

## **Marketing of Agricultural Produce among Rural Farm Households in Nigeria: The Case of Sorghum Marketing in Benue State**

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### **Abstract**

*This study examined sorghum marketing among rural farm households in Nigeria. Data were collected from randomly sampled 100 sorghum marketers in Benue State using a structured questionnaire. Data were analyzed using frequency distribution and percentages as well as marketing margin analysis and t-test statistic. The marketing margin of an average sorghum marketer in the study area was 34.43%. This implies that 100% retail price paid by the final consumer resulted in farm-to-retail price spread (marketing margin) of 34%. An average sorghum marketer in the study area earns a farm-to-retail price spread of 0.34 Naira for every 1 Naira retail price paid by the final consumer in the marketing process. The marketers in the study area had significant marketing margin during their marketing transaction. The welfare of sorghum marketers was fully derived from the business which they transact, suggesting that sorghum marketing serves as a source of livelihood for the respondents.*

**Keywords:** marketing, agricultural produce, rural, farm households, sorghum marketers

### **1. Introduction**

Agriculture provides primary means of employment for Nigeria and account for more than one third of the total gross domestic product (GDP) and labour force. As food situation in Nigeria worsen after the 1960s, also physical absence of improved inputs and modern techniques of production were perceived as constituting problems. In recent years, the global fall in oil price and oil demand coupled with other inflationary and devolutionary problems, which crippled foreign exchange forced governments at state and federal levels to introduce measures geared towards revamping the economy and putting agriculture into proper shape. Sorghum (Guinea corn) is one of the major food stuff in Nigeria, and its grain provides an ingredient for many unique indigenous food and beverages in Nigeria.

Marketing is defined as a process of satisfying human needs by bringing products to people in the proper form and at a proper time and place. Marketing has economic value because it gives form, time, place, utility to products and services.

The marketing of agricultural products begins at the farm when the farmer harvests his products. The product when it is harvested cannot usually go directly to the consumers. Firstly, it is likely to be located some distance from the place of consumption in regular and continuous manner throughout the year. Secondly, storage is required to adjust supply to meet demand. Thirdly, a product when it has been harvested is rarely in a form acceptable to consumers. Therefore, it must be sorted, cleared and processed in various ways and must be presented to the consumer in convenient quality and quantities for sale. Finally the farmer expects payment when his produce leaves his possession, and hence some financial arrangements must be made to cover all the various stages until the retailer sells the products to the final consumer.

Marketing covers all business functions including production and in its broadest sense, it also covers production decision. So it can be argued that in farming such decision as the variety of crops to grow or the breed of animal to keep are marketing decisions. The primary role of an integrated marketing system is to add form, place, time and possession utility, so that the subjective satisfaction of consumers is maximized. Barker (1989) stated that there is no universally accepted definition of marketing indicating the variety of opinions which exist concerning the subject.

Kotler (1972) give a very concise definition that marketing is the set of human activities directed at facilitating and consummating exchange. Kempner (1976) noted that marketing is the process in a society by which the demand for economic goods and services is anticipated or enlarged and satisfied through the conception, physical distribution and exchange of such goods and services. Hence with any individual company which is attempting to satisfy demands of this nature, there must always be marketing process. The success of the enterprise will depend on the ability of the management to give satisfaction and to obtain the appropriate net profit.

Olukosi and Isitor (1990) defined agricultural marketing as the performance of all activities which direct the flow of goods and services to the consumer from the producers (farmers) in order to accomplish the producer's objectives. Many people consider marketing as equivalent to selling or transferring the product to another person for a price. Selling is central on the micro concept of marketing but it is only part of it. According to Olukosi and Isitor (1990), marketing includes packaging, storage, transportation, pricing, financing, risk bearing and even product design. They also observed that agricultural marketing involves all those physical, legal and economic services, which are necessary to make products from the farm available to the consumers. Thus creating of form, place, time, and possession utilities is derived from agricultural marketing.

Kohls (1985) stated that agricultural marketing is the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumer. From this definition it can be seen that groups with varying interest will view marketing differently. Consumers will be interested in purchasing what they can at lowest possible cost and farmers it might be assumed, will be interested in obtaining the highest possible returns from sale of their products. The major reason why Kohl's definition is so relevant to agricultural sector is because it can be used to determine which business activities can be properly regarded as a neutral element by the farmer and this is worthy of his serious consideration.

Idachaba, (1987) noted that bumper harvest of 1985 and 1986 have accorded new respectability to the view point that Nigeria's central problem is not production parse but marketing and distribution. According to Oyewole (1976), transportation and storage cost and losses due to spoilage constitute the main causes of high cost in the marketing of agricultural products.

The major cereal crops in Nigeria are rice, maize, sorghum, wheat, pearl and millet. Sorghum is the next important after maize. As a result, the National Cereal Research institute has made some remarkable progress in developing improved sorghum (guinea corn) varieties for different ecological zones of the country in order to provide sufficient good quality of sorghum for the growing population. This can be enhanced if they are subjected to economic analysis to determine their economic and extension implications.

Sorghum as a major cereal crop in Nigeria, account for about 50% of the total cereal crop production in Nigeria and occupies about 45% of the total land area devoted for cereal production in the country, (National Extension Agricultural Research and Liaison Service (NEARLS, 1996). Jongur and Ahmed (2008) observed that farmer's margin was as high 96.81% and 3.19% went to middlemen involved in sorghum marketing. They also found that wholesalers' net margin per 100Kg bag was N133.20 and N7.71 per 100 Kg bag for retailers. The study reveals that sorghum marketing system was performing fairly efficient in Adamawa central zone.

It is believed that the nation is experiencing a down trend in the tonnage of sorghum produced. The land used for cultivation is decreasing and the sorghum producers divert production efforts to the production of other crops that seem more promising. This problem could be attributed to the cropping requirement of sorghum and poor marketing system which is manifested in farmers receiving less for much work and middlemen receiving much for less work done and consumer paying much for little food items. Absence of marketing facilities such as storage, transportation and processing could also have aided the problem.

The focus of this study therefore, is to examine sorghum marketing among rural farm households in Nigeria. The specific objectives of the study are to:

- i. analyse the socio-economic characteristics of sorghum marketers in the area;
- ii. investigate the market structure of sorghum in the study area;
- iii. determine the marketing margin of sorghum in the study area;
- iv. examine the distribution channels of sorghum marketing in the study area; and
- v. identify the problems of sorghum marketing in the study area.

The study also tested the hypothesis that there is no significant difference between retail price and farm price of sorghum marketing among the respondents.

## 2. Methodology

### 2.1 The Study Area

Benue State is one of the 36 states of Nigeria located in the North-Central part of Nigeria. The State has 23 Local Government Areas, and its Headquarters is Makurdi. Located between Longitudes  $6^{\circ} 35' E$  and  $10^{\circ} E$  and between Latitudes  $6^{\circ} 30' N$  and  $8^{\circ} 10' N$ . The State has abundant land estimated to be 5.09 million hectares. This represents 5.4 percent of the national land mass. Arable land in the State is estimated to be 3.8 million hectares (BENKAD, 1998). This State is predominantly rural with an estimated 75 percent of the population engaged in rain-fed subsistence agriculture. The state is made up of 413,159 farm families (BNARDA, 1998) and a population of 4,219,244 people (NPC, 2007). These farm families are mainly rural. Farming is the major occupation of Benue State indigenes. Popularly known as the "Food Basket" of the Nation, the State has a lot of land resources. For example cereal crops like rice, sorghum and millet are produced in abundance. Roots and tubers produced include yams, cassava, cocoyam and sweet potato. Oil seed crops include pigeon pea, soybeans and groundnuts, while tree crops include citrus, mango, oil palm, guava, cashew, cocoa and *Avengia spp.*

### 2.2 Sampling Technique

Benue State is divided into three (3) agricultural zones viz: Zone A, Zone B and Zone C. The sampling frame for this study consists of the rural farm households involved in sorghum marketing in Benue State. Purposive sampling technique was employed to select the areas with high concentration of sorghum production in Benue State. From the list of the sorghum marketers in these high concentration sorghum production areas, 100 sorghum marketers were selected through simple random sampling technique.

### 2.3 Data Collection

Data were collected from primary sources only. Primary data were collected through the use of a structured questionnaire, copies of which were administered on the 100 sorghum marketers selected for the study.

### 2.4 Method of Data Analysis

Data collected were analysed using both description statistics and inferential statistics. Description statistics such as frequency distribution and percentage were used to analyse specific objectives i, iii, iv and v, whereas specific objective ii was analysed using market margin analysis. Furthermore, t-test analysis was used to test the null hypothesis.

### 2.5 Model Specification

#### 2.5.1 Marketing margin

The market margin or the farm-to-retail price spread is the difference between the farm value and the retail price. It represents payments for all assembling, processing, transporting, and retailing charges added to farm products (Elitzak, 1996). Marketing margin can be computed using the formula:

$$\text{Marketing margin (MM)} = \frac{\text{Selling price} - \text{supple price}}{\text{Selling price}} \times 100 \quad 1$$

Where,

Selling price is the retail price at the consumer end

Supply price is the farm price at the producer end

### 2.5.2 Independent two-sample *t*-test

This test is only used when both:

- the two sample sizes (that is, the number, *n*, of participants of each group) are equal;
- it can be assumed that the two distributions have the same variance.

The *t* statistic to test whether the means are different can be calculated as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{X_1X_2} \cdot \sqrt{\frac{2}{n}}}$$

where

$$S_{X_1X_2} = \sqrt{\frac{1}{2}(S_{X_1}^2 + S_{X_2}^2)}$$

Here  $S_{X_1X_2}$  is the grand standard deviation (or pooled standard deviation), 1 = group one, 2 = group two. The denominator of *t* is the standard error of the difference between two means.

For significance testing, the degree of freedom for this test is  $2n - 2$  where *n* is the number of participants in each group.

## 3. Results and Discussion

### 3.1 Socio-economic Characteristics of the Respondents.

#### 3.1.1 Sex

Table 1 shows that majority (77%) of the respondents involved in sorghum marketing are males while 23% are females. The dominance of sorghum marketing by males in the study area is a pointer to the belief in the study area that women are supposed to stay at home and in the farm while men struggle for survival through such business. Moreover, women lack exposure to the business. This is because the business requires a lot of energy and is labour intensive, involving moving from one place to another assembling the products for marketing.

#### 3.1.2 Age

The result in Table 1 shows that the age of the respondents ranging between 31 and less than 40 years is predominant with 42%. Also 32% of the respondents are of the age of between 20 and less than 30 years.

The implication of the foregoing result is that sorghum marketing in the study area enjoys higher patronage by the young people who are energetic enough to withstand the stress involved in the business. This result suggests that majority of sorghum marketers in the study area are young farmers who are within the age bracket in which people are innovative and active at work (Asiabaka, 1998). These farmers therefore can make meaningful impact in sorghum marketing when adequately motivated with the needed marketing facilities.

#### 3.1.3 Educational level

Table 1 shows that majority of the respondents (54%) had secondary education. This result suggests that most of the respondents are literate enough to give room for effective communication in doing their sorghum marketing business in the study area. This is acceptable on the ground that education affects the way farm business is managed as well as overall production (Nkang et al., 2009). Educational level plays a good role in adoption of new policy and undertaking risks.

### 3.2 Marketing Structure of Sorghum Marketing in the Study Area

#### 3.2.1 Membership of Marketing Association

Table 2 shows the percentage distribution of respondents by membership of marketing association. The result shows that majority of the respondents (93%) subscribed to the membership of marketing association, whereas 7% did not subscribe to the membership of marketing association. Those involved in Sorghum Marketing Association did so because of easy access to extension services, market and credit facilities.

Basorun and Olakulehin (2007) observed that most fish farmers joined the Fish Farmers Association because of the results achieved by members, mostly in terms of the association's link to markets, credit facilities and extension services.

### **3.2.2 Freedom of Entry and Exit**

The result in Table 2 shows that most of the sorghum marketers (91%) in the study area agreed that there is freedom to buy and sell their sorghum anywhere, while 9% disagreed that there is freedom to buy and sell their sorghum anywhere. This implies that sorghum marketing in the area is structured in such a way that there is ease of entry and exit as well as freedom for buying and selling of sorghum in the study area.

### **3.2.3 Free Flow of Market Information**

Table 2 indicates that 89% of the respondents agreed that there is free flow of price information in the marketing of sorghum in the study area while 11% do not agree that there is free flow of price information in the study area. This implies that there is sufficient and good knowledge of price information among the respondents.

### **3.2.4 Price Fixing**

Table 2 shows that 70% of price fixing was by bargaining, 12% was due to quantity traded, 15% was due to current price, and 3% by from group decision. This indicates that price fixing among the respondents was majorly by bargaining, suggesting that the market forces determine the price of sorghum among the respondents.

### **3.2.5 Sourcing of Marketing Information**

Table 2 shows that, the respondents obtained their marketing information mostly from middlemen (80%). However, 15% of the respondents obtained market information from marketers association or union, and 5% from media. This indicates that the middlemen have much influence on marketing activities that take place within the study area as regards the supply of marketing information.

### **3.2.6 Varieties of Sorghum Marketed**

Table 2 shows that 90% of sorghum marketers market white sorghum, while 10% of sorghum market red sorghum. White sorghum gained dominance over red sorghum. White sorghum gained dominance over red sorghum because the white sorghum is of higher quality, tasteful, low in acidity when compare to red sorghum. White sorghum can also be used in making beer, where as the red is mostly used in preparation of local beer (*burukutu*) and so its demand is lesser in the study area.

## **3.3 Marketing Margin of an Average Sorghum Marketer**

Table 3 presents the marketing margin of an average sorghum marketer in the study area. The result shows that the average farm price is 2,000.00 Naira per bag (or per 100 kilograms) of sorghum while the retail price is 3,050.00 Naira per bag (or per 100 kilograms). This indicates that marketing margin of an average sorghum marketer in the study area is 34.43%. This implies that 100% retail price paid by the final consumer result in farm-to-retail price spread (marketing margin) of 34%. In order words, an average sorghum marketer in the study area earns a market margin (farm-to-retail price spread) of 0.34 Naira for every 1 Naira retail price paid by the final consumer in the marketing process. This represents payments for all assembling, processing, transporting, and retailing charges added to farm products. The low level of the marketing margin of the respondents is largely attributable to the exploitative activities of the middlemen.

This finding contradicts the observation of Jongur and Ahmed (2008) that farmer's margin was as high 96.81% and 3.19% went to middlemen involved in sorghum marketing in Adamawa central zone. This is attributable to the highly exploitative activities of middlemen in the study area.

## **3.4 T-test of no Significant Difference between the Retail Price and Farm Price of Sorghum among the Respondents**

The result of the t-test in Table 4 rejects the null hypothesis that there is no significant difference between the retail price and farm price of sorghum among the respondents. This suggests that the sorghum marketers in the study area had significant marketing margin (farm-to-retail price spread) during their marketing transaction. The t-test analysis of no significant difference between the retail price and farm price of sorghum among the respondents gave a t-calculated value of 65.28.

The average retail price of sorghum was 3,050.00 Naira per bag (or per 100 kilograms) of sorghum and average farm price of sorghum was 2,000.00 Naira per bag (or per 100 kilograms) of sorghum. At 1% level of significance, t-value at 198 degrees of freedom is 1.65 (one-tail test) and 1.97 (two-tail test). From the p-value, both for the one-tail test and the two-tail test, it is therefore inferred that at this level of significance sorghum marketers in the studied area earned significant marketing margin. This is based on the ground that the t-calculated (65.28) is greater than the t-tabulated (1.97).

### **3.5 Social Benefits of Sorghum Marketing**

Table 5 shows that out of the revenue generated by marketers of sorghum in the study area, 26% was spent on training children in school, 14% was on employment, 6% was on building modern houses, 3% was on cars and 51% was on both training children in school and building modern houses. This indicates that the welfare of sorghum marketers was fully derived from the sorghum business they transact. This suggests that sorghum marketing serves as a source of livelihood for the respondents.

### **3.6 Distribution Channels of Sorghum Marketing in the Study Area**

#### **3.6.1 Channel of Distribution of Sorghum**

The result in Table 6 shows that farmers are the major source of sorghum marketers' supply of sorghum accounting for 76% of the supply, local marketers account for 21%, middlemen account for 3%. This indicates that the study area is highly productive in sorghum production.

#### **3.6.2 Channel of Sales of Sorghum**

The result in Table 7 shows that sorghum marketers sell their sorghum mostly to marketing agents accounting for 70% sales, retailers 8%, wholesalers 20%, and individuals 2%. This indicates that marketing agents are the main persons that purchase the products of the respondents and have great influence in the sorghum market in the study area. This is largely responsible for the low level of market margin earned by the respondents.

#### **3.6.3 Place of Sales**

Table 8 shows that 65% of the respondents sold their sorghum in the market square, 20% at the road side, 10% at farm and 5% by hawking their products. This shows that majority make their sales at market place which means almost all the respondents make their sales in the market for effective marketing of their products.

### **3.7 Problem of Sorghum Marketing among the Respondents**

Table 9 shows that most common obstacle faced by sorghum marketers in the study area is majorly from high taxes during transportation (48%). Others include poor rural roads (25%), lack of central market (1.7%), robbery (3%), accidents (5%) and pest (2%). This indicates that the high expenditure incurred by the marketers especially due to poor roads, high or multiple taxes during transportation increase the market costs which seriously reduce the market margin coupled with the exploitative activities of the middlemen.

## **4. Conclusion**

The result of the study showed that sorghum marketing is dominated by males in the study area. Furthermore, sorghum marketing in the study area enjoys higher patronage by the young people who are energetic enough to withstand the stress involved the business. Most of the sorghum marketers in the study area are literate enough to give room for effective communication in doing their sorghum marketing business in the study area. Sorghum marketing in the area is structured in such a way that there is ease of entry and exit as well as freedom for buying and selling of sorghum in the study area. There is also sufficient and good knowledge of price information among the respondents. Furthermore, price fixing among the respondents was majorly by bargaining, suggesting that the market forces determine the price of sorghum among the respondents. In addition, middlemen have much influence on marketing activities that take place within the study area.

The result further showed that marketing margin of an average sorghum marketer in the study area is 34.43%. This implies that 100% retail price paid by the final consumer result in farm-to-retail price spread (marketing margin) of 34%. The marketers in the study area had significant (difference between the retail price and farm price of sorghum) marketing margin during their marketing transaction. The findings of the study further indicated that sorghum marketing is profitable in the study.

There was significant difference between the consumer price and the farm price of sorghum among the respondents, implying that marketing of sorghum is a profitable venture in the study area. The welfare of sorghum marketers was fully derived from the sorghum marketing business they transact, suggesting that sorghum marketing serves as a source of livelihood for the respondents. The study indicated that marketing agents are the main persons that purchase the products of the respondents and have great influence in the sorghum market in the study area. Majority of the respondents make their sales predominantly in the market for effective marketing of their products. Also, high expenditure incurred by the marketers especially due to poor roads, high or multiple taxes during transportation increase the market costs which seriously reduce the market margin.

For more active participation of the marketers in marketing of sorghum and effective performance in marketing of sorghum there should be the establishment of financial institutions geared toward aiding the marketers financially. This should be urgently done to help new entrants and expansion of the existing sorghum markets by the marketers. This has become imperative because money lenders and informal credit institutions have not been able to meet the demand of the sub-sector in financial assistance.

Rehabilitations and construction of access and feeder roads within the study area should be given appropriate attention in order to ease transportation problems and its attendant cost. There should also be the erection of market stalls, stores, and reduction in market taxes, so as to improve the marketing of sorghum in the study area. Adequate and improved storage facilities should be put in place so that sorghum can be stored until when there is enough demand for it to be completely sold out. Sorghum can also be preserved and conserved in order to meet up future demand. Provision of adequate storage and food preservation facilities would help to reduce the exploitative activities of the middlemen against the respondents.

There should be provision of adequate security by the government to reduce the effect of theft as a marketing problem, especially within the marketing square as complained by the respondents. There should be a well organised central market in the study area. This will motivate more customers or buyers and processing industries to buy directly from the farmers and this will generate more revenues for both individual farmers and government and further help reduce the exploitative activities of the middlemen against the respondents. Marketing agencies should be co-opted by government to take care of the marketing problems that are associated with the speculative activities of the middlemen. Marketers should form agricultural marketing cooperatives in order to eliminate the exploitative activities of the middlemen in the entire marketing system.

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**Table 1: Percentage Distribution of the Respondents by Socio-economic Characteristics**

Variable	Frequency	Percentage
<b>Sex</b>		
Male	77	77
Female	23	23
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Age</b>		
20<30	32	32
30<40	42	42
40<50	24	24
≥50	2	2
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Educational level</b>		
Primary	37	37
Secondary	54	54
Tertiary	2	2
No education	7	7
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 2: Percentage Distribution of Respondents by Structure of Sorghum Marketing in the Study Area**

Variable	Frequency	Percentage
<b>i. Membership of marketing association</b>		
Yes	93	93
No	7	7
<b>Total</b>	<b>100</b>	<b>100</b>
<b>ii. Freedom of Entry and Exit</b>		
Yes	91	91
No	9	9
<b>Total</b>	<b>100</b>	<b>100</b>
<b>iii. Free flow of price information</b>		
Yes	89	89
No	11	11
<b>Total</b>	<b>100</b>	<b>100</b>
<b>iv. Price Fixing</b>		
Bargaining	70	70
Quantity traded	12	12
Current price	15	15
Group decision	3	3
<b>Total</b>	<b>100</b>	<b>100</b>
<b>v. Sourcing of Marketing Information</b>		
Middlemen	80	80
Marketers association or union	15	15
Media	5	5
<b>Total</b>	<b>100</b>	<b>100</b>
<b>vi. Varieties of Sorghum Marketed</b>		
White sorghum	90	90
Red sorghum	10	10
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 3: Marketing Margin of an Average Sorghum Marketer**

Variable	Value (in Naira)
Farm price	2,000
Retail price	3,050
<b>Marketing margin</b>	<b>34.43%</b>

Source: Field Survey, 2011



**Table 4: T-test of no Significant Difference between the Retail Price and Farm Price of Sorghum among the Respondents**

	<b>Retail price</b>	<b>Farm price</b>
Mean	3050	2000
Variance	2525.252525	23349.49495
Observations	100	100
Hypothesized mean	0	
Degree of freedom	198	
t-statistic	65.2756551	
p-value (one tail)	3.614E-136	
t critical one tail	1.652585784	
p-value (two tail)	7.2281E-136	
t critical two tail	1.972017432	

Source: Field Survey, 2011

**Table 5: Percentage Distribution of Respondents by Social Benefits of Sorghum Marketing**

<b>Benefits</b>	<b>Frequency</b>	<b>Percentage</b>
Training children in school (a)	26	26
Building modern houses (b)	6	6
Buying cars	3	3
Employment	14	14
Combination of (a) and (b)	51	51
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 6: Percentage Distribution of Respondents by Channel of Distribution of Sorghum**

<b>Source</b>	<b>Frequency</b>	<b>Percentage</b>
Farmers	76	76
Local marketers	21	21
Middlemen	3	3
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 7: Percentage Distribution of Respondents by Channel of Sales of Sorghum**

<b>Sales</b>	<b>Frequency</b>	<b>Percentage</b>
Marketing agents	70	70
Retailers	8	8
Individuals	2	2
Wholesalers	20	20
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 8: Percentage Distribution of Respondents by Place of Sales**

<b>Place</b>	<b>Frequency</b>	<b>Percentage</b>
Market	65	65
Road side	20	20
Farm	10	10
Hawking	5	5
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011

**Table 9: Percentage Distribution of Respondent by Problems of Sorghum Marketing**

<b>Problems</b>	<b>Frequency</b>	<b>Percentage</b>
High taxes during transportation	48	48
Poor rural roads	25	25
Lack of central market	17	17
Robbery	3	3
Other (pests)	2	2
Accident	5	5
<b>Total</b>	<b>100</b>	<b>100</b>

Source: Field Survey, 2011