



Analysis of adoption of cashew management techniques by cashew farmers in Zone B Agro-ecological zone of Kogi state

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Abstract

Cashew (*Anacardium occidentale*) is a crop of commerce of which both domestic and international demand has risen lately. It thrives well in the guinea savanna region of Nigeria particularly Kogi State that is known for producing quality cashew nuts. Hence, this study investigated the adoption of cashew farm management techniques by cashew farmers in Zone B agro-ecological zone of Kogi State. A total of 120 respondents were selected and administered questionnaire using a combination of both purposive and random sampling techniques. Data obtained were analyzed using descriptive statistics. Result showed that Majority (74.2%) of the respondent were married with average household size of 7 persons per household. The mean age of respondents was 49 years. The result also showed that pruning (98.3%) and fire tracing (97.5%) were the most adopted cashew farm management techniques by cashew farmers in the study area. The study recommended that farmers should be trained on good agricultural practices on cashew production to improve its management.

Keywords: Cashew, Adoption, Management Techniques, Farmers, Nuts

Introduction

Cashew (*Anacardium occidentale*) is native of Brazil (AgriFarming, 2019). It was introduced into Nigeria between 15th and 16th centuries by the Portuguese explorers and the crop has rapidly spread to all agro-ecologies of the country. Cashew is well adapted to seasonally wet and dry tropical climates and has the capacity to grow and yield satisfactorily on well-drained, light textured soils with minimum inputs. (Okon, 2016). Cashew was introduced for the purpose of afforestation and soil conservation. From its humble beginning as a crop intended to check soil erosion, cashew has emerged as a major foreign exchange earner next only to tea and coffee (AgriFarming, 2019). The introduction of

Brazilian cashew biotype with improved and desirable nuts and quality characteristics by the Cocoa Research Institute of Nigeria (CRIN) has further increased the popularity of the crop and the spread in Nigeria (Hammed et al., 2007).

Cashew crop constitutes a source of income, employment and raw materials for the producing nations. More than 65% of farm families who are smallholder farmers all depend on the crop as a source of income in Nigeria. Cashew is grown throughout Nigeria but the cultivation is centralized primarily in the south and middle belt regions in smallholder farms and plantations (Agada and Sule, 2020). The drought resistant, evergreen cashew tree is economically grown for its nut, apple and

wood. Products derived from the nuts include the world's highly delighted roasted kernel snacks, kernel oil, cashew nut shell liquid, and from the apple: juice, jam and alcohol among others.(Adeigbe et al.,2015).

Cashew (*Anacardium occidentale*) is a hardy crop that is well adaptive to diverse weather conditions. It is the most tolerant crops that can grow in both acidic and alkaline soil condition. Cashew tree yield is greatly dependent on the nature and kind of farm management techniques that was adopted by the farmer (Agbabiaka Abdulkadir, 2018). The adoption of the farm management techniques is very important, truly, a farmer planting the best variety does not guarantee the best yield. Increase in cashew production is usually as a result of the adoption of some farm management techniques and the integration of improved farming system (Warren, 2006). For a farmer to have the best yield the particular farmer need to understand the following farm management techniques which are: pruning, selective thinning, record taking, the space factors, weeding, etc. Cashew thrives well in most area of Zone B agro-ecological zone of Kogi State. Hence, all the above listed management techniques are expected of cashew farmers in Zone B to adopt and adhere to for the farmers to break even in cashew production. But unfortunately many of the farmers lack knowledge about many of these element and good agricultural management in general (Marianne Duijm, 2019). Farm management is socio-economic as well as a decision-making unit. It is a socio-economic unit because it provides income to the farmer and also it forms a source of livelihood to the family. It is a decision-making unit as it facilitates many alternative uses for the available resources in the form of different crops and livestock enterprises. (Subba *et al*, 2004).

The study is meant to answer the

following research questions.

What are the socio-economic characteristics of cashew farmers?

What are the types of cashew management techniques in the study area?

To what extent do cashew farmers adopt farm management technique?

What are the constraints faced by cashew farmers on farm management techniques in the study area?

The broad objective of this study is to analyze the adoption of cashew farm management techniques by cashew farmers in the study area.

The specific objectives were to:

1. Describe the socio-economic characteristics of the respondent in the study area.
2. Identify the types of cashew management techniques adopted by farmers in the study area
3. Examine the extent of adoption of cashew farm management techniques
4. Identify constraints faced in the adoption of cashew farm management techniques

Methodology

Study Area

The study was conducted in zone B agro-ecological zone of Kogi State, North-Central Nigeria. It is bounded on the North by River Niger on the West by Anambra and Enugu States on the South and Benue State on the East. The eastern senatorial zone consists of two Agro-ecological Zones. Zone D consists of Idah, Ofu, Ibaji, Igalamela/Odolu Local Government Areas, while Zone B consists of Ankpa, Omala, Dekina, and Bassa Local Government areas. The people are mostly Igalas and Bassas with farming, trading and fishing as their major occupations. Mixed farming is a widespread practice among farmers. The

major arable crops grown in the area are cassava, yams, maize, sorghum, millet, pigeon peas, bambara nuts, groundnuts and beans. The common perennial crops are oil palm, cashew, citrus and kola. The people also engaged in non-agricultural income-generating ventures like dress making, hair dressing, shoe making, civil service, knitting, money lending, interior and exterior decoration, phone charging, bead making, herbal business, soap making etc.

Sampling Procedure

The population comprises all Cashew farmers of zone B of Agro-ecological zone in Kogi State. A multi-stage sampling procedure was employed using primary data. Firstly, two extension blocks were purposively selected based on the concentration of cashew plantation. Secondly, three (3) extension cells were randomly selected from each block, making a total of 6 extension cells. The third stage involves random selection of 20 cashew farmers from each extension cell making a total of 120 respondents for the study

Data Collection and Analysis

Primary data was used for this study. The primary data was collected using structured questionnaire which was administered to cashew farmers in the study area.

Data was analyzed using descriptive such as frequency, percentages, and mean score from the Likert type of scale.

Objective I and II was achieved using descriptive statistics such frequency, percentages, mean and mode.

Objective III and IV was achieved using mean score from liker type of scale

Model Specification

Extent of Adoption of Cashew Farm Management Techniques was measured on

3-point Likert type rating scale: some extent (1point), large extent (2points) and a very large extent (3points).

The mean can be calculated as follows:

$$\bar{X} = \frac{\sum fx}{N}$$

Where:

$\bar{X}$ = Mean response

$\sum$ = Summation

f = number of respondents choosing a particular scale point

x = value of each scale

N = total number of respondents

Any mean score greater 2 is high while the mean score is less than 2 is low

Constraint faced in Adoption of Cashew Farm Management Techniques was measured on 3-points Likert scale: not serious (1point), serious (2points) and very serious (3points).

The mean can be calculated as follows:

$$\bar{X} = \frac{\sum fx}{N}$$

Where:

$\bar{X}$ = Mean response

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f = number of respondents choosing a particular scale point

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Result and Discussion

Socio-economic Characteristics of Cashew Farmers

The socioeconomic characteristics of the respondents are presented in Table 1. The major socioeconomic variables described in this study include: Gender, age, marital level, household size, educational status, farm size, annual income, and years spent schooling and number of extension visit. From the distribution, 85.8% of the respondents were males, while 14.2% were females. This means males were more

engaged in Cashew farming activities compared to their female counterpart in the study area; and this is because male in traditional African setting is the head of the family and they also have access to land use and ownership, production inputs and information more than the female. This is in agreement with Pelemo, Mohammed, Omake, Opara and Nnachukwu (2019) who reported in their findings that 94.3% of cashew producers were male while 5.7% were female

The distribution of respondents according to age as presented on Table 1 shows that (75.8%) of the respondents are between the ages of 31-60 years, 13.3% of the respondents were between the ages of 61 and above, while the remaining 10.8 percent of the respondents were <30 years. This indicates that most of them were still in their prime age and would be ready to learn and apply the skill of adoption of farm management techniques on their cashew farm. This finding is supported by Ejechi (2015) that farmers of age 41-60 were still at their productive age. The result on marital status on Table 3.1 shows that. 74.2 % of the total farmers were married, 10% of the total distribution were single, 8.3% of the distribution were divorced, whereas, 7.3% were widow. This means that most of the people involved in farming are married and gained support from their spouse in caring out farming activities and less of hired labour in performing farm operations. It is also in line with the finding of (MujidatAjoke, 2020) on adoption of cocoa production technologies, revealed the significance of marital status on agricultural production in terms of the supply of agricultural family labour. The results further showed that 22.5% of the respondents have no formal education, 21.7 % attended

primary school, 33.3% had secondary education and 22.5% attended tertiary education. Indicating that majority of cashew farmers in the study area had one form of education or the other. This finding agrees with Sekar and Karunakaran (2014) who reported that those with formal education have 14.6% higher prediction to adopt new innovation in cashew production. From the result on Table 1 most (62.50%) of Cashew farmers in the study area had farm size of 1-4 hectares. This is in line with Adesina et al., (2010) who reported that majority of cashew farmers cultivate 0.10-5.99 hectares. Similarly, Hammed and Anikwe (2008) in their findings revealed that 1 - 4 hectares is the average farm size owned by cashew farmers in Nigeria

The result in Table 1 shows that 56.7% of the respondents have annual income of ₦140, 000 and below; 12.5% of cashew farmers have annual income of ₦141, 000 – ₦240, 000 and 30.8% of the respondents have annual income of ₦241, 000 and above. According to Mathenge and Teschirley (2008), income is among the socio-economic characteristics that are said to influence farming decisions by the farmer because farm practices depend on capital investment especially when the capital is dependent on the existing source of income. The result on Table 1 further shows that 24.2% of Cashew farmers had 1-3 contact with extension agent in a year while majority (75.80%) of the respondent do not have any contact with the extension agent. This indicates a very poor interaction between the farmers and extension agents in the study area. This could be as a result of inadequate personnel in the field .Paul (2009) found out that the ratio of extension agents to farmers is about 1: 25,000 in Kwara state.

Table 1: Distribution of Cashew Farmers According to their Socioeconomic Characteristics

Socio economic characteristic	Frequency	Percentage	Mean/Mode
Gender			
Male	103	85.8	
Female	17	14.2	
Total	120	100	
Age			
≤ 30	13	10.8	
31-60	91	75.8	49 years
61 & above	16	13.3	
Total	120	100	
Marital status			
Married	89	74.2	
Singled	12	10.0	
Divorced	10	8.3	
Widow	9	7.3	
Total	120	100	
Educational level			
No formal education	27	22.5	
Primary education	26	21.7	
Secondary education	40	33.3	
Tertiary education	27	22.5	
Household size			
1-5	50	41.7	
6-10	48	40.0	7
≥11	22	10.3	
Total	120	100	
Farm size			
1-4	75	62.5	4ha
5-10	39	32.5	
≥11	6	5.0	
Total	120	100	
Annual income			
≤140,000	68	56.7	₦ 279,275
141,000 -240,000	15	12.5	
≥ 240,000	37	30.8	
Total	120	100	
Extension contact			
No extension agents contact	91	75.8	No extension visit
1-3	29	24.2	
Total	120	100	

Source: Field survey, 2021 No of Respondents = 120

Table 2 shows that majority, (98.3%) of the Cashew farmers in the study area adopted pruning as a technique in cashew production. Larger proportions of the respondents in the study area were engaged in pruning cashew

plantation as pruning improve development of cashew branches and increase cashew yield production. This is also in support of Brown *et al.*, (2004), who stated that most of the cashew farmers in the study area prune

their cashew trees for uniformity and distinction in canopies. The results further showed that (75%) of the respondents involved in selective thinning as a technique in cashew production. Majority of cashew farmers in the study area adopted selective mainly for removal of weak, diseased or less- vigorous plant from a plantation or field. With respect to record keeping, (74.2%) of the cashew farmers adopt record keeping as cashew management technique in the study area. This indicates that record keeping assist cashew famers to know whether there is improvement and increase in yield and quality in their cashew

plantation. This result corroborates with the result of Dagg and Tapley (2008) find out that 70% of the rural household in cashew production engaged in keeping records mainly to know the cashew trees that increased in yield and the ones with poor yield. The yield of cashew is not necessarily measured by the appearance of healthy apples alone as seen in Figure 1, but also the quantity and quality of the nuts produced in a given season. In terms of “Fire tracing” and “Fertilizer application” (97.5%) and (63.3%) of the respondents adopted fire tracing and fertilizer application cashew management techniques in the study area respectively.

Table 2: Distribution of the Respondents According to the Types of Cashew Management Techniques Adopted

Management Technique	Frequency	Percentages (%)
Pruning	118	98.3
Selective thinning	90	75.0
Recording taking	89	74.2
Fire tracing	117	97.5
Fertilizer application	76	67.3

Source: Field survey, 2021 Note: multiple responses



Figure 1: Cashew tree with its Apples from the study area

The extent of adoption of farm management techniques by cashew farmers in the study area o Table 3 above revealed that 26.07%, 9.17% and 64.17% of the respondents with the mean score of 2.38 indicated that they engage in pruning to some extent, large extent and a very large extent respectively. This is because the more the farmers engage in pruning their Cashew trees, the more it increases in production and it will be open to more sunlight and aeration which are essential for the development of the plant.

With respect to selective thinning (48.33%), (39.17%) and (12.50%) of the respondents with the mean score of 1.64 were engage in selective thinning to some extent, large extent and to a very large extent respectively. Thinning is a very important agronomical practice which helps to bring about normal plant population per stand and proper distances between and among the plants while on the main field. This helps the cashew to grow well and by extension increase the yield per hectare. While in terms of record keeping, (44.17), (40.83%) and (15.0%) of the respondents with the mean score 1.71 were engaged in record

taking to some extent, large extent and a very large extent respectively. Record keeping though an enduring task help farmers track their performances in terms of evaluation of their productivity in the cashew farming. This allows them to make proper budget and appropriation of their fund for the next season. In terms of fertilizer application (50.83%), (33.33%) and (15.83%) of the respondents with the mean score 1.65 engage in fertilizer application to some extent, large extent and a very large extent respectively.

The result also revealed that (10.83%), (15.83%) and (73.33%) with a mean score of mean score of 2.63 engage in fire tracing to some extent, large extent and a very large extent respectively. This implies that cashew farmers in the study area adopt pruning and fire tracing farm management techniques to a very large extent but record keeping, selective thinning were least adopted. This result is in line with Olifeet *al.*, (2013), who stated that 90% and 80% of cashew producing household are engaged in pruning and fire tracing as farm management technique.

Table 3: Distribution of Respondents according to Extent of Adoption of Cashew Farm Management Techniques

techniques	TSE (1)	LE (2)	ALE (3)	Sum of responses	Mean
Pruning	32(26.07)	11(9.17)	77(64.17)	285	2.38*
Selective-thinning	58(48.33)	47(39.17)	15(12.50)	197	1.64
Record taking	53(44.17)	49(40.83)	18(15.00)	205	1.71
Fertilizer application	61(50.83)	40(33.33)	19(15.83)	198	1.65
Fire tracing	13(10.83)	19(15.83)	88(73.33)	315	2.63*

Source: Field survey, 2021 * Perceived farm management techniques. Figures in parentheses represent percentage Note: TSE= To some extent, LE = Large extent, ALE =A Very large extent.

The distribution of respondent according to constraint faced in adoption of cashew management techniques on Table 4 revealed that (39.17%), (27.50%), (53.33%) of the respondents (not serious, serious and very serious) with the mean 2.34 see lack of fund

as a constraint in adoption of cashew management technique. The result also revealed that (22.55%), (31.67%) and (45.83%) of the respondents with a mean 2.23 are constraints by poor access to training facility from not serious, serious and

very serious respectively. While, (34.17%), (36.17%) and (39.17%) of the respondents with the mean 2.15 claimed that shortage of land constraint the adoption of farm management technique as not serious, serious and very serious respectively. In terms of technology know - how, (25.83%), (27.50%) and (46.67%) of the respondent with the mean score of 2.21 as not serious, serious and very serious said technology know-how constrain the adoption of cashew management techniques respectively. (20.0%), (34.17%) and (45.83%) of the respondents with the mean of 2.26 as not serious, serious and very serious claimed inadequate extension services constrain the adoption of cashew farm management technique. The result also revealed that, (16.67%), (32.50%) and (50.83%) of the respondent with a mean score of 2.34 rated lack of social amenities as a constraint in

adoption of cashew management technique as not serious, serious and very serious respectively. With respect to high cost of input (13.33%), (13.33%) and (54.17%) of the respondents with a mean of 2.41 claimed that high cost of input constraint in adoption of cashew farm management technique.

This can be deduced that lack of fund, poor access to training facilities, shortage of land, technology know-how, inadequate extension services, and lack of social amenities and high cost of inputs are the serious constraint faced by cashew farmers in the adoption of cashew management techniques. This finding is in consonance with Oladejo (2015), who stated that inadequate extension service, access to fund and lack of good roads were some of the major problems faced by cashew marketers in Nigeria.

Table 4: Mean Distribution of Respondent according to Constraint faced in Adoption of Cashew Farm Management Techniques

Constraints	Not serious	Serious	Very serious	TSS	MS
Illiteracy	49(40.8)	34(28.38)	37(30.83)	228	1.9
Ignorant about farm management	44(36.7)	34(28.33)	42(35.00)	238	1.98
Lack of fund	23(39.17)	33(27.50)	64(53.33)	281	2.34*
Poor access to training facility	27 (22.55)	38(31.67)	55(45.83)	268	2.23*
Age of farmers	66(34.17)	30(25.00)	24(20.00)	198	1.65
Reduction in cashew yield	41(55.00)	62(51.67)	17(34.17)	216	1.8
Shortage of land	29(34.17)	44(36.17)	47(39.17)	258	2.15*
Insecurity	52 (24.17)	33(27.50)	35(29.17)	223	1.86
Technology know how	31(25.83)	33(27.50)	56(46.67)	265	2.21*
Inadequate extension services	24 (20.00)	41(34.17)	55(45.83)	271	2.26*
Lack of social amenities	20 (16.67)	39(32.50)	61(50.83)	281	2.34*
High cost of input	16 (13.33)	39(32.50)	65(54.17)	289	2.41*

Source: Field survey, 2021 * Perceived Constraints

Conclusion and Recommendation

It is evident that cashew farmers in the study area adopt cashew management techniques such as pruning, selective thinning, record taking, and fire tracing and fertilizer application. Despite the adoption of these management techniques, the study established that pruning and fire tracing were the cashew management techniques that

were used to a very large extent by cashew farmers in the study area. Several factors constrain the adoption of cashew management techniques by farmers in the study area are: lack of fund, poor access to training facility, loss of land, technology know how, poor access to extension agents, lack of social amenities and the cost of fertilizer. Based on these findings, the

following recommendations were made:

- i. Efforts by both public and private sectors to improve the livelihood of farmers should be geared at educating the farmers in the areas that are targeting improved income, living standard and farming system since they are all functions of adoption improved management techniques
- ii. Improvement in extension services by proper and appropriate dissemination of cashew management technologies to farmers through direct contact or mass media in order to encourage cashew farmers on the appropriate technology to adopt in cashew farming.
- iii. Extension officers should ensure a more flexible and sustainable adoption of cashew production technologies by devising a system that allows diffusion of innovation within and among farmers. This can be achieved by farmer-to-farmer extension by the categories of farmers who to a large extent adopted these cashew management techniques
- iv. Cashew farmers should form registered union through which they can find solution to challenges of poor access to training facility, inadequate land, technology know how, poor access to extension agents that constrain them in adopting cashew management techniques.

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