the average of all the prices at the various production centers visited as shown below. It must be noted that in Ghana, most traders who handle cereals and legumes use the koko bowl measure. It is not uncommon for a trader to sell at the original purchase price, but because of the use of the measure as a unit still makes quite a handsome profit from changes in the weight of different bowl sizes. The rural assembler, wholesale and retail prices of bambara are also generated from the origin and destination price analysis for both peak and lean seasons presented in table 10. The origin market prices are the prices pertaining at the sources of supply while the destination market prices refer to prices at the demand side markets (See commodity flow table). Unfortunately, there were variations in the seasonality of prices in the southern and northern markets as indicated elsewhere in this report. Peak bambara trading period occurs in the month of January-February in the South, coinciding with the plantain season that of the North occurs in the month of May-June when other food crops are scarce. Differences in harvesting and trading seasons create misinterpretation of peak and lean periods. In the case of bambara, peak trading period is not the harvesting period

but rather the time when farmers are willing to sell. At the time of harvesting bambara is rarely seen on the rural markets and therefore signifies the lean trading season.

Table9. Analysis of Farm gate Price

Areas Visited	Descriptive Statistics of Farmgate Prices / bowl			
	Min	Max	Mean	Std. Dev
Nyamkpala	5000	6000	5500	840
Savelugu	5000	7000	5300	973
Tampiong	4500	6000	5000	820
Zinindo	4500	6000	4600	930
Zamashiegu	4500	6000	4670	580
Total Average	-	-	5014	-

Source: Author's Compilation

Table10. Price Analysis at Traders Level

	Price/Bowl at Origin Markets (GHC)							
	Peak Season				Lean Season			
	Min	Max	Mean	Std. Dev	Min	Max	Mean	Std. Dev
Bolga	5000	5500	5259	353	6000	8000	7333	1154
Savelugu	5000	5000	5000	-	7000	8500	7750	1060
Tamale	4000	6000	5000	634	6000	10000	7350	1055
Nyamkpala	4500	6000	5285	487	7000	9500	7785	1074
Techiman	5000	6500	5571	583	9000	10000	9250	452
	Price/Bowl at Destination Markets (GHC)							
	Peak Season				Lean Season			
	Min	Max	Mean	Std. Dev	Min	Max	Mean	Std. Dev
Bolga	6000	6000	6000	-	9000	10000	9500	701
Savelugu	6000	6500	6250	707	9500	9500	9500	-
Tamale	5000	7000	5600	658	7000	12000	8300	1398
Nyamkpala	5000	7000	6071	607	8000	10000	8714	951
Techiman	5500	10000	6428	1141	10000	11000	10208	396

Source: Author's Compilation

Varietal Preference and Pricing

Bambara varieties found on the markets are white/cream, red, dark and a mixture of all colours. There were price differentials with respect to varieties on the market. The study revealed that the cream/white variety attracts the premium price; a difference of

c1000/bowl above the selling price of the other varieties. It was however, indicated by some of the traders that the red variety from Niger was preferred mostly by consumers who use bambara for sauce.

Price Determination

Pricing of bambara like many agricultural commodity is not controlled by any external force; usually the price of a commodity on the previous market day becomes the basis for negotiation. At the producer level, price determination is highly influenced by negotiation with a buyer initially but once price settles at some point the going or current price for a particular market day is taken by all.

Table11. Pooled Responses on Mode of Price Determination

Mode	% Response at Producer Level		% Response at Trader Level	
	No	Yes	No	Yes
Negotiation with a broker	97.7	2.3	91.9	8.1
Negotiation with a buyer	11.9	88.1	35.1	64.9
A Certain mark-up on a buying price	88.4	9.3	73	27
Current Price	26.2	73.8	16.2	83.8
A price set by trader Association	74.4	23.3	81.1	18.0
A price fixed by the owner	55.8	44,2	62.2	37.8

Source: Author's Compilation

Usually, producers who visit trading centers or urban and semi urban markets who are supposed to be agents of price transmission to other producers, are deceived by the false weights of the bowl measure used. Supposedly unattractive margins could therefore become disincentive for some farmers to transport their produce to such markets for sale. Some producers also expressed a significant influence of urgent cash needs on price determination. Table 11 presents pooled responses on factors affecting mode of price determination at producer and trader levels. Mode of payment at farm gate is purely cash and carry. However an appreciable level of retailing is on 'sale or return' basis.

Marketing Margin Analysis

The term marketing margin is commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity (Tomek and Robinson, 1990). However, it may also describe price differences between other points in the marketing chain. It is a price charged for providing a mix of marketing services-assembling, Transportation, Handling, Packaging, Storage, etc, etc.- plus profit.

Under competitive conditions, the size of marketing margins would be the outcome of the supply and demand for marketing services, and they would equal the minimum costs of service provision plus 'normal' profit, where normal profit refers to the least payment the owner of an enterprise would be willing to accept for performing the entrepreneurial function including risk-taking, management etc,etc. However, under oligopsonistic conditions, collusive price-setting behaviour that weakens the position of the farmer exists. This causal relationship implies that equity issues can be resolved by improving market structures. Thus marketing margins are major determinants of the efficiency of resource allocation in production, distribution and consumption. It is an important means of assessing the efficiency of price formation and transmission through the distribution system. Some researchers argue that lowering of marketing margins is the most efficient and sustainable short-run means of solving the dilemma between producer's desire for higher prices and consumer for lower food prices. It should be noted that unless marketing is competitive, lowering the cost of marketing would not necessarily benefit producers or consumers. Similarly unless consumers' preferences are responded to lowering the gross margin will not benefit them. Thus improving technical or operational efficiency without simultaneously addressing exchange or economic efficiency prevents such potential from being realized.

The village and urban markets constitute the most important market levels in the Ghanaian food industry. Each one of these serves as a link in a chain of institutions affecting the marketing process. Marketing charges link prices at each of these levels and consumers serve as the prime movers of the whole process. Farmers are naturally inclined to think that any current system of marketing is costly in relation to the services

given, and that all traders absorb too high a proportion of the final prices paid by consumers. Though this assertion could be true, farmers either have no choice or are reluctant to take the risk involved in marketing services and thereby increasing the level of producer participation margin.

Using the Estimation procedure below, the gross marketing margins at the various levels of the distribution chains are calculated and results presented in table 12. The key trader levels in the distribution chain identified include farmgate, rural assembly level, wholesale level 1, wholesale level 2 and retail level. Average prices at these levels are generated from trader responses. The producer participation contribution is then calculated by deducting the total gross margin from 100% as indicated in the estimation procedure. As revealed in the analysis, bambara producers interviewed did not indicate any marketing charges since sale of produce was mostly effected at their homes. Although bambara is stored for sometime before selling farmers could not provide information on storage charges.

It must be noted that the differences in the number of bowl measures constituting a bag at the various distribution levels were considered in the gross margin analysis. A bag of bambara contains average of 35 bowls and 40 bowls at the farm gate and retail level respectively, suggesting the need to standardize units of measurement for most Agricultural commodities for efficient pricing system.

$$\textbf{TGMM} = \frac{\textbf{Retailing Price – Farm gate Price}}{\textbf{Retailing/Consumer Price}}$$

$$\textbf{TGMM}_{RA} = \frac{\textbf{Rural Assembler Price- Farm gate Price}}{\textbf{Retailing /Consumer Price}} * 100$$

$$\textbf{GMM}_{W} = \frac{\textbf{Wholesale Price - Rural Assembler Price}}{\textbf{Retailing /Consumer Price}} * 100$$

$GMM_r = \frac{\text{Retailing Price – Wholesale Price}}{\text{Retailing /Consumer Price}} * 100$

$NMM = TGMM\text{-}TMC$

$GMM_p = 100\% - TGMM$

Where TGMM is Total Gross Marketing Margin

$TGMM_{RA}$ is the percentage of the total gross marketing margin received by the rural assembler

GMM_W is the percentage of the total gross marketing margin received by the wholesaler

GMM_r is the percentage of the total gross marketing margin received by the retailer

GMM_p is the producer participation margin

TMC is the total marketing charges

NMM is the Net Marketing Margin

Table12. Results on Gross Marketing Margins Analysis

Prices at various levels of the Distribution Channel	GHC/Bowl	No. of Bowls/Bag	(GHC/Bag)	Gross Marketing Margins
Average Farm gate Price	5000	35	175000	-
Average Rural Assembler Price	5223	38	198474	-
Average Wholesale Price (Level 1)	6069	38	230622	-
Average Wholesale Price (Level 2)	6428	40	257120	-
Average Retailing Price	7500	40	300000	-
TGMM	-	-	-	41.66%
GMM_{RA}	-	-	-	7.82%
GMM_{W1}	-	-	-	10.72%
GMM_{W2}	-	-	-	8.83%
GMM_R	-	-	-	14.29%
GMM_P	-	-	-	58.34%

Table13. Marketing Charges at Various Levels of the Distribution Chain

Cost Item	Marketing Charges (GHC)			
	Rural Assembly	**Wholesale Level 1**	**Wholesale Level 2**	**Retail Level**
Transportation	4000	6000	4000	-
Storage	-	5000	2000	-
Market Toll	-	1000	1000	500
Handling & Packaging	2000	4000	2000	1000
Total	6000	16000	9000	1500
Total as % of Retail price	2.00	5.30	3.00	0.50
GMM (%)	7.82	10.72	8.83	14.29
NMM (%)	5.82	5.42	5.83	13.79

Results of the marketing margins analysis showed a total gross marketing margin of 41.66% with producer participation margin of 58.34%. The gross marketing margin for bambara is rather on the high side as compared to that of sorghum which is about 30%. Approximately 11% out of a total gross marketing margin of 41.66% constitutes the total marketing charges, giving a net marketing margin of 30.66%. Although this suggests an appreciable level of abnormal profits reaped by traders, volumes traded are relatively low as compared to other cereals and legumes. Again disaggregating total net marketing margins by the key traders along the distribution chain indicate that retailers absorb a higher proportion of the total which compensates for the low volumes traded. However, there is a fair representation of profit allocation among assemblers and wholesalers.

E. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- Generally, bambara is a low volume traded product at both wholesale and retail levels as compared to other legumes and has limited distribution outlets.

- Approximately 35% of volumes of bambara produced is utilized by the producer-households either as food and/or seed.
- About 92% of the bambara Producers sell their produce at their homes or local markets probably because of convenience and the perception that traders are better placed to take marketing responsibilities.
- Sales are usually effected 5months after harvesting (May-June), when food is scarce and demand is high. However, high demand in the South coincides with the plantain season which occurs in January-February.
- A few (13%) bambara producers sell their produce to processors (both households and food vendors) directly on the local markets. About 51% of producers interviewed depend on the activities of visiting itinerant traders only. Producers who sell directly to local iterant traders only constitute about 12% of the sample interviewed while 6% sell to retailers.
- The bambara marketing structure could be classified as an oligopsonistic one, having few buyers. Pricing is based largely on negotiation/bargaining power, than with the true value of the product and the position of the producer in price formation is weak.
- Consumers have little knowledge of bambara based products
- The Total Gross Marketing Margin for bambara is estimated at 41.66% with Producer Participation Margin of 58.34%. Total Marketing Charges is approximately 11%; giving a Total Net Marketing Margin of 30.66%.

Recommendations

- Develop consumer educational programs focusing on the contribution of bambara to health and nutritional requirements as well as its unique flavour
- Focus market expansion effort on both bambara consumers and non bambara consumers using value based marketing strategy since attracting new consumers to the bambara industry is the key to improving the level of price competition and extent to which the forces of supply and demand determine price

- Develop a viable bambara market information system to improve on price formation and transmission through the distribution system as well as the efficiency of resource allocation among farmers and traders
- Consumer preference for bambara variety from Niger in the South should be further investigated into
- A post storage survey would have to be conducted in May/June 2004 with much emphasis on proportions of bambara grain traded at various stages of the distribution chain to support data gathered for the current study.

APPENDIX 1

QUESTIONNAIRE ON BAMBARA - PRODUCERS

A. SOCIO-ECONOMIC PROFILE OF RESPONDENTS

i. Respondent code Number..... **iii. Name of market.....**

ii. District..... **iv. Date of interview .....**

v. Region..... **vi. Name of respondent .....**

1. Sex ☐

Male =1 female =2

2. Age ☐

3. Educational level ☐
No formal education =1 Primary/JSS/Middle =2
Secondary/SSS =3 others (specify) =4.....

4. Religion ☐
Christian =1 Moslem =2
Traditionalist=3 others (specify) =4.....

5. Marital status ☐
Married =1 Single =2 Divorced =3
Separated =4 Widowed =5

6. Family size ☐

7. Main occupation ☐
Trading =1 farming =2 fixed-salary based job =3
Others (specify) =4 .....

☐

B. Production

8. Indicate how your last harvest was distributed

Last harvest	Response
Area of cultivation	
Quantity harvested	
Quantity utilized	
Quantity sold	
Gifts if any	

9. Type of variety cultivated

Variety*	Proportion sold **	Price sold

** proportion out of 10

10. Description of sale

Quantity	
Time of sale (months after harvest)	
Price	
Place of sale	
Type of buyer	
Source of buyer	
Method of payment	

11. Indicate any change in buyers from one marketing season to another

C. Price determination

12.. How do you determine price?

Mode	Response (1=yes 2 =no)	Rank (1=most important)
Negotiation with a broker/commission agent		
Negotiation with a buyer		
A certain mark –up on a buying price		
The current market price		
A price set by trader association/union		
A price fixed by the owner		
Other (specify)		

13. What factors influence price determination?
1Road conditions 2.Transportation mode 3.Distance 4.Supply and demand co□ion
5. Traders margin 6.Others (specify)

D. Mode of transportation

22. What mode of transport do you use?

Stage of movement	Mode of transport
Farm-gate to assembly point Assembly point to local market Local market to urban/sub urban market	

1.headload 2.Vehicle (indicate……) 3. Draught animal 4.other (specify)……

23. Transaction cost:

Transportation	Type of vehicle	Distance involved	Cost/unit volume
Storage	Type of storage	Duration of storage	Cost/unit
Taxation	Type		Tax/unit
Handling & Packaging	Loading	Unloading	Cost/unit

Constrains (rank in decreasing order of importance)

APPENDIX 2

QUESTIONNAIRE ON BAMBARA - TRADER

A. SOCIO-ECONOMIC PROFILE OF RESPONDENTS

i. Respondent code Number..... iii. Name of market.....

ii. District..... iv. Date of interview .....

v. Region..... vi. Name of respondent .....

1. Sex

Male =1 female =2 ☐

2. Age ☐

3. Educational level ☐
No formal education =1 Primary/JSS/Middle =2
Secondary/SSS =3 others (specify) =4.....

4. Religion ☐
Christian =1 Moslem =2
Traditionalist=3 others (specify) =4.....

5. Marital status ☐
Married =1 Single =2 Divorced =3
Separated =4 Widowed =5

6. Family size ☐

7. Main occupation ☐
Trading =1 farming =2 fixed-salary based job =3
Others (specify) =4 .....

8. Secondary occupation ☐

9. Type of trader ☐
Wholesaler =1 retailer =2 wholesaler/retailer =3
Commission agent =4 others (specify) =5 .....

10. Number of years of trading in Bambara ☐

B. MAJOR SOURCES OF SUPPLY

11. What type of producer or trader sells to you? *(Rank* in order of importance)

Source of product (town/village)	Response (Yes =1, No =2) Price/bag	Rank (1=most important)
Own farm product		
Individual farmer		
Farmer groups		
Other farmers		
Other (specify)		

12. Do you belong to any association? ☐
Yes =1 No =2

13. If yes, what services do these associations provide to their members?

Services	Response (1=yes, No =2)
Loans or Credit	
Information on prices	
Co-operative buying	
Transport	
Rules on weight and measures	
Agreement on selling prices	
Other specify	

C. SEASONAL VARIATIONS IN SUPPLY AND PRICES

14. For bambara traded in this market in which month(s) are the prices highest or lowest?

Product	Purchasing price	Selling price	Highest price/month		Lowest price month	
			Origin market	Destination market	Origin market	Destination market

15. In which month(s) are volumes traded highest ..... bags sold/day.....
16. In which month(s) are volumes traded lowest..... bags sold/day/week.....

D. FACTORS AFFECTING VOLUMES TRADED

17. What are some of the factors that affect the volumes traded?

Factors affecting	Response (1 =yes 2 = No)	Rank (1=most important)
Transport difficulties		
Limited supply		
Too many other traders		
Lack of finance or credit		
Not enough customers		
Risk of quality deterioration		
Risk of price changes		
Not enough capital		
Other (specify)		

E. DESTINATION OF MAJOR CUSTOMERS OF TRADER

18. Who buys your product in this market?

Name of buyer (place)	Response (1=yes 2 =no)	Rank (1 =most important)
Final consumer		
Local retailer		
Processor		
Trader who sells in another market		
Commission agent		
Other (specify)		

19. If more than one type of buyer, how many parts out of 10 of your total sales are sold to the most usual buyer?.....

F. MODE OF PRICE DETERMINATION

20. How do you determine price?

Mode	Response (1=yes 2 =no)	Rank (1=most important)
Negotiation with a broker/commission agent		
Negotiation with a buyer		
A certain mark –up on a buying price		
The current market price		
A price set by trader association/union		
A price fixed by the owner		
Other (specify)		

21. What factors influence price determination? ☐

1Road conditions 2.Transportation mode 3.Distance 4.Supply and demand condition
5. Traders margin 6.Others (specify)

G. TYPE OF VARIETY SOLD, SOURCE, PROPORTIONS AND PRICE SOLD

Variety*	Proportion sold **	Source	Price sold

** Proportion out of 10

H. MODE OF TRANSPORTATION

22. What mode of transport do you use?

Stage of movement	Mode of transport
Farm-gate to assembly point Assembly point to local market Local market to urban/sub urban market	

1.headload 2.Vehicle (indicate……) 3. Draught animal 4.other (specify)……

23. Transaction cost:

Transportation	Type of vehicle	Distance involved	Cost/unit volume
Storage	Type of storage	Duration of storage	Cost/unit
Taxation	Type		Tax/unit
Handling	Loading	Unloading	
Packaging	Type	Cost/unit	
Other (specify)			

I FINANCING

24. How do you finance your marketing activities?……
25. If borrowed funds state interest charges……