THE METHODS OF STORAGE OF FARM PRODUCE BY FARMERS IN NIGER STATE OF NIGERIA

BY

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Abstract

This study is aimed at determining the methods of storage of farm produce by farmers in two selected Local Government Areas of Niger State namely Paikoro and Bosso. Data was collected from 62 stratified randomly selected farmers, using structured questionnaires. Data were analyzed using descriptive Statistics. The result of the study shows that the farmers in the study area make use of various techniques in storing the farm produce as an insurance against spoilage. The major methods of storage common in the area include Granaries/Rhumbu, Jute bags, barns and plastic bags. Sophisticated Technologies of farm storage like modern silos and refrigerators were uncommon due to poor investment of facilities by farmers in the area. Formation of cooperatives by the farmers to benefits from collective effort. Also subsidies in form of lower imput costs should be extended to the farmers to ensure food security, self-sufficiency and self reliance.

Introduction

One of the major problems facing developing economies, of which Nigeria is one, is of food security, fuel and shelter for their large and ever-increasing population (Ndanitsa, 2005). Similarly, the greatest of these challenges is in the rural areas, where employment and supplies are not so richly available as in the towns (Akinsanmi, 1975). A great number of Nigerians are involved in the sales and distribution of agricultural products. The sector is also a source of raw materials for several agro allied industries which also help to extend their uses through value-addition (Ndanitsa and Umar, 2006).

Agricultural products are also a major source of domestic and international trade which provides revenue for the government and people of a country. Increased agricultural productivity enable farmers to increase their incomes, investment, improve their standard of living and reduce poverty, as more funds become available for development projects like education, health, manufacturing, roads construction/rehabilitation, and communication. One of the methods of increasing world's food security is not by increased production per hectare alone but by reducing losses through spoilage. It has been estimated that if losses in Stored grains were eliminated; there would be sufficient food to supply the carbohydrate needs of about 250 million people each year (Dobrovsky, 1959).

According to Youdewei etal, (1986) "Storage of farm produce is of great importance in agricultural production and consumption. Efficient storage ensures that market demands can be met throughout that year and can increase profitability of a farming enterprise. If a product deteriorates in storages, its nutritive and economic value may be decrease." When crops are produced within a growing season and cannot be consumed at a time, the need for storage arises and when these products as a result of spoilage. Anyanwu etal (1982) stated that vegetable products and crops cannot be stored for long under the hot and humid conditions, this limits production greatly.

Food they said is cheap at a certain period of the year but expensive at other times. The period of plenty is usually the harvest period and becomes scarce as the next harvest is approached (Fokorede, 1977). Some of the problems that inherent are as follows:

1. Crops such as fruit, tomatoes and vegetables are produced in large quantities in some areas and the farmers in trying to sell all before it starts deteriorating, are forced to sell at a loss thereby increasing their cost of production with a huge loss.

2. Farmers are seen traveling to father states and neighboring countries in a bid to dispose their products and in the process a lot of them are overcome by losses due to accidents on the way, weather vagaries, mechanical conditions (i.e. vehicles getting spoilt and products starts loosing its value), Robbery incidence, etc.

3. From experience, in areas where vegetables and fruits crops go into waste because of inadequate storage facilities, these produce are either thrown away or sold in salvage value-" sell it or smell it' syndrome.

4. During the planting season, when farm produce (like yam) begins to be scarce from the market, prices go up due to shortfall in supply of products. Life becomes unbearable for the farmer, but this can be averted if the farmer can store his produce for the rainy days, which can still create a surplus in the market, thereby making it available and also at an affordable rate.

5. The effect of natural disasters such as erosion, fire and weather conditions that affect some crops that are harvested without good and efficient storage facilities leading to waste and spoilage.

Problem statement and objectives

This study therefore, intends to examine the methods of farm produce storage by farmers in Niger state, and to achieve this, the following research questions emanated: (i) what types of storage facilities exist in the study area? (ii) Do farmers in the study area actually store their farm produce before marketing them? (iii) Why do the farmers store their farm produce? (iv) Does storage of farm produce actually add value to end users? This study is therefore an attempt to provide answers to these and related questions using Paikoro and Bosso L.G.A of Niger State as a case study. The specific objectives of the study are to:

(i) Highlight the socio-economic characteristics of the farmers;
(ii) Determine the type of farm produce usually stored by the farmers;
(iii) Determine the cost implication of storage of farm produce;
(iv) Identify the type of storage facilities existing in the area; and
(v) Find out the problems being faced by farmers in the storage of farm produce.

This study has become imperative in that food security of a nation is better guaranteed through increased production with subsequent effort at providing efficient storage facilities in order to preserve produce for a longer use, it minimizes wastes, it helps the consumers by soaring the quantity of food stuff in the market thereby stabilizing their prices, and assist farmers by giving them the needed confidence even at the time when they are not financially liquid/solvent as they are fetch from the store to raise capital or consume from it.

Literature review and conceptual framework:

According to Mijinyawa (2002), crop storage is a container that is designed and fabricated to perform the function of safety keeping of crops, and that the structure should be capable of retaining the quality and quantity of the crop for as long as it is stored. The author further submitted that the storage structure should eliminate the destructive effect of weathering, invasion by pests and insects activities of micro-organisms and enzymes, loss of structure through dehydration (wilting and shriveling); germination of seeds or sprouting of tubers while in storage, loss of vitality, provide adequate security against pilferage and of storage capacity enough to accommodate the amount of produce to be stored. The researcher

further gave example of these storage structures to include warehouse, silos, evaporative cooler, rhumbu, platform, crib, earthen pots and gourds, baskets, heaps for tubers (like yams) drum and kerosene tin, plastic bags, hanging, underground storage, medium-scale storage, cold storage, etc.

However, Anonymous. (2000) submitted that grains need to be properly dried before storage since heating up is a major problem. F.A.O. (2000) also submitted that plastic bags are used mainly to store seeds, cereals, pulses, groundnuts, and cowpea which has a storage time of 6-9 months with 50-100 liters capacities, and that the cost is fairly high when good quality bags like fertilizer bags are used. Also Agisegeri and Osunde, (1992) reported that bags are considered a transit storage container but if properly improved could serve as long term device, but the cost will be too exorbitant. More often than not, Deblois (2000) submitted that cold storage facilities are the next best thing to fresh-picked produce such as fruits, vegetables, meat and fish are the common products stored in this way, their flavour and nutritional value remain very high, and they also keep for an amazingly longer period, does not require much preparation before storing, saves a lot of time and energy, increase the shelf life of produce, lengthens the time span which foods can be processed for preserving other methods. The researcher further added that fruits and vegetables can be easily moved from one point to the other.

Methodology:

The Study Area.

The study was conducted in Niger state. The state was curved out of the former North-western state in 19976, and is between latilu8des 8°20' N and 11°30' N and between longitude 3°30' N and 7°20E. The state is bordered to the north by Sokoto state, west by Kebbi state, south by Kogi state and south-west by Kwara state, Kaduna and Federal Capital Territory border the state both to the north-east and south-east respectively. The state is constitutionally administrated under 25 local government areas (L.G.A) but this research was conducted in Bosso L.G.A and Paikoro L.G.A respectively. Bosso L.G.A is located in Minna the capital of Niger state, while Paikoro L.G.A is located about 22km North of Minna. The state has moderate climate with daily air temperature varying from 23°C 37°C. Annual rainfall varies from 1,100mm in the North to 1,600mm in the South. The state is linked to other parts of the country by roads, rail and air-port and is identified with predominantly the Nupes, Gbagys and Hausas. Other tribes like Ibo, Yoruba, Kadara, Dibbo, Igala, and Kambari are in minority.

Fertile agricultural lands are by far the state's richest resources. Crops grown in sugarcane, sweet potato, egg plant, cassava and green vegetables.

Sampling Procedure and Data Collection

The data for the study was obtained from combination of primary and secondary sources, but mainly thorough the former. The primary data was obtained from a cross-sectional survey of the farmers directly involved in farm produce storage activities with the aid of an interview schedule.

In order to get a representative sample and to achieve the stated objective of the study, 50 respondent were selected from each of the two L.G.A's. the respondents include all farmers that make use of any means of facility (ies) for storage of using the stratified random sampling method. Data was collected from the selected farmers for the 2006/2007 farming season by the researcher assisted by trained enumerators.

Data Analysis

All the objectives of the study were achieved through descriptive statistics such as frequency distribution, means, cumulative frequency distribution, tabulations, etc.

Result and Discussion.

Table 1: Socio-economic characteristics of the farmers.

Age Distribution

Characteristics Age range	Frequency	Percentage
20-30	23	37.10
31-40	10	30.70
41-50	11	17.20
51 and above	09	14.50
Total	65	100.00

Mean Age Value = 36 years

Modal Age group = 20-30 years

Marital Status

Characteristics	Frequency	Percentage
Single	17	27.40
Married	45	72.60
Total	62	100.00

Farming Experience

Years of farming	Frequency	Percentage
1-5 years	10	16.10
6-10 years	13	20.90
11-15 years	17	27.40
Above 15 years	22	35.05
Total	62	100.00

Farm Size

Farm size	Frequency	Percentage
0-1	20	32.30
6-10	40	64.50
Above 10	2	3.20
Total	62	100.00

Educational status

Level of Education	Frequency	Percentage
None	25	40.30
Quranic education	15	24.20
Primary	13	20.90
Post-primary	5	8.10
Post-secondary	4	6.50
Total	62	**100.00**

Source: Field Survey, 2007.

Table 1 show the age distribution of respondents. Age is the length of past life or existence of a person. The table revealed that the largest population of farmers surveyed was between the age brackets of 20-30 years (i.e. 37.10%). A few of then are above 50 years of age (14.5%). This means that most of the farmers are still within the active labour force in terms of farming and adoption of annotation. The finding corroborated with that of Worogi (2000) who revealed that most farmers in Gbako L.G.A are within the active labour force (of age brackets 30-39 years). Table 1 also revealed the rainfall status of the respondents in the area. Marital status may become an important factors in agricultural production especially when farm labour supply is limited. Married couple with large family size may have large supply of labour tó work on the farm and this may increase the size of farm Qu'ranic education, while 35.5 percent of the respondents had formal education from this result, it can be deduced that the level of acceptance of innovations among small-scale farmers would be low due to low standard of education.

Farm size (in ha) cultivated by the respondents is also revealed in table 1. Most of the respondents (64.5%) had their farm holding ranging from 0.5 ha. This finding agrees with the finding of Olatubosun (1975), that typical small-scale farmers in Nigeria had a farm size ranging from 1-5, and 10 ha often is scattered small holdings. Farm size is very important as it means that the larger the farm size with the use of improved varieties of crops and other necessary factors that determines improved yield means higher crop output, hence the need for storage of such farm produce. The size of the farm can also determine what type of storage facilities to be used by the farmer.

Table 2: Type of Crops Cultivated

Types of crops	Absolute frequency	Relative frequency percentage
Yams	49	15.90
Maize	55	17.90
Cassava	42	13.60
Groundnut	28	9.10
Millet	16	7.50
Sweet potato	9	5.20
Tomatoes	6	2.90
Rice	27	8.80
Pepper	4	1.30
Cocoa yam	7	2.30
Ben seed	2	0.70
Melon	9	2.90
Beans	23	7.50
Soya beans	6	1.90
Cowpea	2	0.70
Total	308	100.00

Source: Field survey, 2007

Table 2 reveals that a variety of food crops are grown by farmers in the study area. The maize crop having the highest percentage frequency of 11.9% is the most widely cultivated crop in the area, followed by the yam (15.9%) and cassava representing 13.6% other grown are groundnut, rice, guinea corn, beans and millet. The result also revealed that through the people who are predominantly Gwaris cultivate a lot of tuber crops such as yam, it also show that they are chief growers of grain crops.

Table 3: farmers embarking on storage of farm produce

Response	Frequency	Percentage
Yes	57	91.90
No	5	·8.10
Total	62	100.00

Source: field survey, 2007.

Storage of farm produce by respondents in the study area is revealed in table 3. it shows that about 92% of the farmers are engaged in the storage of farm produce after harvest in various methods. Those farmers said they engaged in storage of farm produce for various reasons. Some of the reasons they gave were:-

(i) Storing seed for next planting season and future use
(ii) Storing in anticipation od rise in prices of farm produce
(iii) Storing to ensure availability of farm produce throughout the year.
(iv) Storing for the purpose of using produce as security for loans and in times of need.
(v) Storing for consumption, etc.

Various methods are adopted by farmers in storing their farm produce. Those adopted by the farmers in the study area is revealed in table 4. Result from the table revealed that farmers in the study area store their farm produce in granary / rhumbu (19.2%) making it the most popular method. This is followed by the barn method of storage (17.30%) given the high rate of yam production in the area. The result further shows that storage by means of refrigeration's, can tanks, leaves, po ts, drums and gourd are uncommon in the area. This is in agreement with Bamiro and Ditto (1986) that most of the methods as seen in table 4 are traditional and obsolete.

Table 4: Methods of storage of Farm Produce.

Methods	Absolute	Relative Frequency Percentage
Barns	38	17.30
Granaries/Rhumbu	42	19.20
Underground	19	8.70
Field	11	5.00
Crib	13	5.90
Silo	0	0.00
Plant Form	12	5.50
Hanging on roof	22	10.00
Tying of stakes	13	5.90
Can storage	0	0.00
Storage tank	0	0.00
Jute bags	20	9.10
Plastic bags	29	13.20
Leaves	0	0.00
Pots, Drum and Gourds	0	0.00
Total	219	100.00

Source: Field survey, 2007.

However, among the farmers that store their farm produce, 67.70% of the farmers said the methods are inadequate and inefficient. This is revealed in table 5. Similarly, the

Table 5: Adequacy of Storage Method

Response	Frequency	Relative Frequency Percentage
Adequate	20	32.30
Inadequate	42	67.70
Total	62	100.00

Source: field survey, 2007.

Farmers store their farm products for period ranging from 1-3 years. Table 6 revealed that since the most commonly used method of storage structure do not last more than a year or two, the period of storage is also limited. 61.3% of the respondents store their farm produce under one year, followed by 33.9% and 4.8% who store their farm produce between one to two years and two-three years respectively. More so, the survey revealed that the length of storage is a function of the type of produce, the purpose for which it is kept and the construction of a particular structure for the produce.

Table 6: Length of Storage

Response	Frequency	Relative frequency Percentage
Less than a year	38	61.30
1 2 years	21	33.90
2 3 years	3	4.80
Total	62	100.00

Source: Field survey, 2007.

The result from table 7 revealed that few of the crops earlier mentioned in table 2 are usually stored by the farmers after harvest. It is evident in table 7 that maize having the highest percentage frequency of 24.2%, followed by yams (17.6%) from the majority of the crops stored in the area. Other crops like Guinea corn, Rice, Groundnut and Beans are usually stored in the study area too. The result is in agreement with Baffour (1981), who stated that yam tubers may be stored by arranging them singly on wooden platforms in cool dry well ventilated rooms, while maize may be stored in silos, jute bags. Adeleye (1986), also submitted that produce such as Beans, Rice, Corn, Groundnut etc. can be store in jute bags for short periods.

Table 7: Types of Farm Produce usually stored.

Produce Percentage	Absolute Frequency	Relative Frequency
Yams	40	17.60
Maize	55	24.20
Cassava	7	3.10
Groundnut	28	12.30
Guinea corn	23	10.10
Millet	· 16	7.10
Sweet potatoes	9	4.00
Melon	2	0.90
Cocoyam	1	0.40
Rice	27	11.90
Cowpea	1	0.40
Beans	18	7.90
Total	227	100.00

Source: Field survey, 2007.

Farmers in the study area encountered a number of problems in the course of storing their farm produce. Table 8 reveals that prominent among them is the incidence of pests (including mammals) which ranked first. This is then followed by fire outbreaks (23.8%), diseases (14.6%), rain (11.9%) and theft (13.9%). This development often forced the farmers to acquire pesticides for spraying during storage as is revealed in table 9. About 63% of the farmers use chemical pesticides to safeguard their produce in the store.

Table 8: Problems of Storage of Farm Produce.

Response	Absolute Frequency	Relative Frequency Percentage	Ranking
Pests	54	35.80	1
Diseases	22	14.60	3
Theft	21	13.90	4
Rain	18	11.90	5
Fire outbreaks	36	23.80	2
Total	151	100.00	

Source: Field survey, 2007.

Table 9: Use of Pesticides in Storage of Produce.

Response	Absolute Frequency	Relative Frequency Percentage
Yes	39	62.90
No	23	37.10
Total	62	100.00

Source: Field survey, 2007.

Conclusion and recommendations

The study examined the methods of storage of Farm Produce by Farmers in Niger State of Nigeria. Paikoro L.G.A and Bosso L.G.A were selected for the study. It was evident that most of the farmers in these areas were involved in the production and storage of farm produce. Among the crops cultivated and stored in the area include Maize, Yam, Guinea corn, Groundnut, Cowpea, etc. storage facilities found in the study area include Barns, Granaries/Rhumbu, Underground, Crib, Plant form among others. The study also revealed that the period of storage varies depending on the produce, purpose and durability of the storage structure used. The structures of facilities were inadequate and inefficient as enumerated by the farmers in the area. Farmers often grabble with the problems of pests, diseases, theft, rain and fire outbreak in the course of storage of arm produce in the area. Most farmers had to resort to using pesticides to mange the menace of pests and diseases of stored products to safeguard their produce while in store.
Extension education on modern techniques of storage of farm produce should be extended to farmers. Also rural infrastructures such as electricity should be extended to farmers in the rural areas to enable them adopt innovations on storage techniques such as cold stores/refrigeration. This can achieve through Public-private partnership. In addition storage pesticides should be provided to these farmers at subsidized rates to enable them manage stored products pests and diseases. Farmers should be encouraged to form cooperatives to enable them acquire modern storage facilities by pulling their resources together.

With cooperation, farmers can also approach the financial institutions with the mandate to grant them soft loans with less bureaucracy. If these recommendations are addressed adequately, then much needed food security in the area will be realized and the economy becomes self-reliance in food production and distribution.

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