

POST-HARVEST LOSSES IN CASSAVA VALUE CHAIN IN EKITI- IMPLICATIONS ON SMALL SCALE FARMERS PRODUCTION AND INCOME

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Abstract

The study was carried out to assess the post -harvest losses in cassava value chain. A multi stage random sampling technique was used to select 160 respondents for the study while a structured interview schedule was used for data collection. Frequency counts, percentages and mean were used in data analysis. The study revealed that more male than female farmers were involved in cassava production in the area. Youths participated actively in the production and value chain of cassava. Most of the respondents were literate. The study shows that most of the cassava producers in Ekiti state were small scale farmers, with 66.9% having less than two hectares of cassava farm. A good proportion of the farmers (..) that process cassava before sales show some form of value addition. Losses were witnessed at various stages of post -harvest management. The stages involved harvesting, transportation, processing (grinding and frying) and storage with 7.54 to 5.49, to 5.23-4.95 3.78 to 3.26 to 2.57-2.17 percentages losses respectively.

In terms of revenue losses, the mean estimate loss ranges from N3709.68 to N2701.08 – N2573.16 -N2435.4 (in crop harvesting) to N1859.76 -N 1161.12 (storage losses) and N1067.64 (transportation losses) per annum. Hence, post-harvest losses reduce farmer's income and standard of living. The study recommends the construction of feeder roads to lessen the burden of transportation. The farmers can come together to form cooperatives for purchase of modern processing machines. There is the need to design packaging bags for the sales of cassava products to improve market access and points of sales at supermarkets. Training programs should be organized for farmers on value addition

Keywords: Cassava Value addition, Post-harvest losses, Small Scale farmers, Value chain,

Introduction

The issue of hunger and food insecurity is a major concern in the world. Millions of people in the developing world are reported to be hungry and did not possess the ability to eat good food at least two times per day. Recently, one of the main global challenges is how to ensure food security for a world growing population whilst ensuring long-term sustainable development. According to the FAO, food production will need to grow by 70% to feed world population which will reach 9 billion by 2050. Thus, there is a need to embrace an innovative measure that would ensure sustainable food production (World Wildlife Fund, WWF, 2014). According to CIA World Factbook (2013), cassava is one of the crops that have the potential to ensure sustainable growth and development in the agricultural sector. The world production of cassava root was estimated to be 184 million tons in 2002 (Thai Farm International, TFI, 2014). The majority of production is in Africa where 99.1 million tones were grown, 51.5 million tons were grown in Asia and 33.2 million tones in Latin America and the Caribbean (FAO, 2005). The Food and Agriculture Organization of the United Nations (FAO) in Rome

(FAO, 2004) estimated 2002 cassava production in Nigeria to be approximately 34 million tonnes. According to IITA (2009), More than 228 million tons of cassavas were produced worldwide in 2007, of which Africa accounted for 52%. In 2007, Nigeria produced 46 million tons, making it the world's largest producer. Cassava is grown in all the ecological zones in Nigeria. It could be regarded as the most important root crop in terms of area cultivated and total production (FAO, 2009). The crop is planted all year round, depending on the availability of moisture. It is a very important staple food consumed in different forms by millions of Nigerians. Cassava roots are rich in energy, containing mainly starch and soluble carbohydrates, but are poor in protein. Cassava is a crop of the poor. It is eaten boiled, cooked and pounded into "fufu, processed into "garri, "lafun" (cassava flour), among others. Traditionally, most cassava consumed in Nigeria is in the form of garri, fermented and dehydrated flour with high starch content. Cassava can also be processed for alcohol; 170 liters of alcohol can be derived from each ton of cassava (compared with 200 kilograms of garri) (Coombs and Vlitos, 1978). Cassava chips and pellets are used

by the animal feed industry as a substitute for some of the grains in feed rations. Cassava flour is also exportable and used in the manufacture of livestock feed. Cassava starch has a number of industrial applications. These and other features endowed it with a special capacity to bridge the gap in food security, poverty alleviation and environmental protection (Clair *et al*, 2000).

Cassava in Nigeria is generally believed to be cultivated by small scale farmers with low resources (Ezebuio *et al*, 2008). It also plays a major role in the effort to alleviate the food crisis in Africa. The Fact fish statistics (Fact fish, 2015) estimated cassava production in Nigeria as at 2013 was 53.00 million metric tons.

The four most important reasons motivating the production of cassava among farmers are food security, extra income, and tradition and as industrial raw materials (Benue State Agricultural and Rural Development Authority, BNARDA, 1997).

Statement of the Problem

Despite the interventions in cassava production in Nigeria, most of the people are still hungry and living in abject poverty. One begins to wonder why this is so and how cassava as a crop could be used to improve the food security status of the people living in Ekiti state

Though farmers in Nigeria and Ekiti state in particular witness a lot of post-harvest losses in the cassava value chain, there are limited data on post-harvest losses in cassava production, most especially with respect to Cassava value chain in the state. Some of the questions that the study attempted to address on post-harvest losses in cassava value chain are:

1. What are the various stages involved in cassava post-harvest management?
2. Do cassava producers actually encounter any loss at these stages?
3. If yes, what are the various losses encountered at the different stages of cassava post-harvest management?
4. Do post-harvest losses in cassava value chains have any impact on farmer's production and income?
5. If yes, how could the losses be minimized, if not totally eradicated?

Answers to these questions might proffer solutions to how post-harvest losses in cassava value chain can be reduced/ eliminated. It could also, add a sizable quantity to the global food supply, most especially in the cassava value chain.

The broad objective of the study is to analyze the post-harvest losses in cassava value chain in Ekiti state.

The specific objectives include:

1. To ascertain the socio-economic characteristics of cassava producers in Ekiti state
2. To investigate if cassava producers encounter any loss in the value chain
3. To determine the magnitude of losses at each stage of cassava value chain
4. To estimate the impact of the post-harvest losses on the farmers production and income
5. To determine how the losses can be minimized/ eradicated

Methodology

A multi- stage sampling technique was utilized to select the respondents for the study. The first stage involved the random selection of eight out of 16 local government areas in Ekiti State, Nigeria. The second stage involved a random selection of 2 communities from each of the local government areas selected. The third stage involved a random selection of 10 farmers that produce cassava from each community. Thus, a total of 160 respondents were sampled for the study.

The information gathered was analyzed using descriptive analytical tools such as frequency counts, percentages and means.

Results and Discussion

Socioeconomic Characteristics of Cassava Producers

Data in Table 1 shows the gender distribution of the respondents. Males constitute 62.5% of the total respondents, while 37.6% were females. Also, 41.3% of the respondents were below 30 years of age, 14.4% between 30 and 40 years, 25.6% between 40 and 50 years, 8.8% between 50 and -60 years, 7.5% between 60 and 70 years, while 2.5% were above 70 years This implies that more male gender in the cassava production than female in the study area. This confirms the findings of Butterworth (2008) that both men and women in Nigeria are involved in the production, processing and marketing of cassava, although men's emphasis is more on production and women's on processing. With the high percentage of respondents being older than 30 years, it is implied that a lot of youths participate actively in the cassava value chain in the study area. The high percentage of involvement of youth in cassava value chain might be due to the characteristics possessed by the crop - cassava. According to Institute (2010), cassava possesses the following characteristics: Cassava can be grown in poor soils and is drought tolerant, it can

be intercropped with other crops and inputs are rarely used. It can be stored in the ground for many months, and it is highly commercialized in parts of West Africa. After being dried, chipped, or converted to gari (toasted cassava flour), Fufu or Lafun, it has a longer shelf life, allowing for longer-distance marketing. All these characteristics might motivate youths to be involved in cassava production

The educational qualification of producers indicates that 18.1% of them had no formal education, 13.1% had primary school education, 33.1% had up to sec. school education, and 33.1% had tertiary education, while 8.1% had non-formal education. It shows that most of the respondents were literate. High literacy level is expected to have positive effect on value addition to cassava. A younger generation can help introduce new technologies and at the same time learn from traditional methods, thus, holding the

potential to offer the perfect fusion of new and traditional solutions to value addition].

Half (50%) of the respondents had less than 1 hectare of cassava farm land, 16.9% had between 1-2 hectares, 31.3% had between 2-3 hectares, and 1.9% had greater than 3 hectares of cassava farm land. The study shows that most of the cassava producers in Ekiti state were small scale farmers. According to Ozowa (1995), Nigerian farms are classified into small scale, medium scale and large scale. When judged by international standards whereby all farms less than 10.00 hectares are classified as small, then 94.37 percent of all farm holdings in Nigeria (or 28 million holdings) must be classified as small scale farms. Also, Adebo, Ayodele., Olowokere, (2015) asserted that small scale farmers dominate most of the agricultural enterprises in Nigeria and in particular the palm oil industry.

Table 1: Socio economic characteristics of cassava producers in Ekiti state

Variable	Frequency	Percentages
Age		
<30 years	66	41.3
31-40	23	14.4
41-50	41	25.5
51-60	14	8.8
>60 years	16	10.0
Gender		
Male	100	62.5
Female	60	37.5
Marital status		
Single	45	28.1
Married	100	62.5
Widowed	15	9.4
Educational status		
No formal Education	29	18.1
Primary Education	21	13.1
Secondary Education	53	33.1
Tertiary Education	44	27.5
Non-formal education	13	8.2
Farm size		
< 1hectare	80	50.0
1-2 ha	27	16.9
2.1 -3ha	50	31.2
> 3 ha	3	1.9

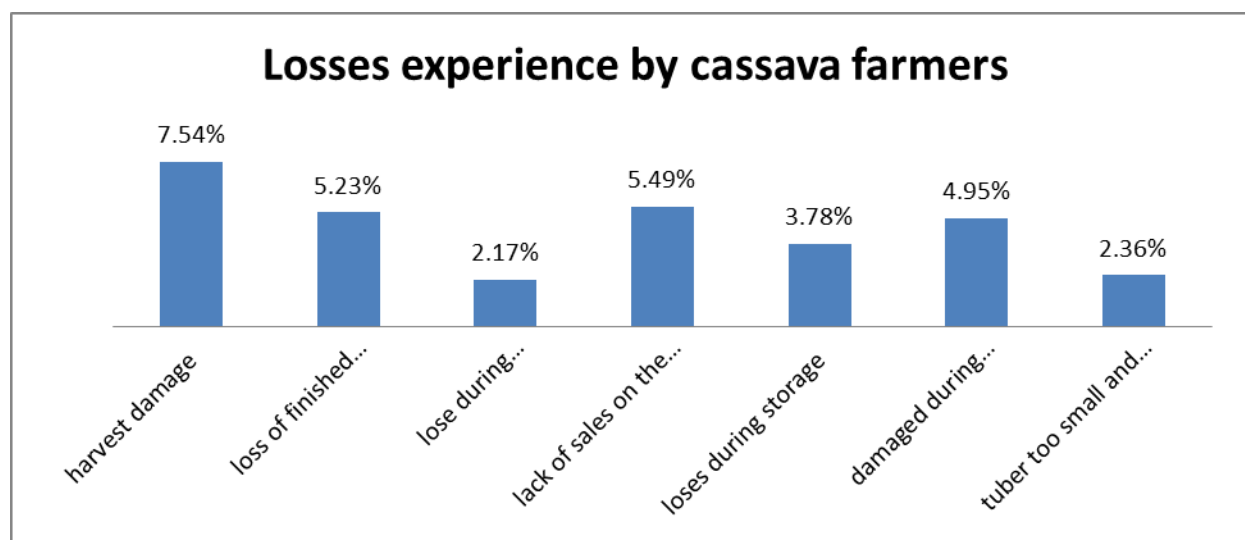
Post-Harvest Losses at each stage of Cassava Value Chain

Data in Table 2 shows that losses are recorded at the various stages of post -harvest management of cassava. The stages involved harvesting, transportation, processing- grinding and frying and storage.

Percentage losses vary at each stage. It ranges from 7.54 to 5.49, to 5.23-4.95 3.78 to 3.26 to 2.57- 2.17 percentages. The losses witnessed might be due to lack of feeder roads in Ekiti state. Although, most of the roads leading the towns and villages in Ekiti state are motor able, however, farmers trek long distances from their farms to link the major roads. It is worth noting that most agricultural production activities in Ekiti state are carried out manually.

Losses as a result of poor sales usually results from products not been sold on the day of harvest. It is believed that the value of cassava depreciates if not peeled the same day of harvest. Hence, it commands lower prices in the market and lead to loss of revenue to the farmers. Cassava products such as Garri and Fufu losses during storage might be due to the lack of processing facilities. Most of the finished

products are stored in either nylon or jute bags. It could also result from the presence of rodents in the house. Some of the bags are easily destroyed by rodents. Also, most of the farmers in Ekiti state are still using grinders that could make the product prone the products to either falling on the ground or loss during grinding



Impact of the Post-Harvest Losses on the Farmers Production and Income

The impact of post-harvest loss in cassava production on farmer's income was shown in Table 3. The estimated total annual losses at various levels in the value chain were stated. Using the mean of the yield of cassava on a normal weather, and the current market value of cassava of ₦6,000.00/ ton in Ekiti state, the percentage loss as a result of crop damage during harvest was estimated at 7.5%. This amounts to ₦3,709.68 per annum. Following the same process, the percentage loss during transportation is 2.17, the money value is ₦1,607.64 per annum, and Losses as a result of lack of sales on the harvest day was estimated at 5.49% or 2,701.08. Losses during storage were 3.78% (₦1,859.76) per annum. Losses during processing (lafun, fufu and garri) were estimated at 4.95% (₦, 2435.4) per annum.

Losses as a result of too small and discarded tubers was estimated at 2.36% (₦1,161.12) per annum. In essence, if the losses were added together, in a year, under a normal yield, a farmer would be losing

about ₦12,934.68. The loss is equivalent to 26.29%. The finding is in agreement with the Oguntade and German Federal Ministry for Economic Cooperation and Development (2013) report that established the overall post-harvest loss status of major crops in Africa. The findings show that the percentage loss in cassava post-harvest was 28 percent. It also shows that the percentage loss for cassava in other countries such as Malawi (10-30%) and Tanzania (19-63%). The losses are a pointer to the necessity to consider taking the issue of post-harvest management seriously. Decisive steps are required to reduce, if not totally eliminate the losses in order to ensure food security. For instance the grinding floor of the above processor is littered with cassava that has been grinded. There is the need to use improved grinder to reduce farmers' losses. Some cassava tubers that are too small to be peeled are usually discarded by the farmers. This also constitutes another source of loss which results from the varieties planted. At times, overuse of land might result into low yield. Farmers could plant improved varieties to avoid this kind of loss.

Table 3: Impact of the Post-Harvest Losses on the Farmers Production and Income

loss of cassava farmers	(% loss)	Annual production (ton/hectare)	Quantity loss/annum	price/tonne	Annual income/annum (N)	Annual loss (N)
harvest damage	7.54%	8	0.61828	6000	49200	3709.68
lose during transportation	2.17%	8	0.17794	6000	49200	1067.64
lack of sales on the day harvested	5.49%	8	0.45018	6000	49200	2701.08
losses during storage	3.78%	8	0.30996	6000	49200	1859.76
Losses during processing	4.95%	8	0.4059	6000	49200	2435.4
tuber too small and discarded	2.36%	8	0.19352	6000	49200	1161.12

Summary

The study was carried out to assess the post -harvest losses in cassava value chain. A multi stage random sampling technique was used to select 160 respondents utilized for the study while a structured interview schedule was used for data collection. Frequency counts and percentages and mean were used in data analysis.

The study revealed that there are more male than female gender in the cassava production in the study area. A lot of youths participate actively in the cassava production and in the cassava value chain in the study area. Most of the respondents are literates. All the respondents produced cassava however they also grow other crops such as maize, in some areas, rice and yam. The variety commonly grown is Odongbo. The study shows that most of the cassava producers in Ekiti state are small scale farmers. A good proportion of the farmers' that process cassava before sales show some form of value addition.

Losses are witnessed at the various stages of post -harvest management. The stages involved harvesting, transportation, processing- grinding and frying and storage. Percentage losses vary at each stage. It ranges from 7.54 to 5.49, to 5.23-4.95 3.78 to 3.26 to 2.57- 2.17 percentages.

In terms of revenue losses, the mean estimate loss ranges from N3709.68 to N2701.08 – N2573.16 - N2435.4 to N1859.76 to N 1161.12 and N1067.64 Post-harvest losses reduce farmer's income and standard of living

Recommendations

Based on the findings of this study, the following recommendations were made:

- Feeder roads should be constructed to reduce loss due to transportation
- Improved processing machines should be introduced to farmers in Ekiti state
- The farmers can come together and form cooperatives to purchase modern processing machines
- There is the need to design storage materials that could not be easily destroyed by rodents for storing farm products
- There is the need to design packaging bags for the sales of cassava products to improve market access and points of sales at supermarkets
- Storage facilities should be constructed
- Farmers should be encouraged to process their cassava rather than uprooting and selling at the market
- Training programs should be organized for farmers on value addition

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