Assessment of Tree Crops' Combination with Cashew and Yield Accruable to Farmers in Kogi State

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Abstract— *Cashew is widely grown in Nigeria, spanning from the coast to the savannah in the northern part of the country.lt is particularly suitable for the control of soil erosion in the south end and desert encroachment in the north, hence it is found in many states of Nigeria.lt is tolerant of poor soil and low rainfall hence ,wide adaptability. This study examined selected personal characteristics of the respondents, identified farm characteristics and planting pattern of the farmers" farms, ascertained the yield and revenue generated from sales of crops intercropped with cashew ,and identify the constraints experienced by the respondents. Kogi State was purposively selected because cashew is predominantly grown in the State. Three local government areas ,Ankpa, Dekina and Ofu were randomly selected while 25, 24 and 22 farmers were selected from the three LGAs respectively , making a total of 71 respondents who were interviewed using interview schedule. Majority (74.6%) of the respondents were below 60 years of age, 63.4% of them had 1-20 years of experience and 85.9% were males. Most of the respondents are small scale farmers with 59.2% of them possessing farm size of 1-5 hectares .They mostly planted small and medium nuts size and 36.6% planted small size .Most (94.4%) of the respondents spent as much as ₦ 41,500 for clearing their farm .The respondents realized revenue of between ₦20,000 to ₦ 141,000, citrus ₦2,000 to ₦ 20,000, Mango ₦500 and above ₦32,500.Marketing price was indicated as the pressing constraints by the respondents .The regression result revealed that revenue is determined by the yield of the respondents .The R^2 is 0.396 which shows that yield can account for 39.6% of farmers revenue while other variable such as taste, cashew substitutes accounted for 60.4%. The B value of 0.629 shows a strong positive correlation between yield and respondents' revenue .The respondents were small scale farmers and need assistance in the area of marketing price and credit facilities. Cocoa Research lnstitute of Nigeria (CRIN) and other relevant stakeholder should link farmers with registered exporters to improve the low pricing constraints faced by them.*

Keywords— Cashew , revenue ,farm characteristic , yield ,trees crop.

I. INTRODUCTION

Cashew *Anacardium occidentale* belongs to the Anacardiacea family of plants.lt is commonly found in Tropical countries, and it is believed to have been introduced into East Africa and Nigeria by the Portuguese explorers in the 16th century, as a means of controlling coastal erosion and used for aforestation, (ohler,1979).The major world producers are India ,Brazil, Vietnam ,Nigeria while the highest cashew consuming nations are in the North America Europe ,Far East ,(Japan) and Australia .The major African countries in international cashew business are Tanzania, Mozambique, Kenya ,Guinea Bissau and Cote D'voire .Africa is a major continental producer of cashew accounting for about one –third of world total cashew nut output of 1.6 million metric tons . Cashew is widely grown in Nigeria, from the coast to the savannah in the northern part of the country .lt is particularly suitable for the control of soil erosion in the south end and desert encroachment in the north, hence it is found in many states of Nigeria.lt is tolerant of poor soil and rainfall hence ,wide adaptability.

Since ,farming system research has a primary objective, which is the betterment of the farming environment based on the farmers present system which has evolved through thousands of years and is adapted to the social, economic ,and ecological forces of the area, there is the need to have a comprehensive data based on those factors which mold the system we wish to improve . ln most cases ,cashew produces fruit once in a season mainly though some are off season but usually negligible .Consequently, the income stream of farmers is equally a single season and it is in this connection that the needs to assess the production system of cashew come into play. What is it that could be done to diversify the economic resources of cashew farmers, especially the poor resources farmer. Based on the planting system and geometry of cashew in the plot, CRIN recommended some intercrops to be planted with cashew in the early years of its plant life, such as groundnut and some legumes, but all varieties of

sorghum and millet should be avoided because of deleterious effect of shade on cashew plant.

Consequently, it is this aspect that calls for a close assessment of the farming systems of cashew in Nigeria, with a view to enhancing the economic potentials of farmers and optimum utilization of the landmass under cashew plot.

II. OBJECTIVES OF THE STUDY

The major objective is to assess of tree crop' combination with cashew and yield accruable to farmers in Nigeria, while the specific objectives are to:

I examine selected personal characteristics of the respondents in the study area

2 ascertain the yield and revenue generated from sales of crops intercropped with cashew and

3 identity the constraints experienced by the respondents in study area

III. METHODOLOGY

Cashew is cultivated in all agro –ecological Zones in Nigeria from the coast to the savannah on wide varieties of soils and climatic conditions. The economics of the crops cultivation depends largely on the type of farm on which the crop is grown and the genotypes planted .However, one geopolitical zone, North Central Zone consisting of seven states; Benue. Niger, Katsina. Kogi, Kwara, Nassarawa and Plateau were used. Out of these states, Kogi State was purposively selected because cashew is heavily planted in the state. An interview schedule coupled with farm visits are primary mode of data collection from farmers and farm sites. Primary data were used to obtained information from the respondents and small scale cashew farmers were the main target respondents.

Multi- stage sampling procedure was adopted. In choosing the states, out of the seven states in North-central zone, Kogi State was purposively selected. Three local government areas (LGAs) were selected, using simple random sampling technique. The three local government areas are Ankpa, Dekina, And Ofu. 25, 24 and 22 farmers were randomly selected from Ankpa, Dekina and Ofu LGAs respectively making a total of 71 respondents using interview schedule.

IV. RESULTS AND DISCUSSION

A. PERSONAL CHARASTERISTICS

Table.1: Distribution of respondents based on age

Age	Frequency	Percentages
21 – 30	7	9.9
31 – 40	14	19.7
41 – 50	16	22.5
51 – 60	16	22.5
>60	18	25.4
Total	71	100.0

Source: Field survey, 2013

Result in table 1 revealed that majority 74.6% of the respondents were below 60years of age while few (25.4%) were above 60years. This implies that most of the farmers were still in their prime age which will enable them carry out farming activities. Odebode et al (2006) reported that farmers in their prime age are favourable to cashew production since cashew farming requires intensive labour.

Table.2: Distribution of respondents based on sex

Sex	Frequency	Percentage
Male	61	85.9
Female	10	14.1
Total	71	100.0

Source: field survey, 2013

Table 2 result revealed that 85.9% were males while 14.1% were females. This is an indication that more males are into cashew farming than females. In Nigeria agro-communities females are most marginalized in the distribution of assets especially land for tree crops. This finding is in consonant with Abubakar (2003) who reported that women in some communities in Nigeria are given opportunity to cultivate arable crops on their husbands plot; access to tree crop production is usually restricted.

Table.3: Distribution of respondents according to size of house-hold.

Size of H/H	Frequency	Percentage
1 – 5	10	14.1
6 – 10	37	52.1
11 – 15	15	21.1
16 – 20	9	12.7
Total	71	100.0

Source: Field survey, 2013

An average proportion (52.1%) of the respondent has a household size of 6 – 10 which will favour the respondent if the members of the household will assist in farming activities (Table 3). According to Adeogun *et al* (2010) high numbers of children in the house hold may totally be a favourable condition to cashew production if the children help in farming activities.

Table.4: Distribution of respondents based on farming experience.

Years of experience	Frequency	Percentage
1 – 20	45	63.4
21 – 40	22	31.0
41 – 60	4	5.6
Total	71	100.0

Source: Field survey, 2013

Analysis from the result in table 4 shows that most (63.4%) of the respondent had 1 – 20 years of experience while very few (5.6%) had above 40years. This implies that farmers were well experienced in cashew farming which will be an advantage in accepting new technologies for adoption. Uwagboe (2004) suggested that more information should be disseminated to cashew farmers with low cashew experience.

Farm characteristics.

Table.5: Distribution of respondents based on farm size.

Farm size	**Frequency**	**Percentage**
1 – 5 ha	42.0	59.1
6 – 10 ha	16.0	22.5
11 – 20 ha	11	15.5
>20 ha	2	2.8
Total	71	100.0

Source: Field survey, 2013

The result in Table 5 reveals that the respondents are small scale farmers as most (59.2%) of them possess farm size of 1 – 5 ha. The size of their farms could affect the income they earn from their produce. Olayide (1980) in his study reported that farmers with less than 10 ha of land are regarded as small scale farmers.

Table.6: Distribution of respondents based on cropping system.

Cropping system	Frequency	Percentage
Mono cropping	9	12.7
Mixed cropping	62	87.3
Total	71	100.0

Source: Field survey, 2013

The result in Table 6 reveal shows that 12.7% of the respondents crop only cashew while 87.3% carry out mixed cropping. The respondents that carry out mixed farming will earn more income than mono cropping

farms which is corroborating the report of Adeogun, et al (2010) report that cashew farmers intercrop to generate enough income for their household.

Table.7: Distribution of respondents based on the cashew varieties planted.

Cashew varieties	Frequency	Percentage
Jumbo	8	11.3
Large	10	14.1
Medium	27	38.0
Small	26	36.6
Total	71	100.0

Source: Field survey, 2013

The result in table 7 reveals that 38.0% of the respondents planted medium size cashew and 36.6% planted small size while 25.4% planted large and jumbo nut size.

This result implies that farmers in the study area are more into farming of medium and small sized which could mean that they attract better price than large size for the farmers. This result is contrary to Olunloyo (1996) findings that large size of nuts is more acceptable for export.

Table.8: Distribution based on different operations and cost. (N=71)

Activities	Mean cost (₦)	Frequency	Percentage
Site selection	15,500	11	15.5
Clearing	41,500	67	94.4
Felling	41,000	70	98.6
Burning	22,600	42	59.2
Packing	23,000	54	76.1
Hoeing	25,500	60	84.5
Pegging	8000	26	36.6

Source: Field survey, 2013

Based on the result in table 8 it shows that (15.5%) of the respondents spent an average of ₦15,500 for site selection which implies that most farmers do not spend so much on site selection. Majority (94.4%) of the respondent spent as much as ₦41,500 for clearing while 98.6% spent ₦41,000 for felling. This implies that the highest expenses incurred by the farmer is on clearing and felling of trees in their farms.

Yield and revenue of Intercrops

Table.9: Distribution of respondents based on yield and revenue of Citrus (N= 71)

Yield of citrus (bags)	Frequency	Percentage
3-10	4	5.6
11-18	1	1.4
19 and above	2	2.8
Did not intercrop with citrus	64	90.1
Revenue realized (₦)		
2, 000 – 10,000	5	7.0
12,000-20,000	2	2.8
No revenue from citrus	64	90.1

Source: field survey, 2013

In table 9, majority (90.1%) of the respondents did not plant citrus with cashew and could not get any income from them. For the few that planted, only 9.8% had above 19 bags with revenue of ₦12,000 to ₦20,000 realized from their sales per annum. It implies that citrus is not a

popular tree crop which is planted along side with cashew farms in the Kogi state.

Table.10: Distribution of respondents based on yield and revenue of mango (N= 71)

Yield of mango (bags)	Frequency	Percentage
2-9	7	9.9
10-17	8	11.3
18-25	3	4.2
26-33	1	1.4
34 and above	2	2.8
Did not intercrop with mango	50	70.4
Revenue realized (₦)		
500-8,000	6	8.5
8,500-16,000	3	4.2
16,500-24,000	4	5.6
24,500-32,000	1	1.4
32,500 and above	3	4.2
No revenue from mango	54	76.1

Source: field survey, 2013

The result in Table 10 shows that 70.4% of the respondents did not intercrop mango with cashew while 21.2% planted mango and many obtained up to 17 bags per annum. Few of them (12.7%) realized between ₦500 and ₦24,000 while 4.2% made above ₦32,500 per year. It means that mango is less cultivated in cashew farms in the study area.

Table.11: Distribution of respondents based on yield and revenue of Kola (N= 71)

Yield of kola (baskets)	Frequency	Percentage
1-2	4	5.6
Did not intercrop with kola	67	94.4
Revenue realized (₦)		
4,000-35,000	3	4.2
No revenue from kola	68	95.8

Source: field survey, 2013

Table 11 reveals that few (5.6%) of the respondents planted kola in their cashew farms while most (95.8%) of them did not intercrop with kola. 4.2 percent realized between ₦4,000 and ₦35,000 per annum. The result indicates that kola was not a common tree crop used in cashew farm in the study area.

Table.12: Distribution of respondents based on yield and revenue of Oil Palm. (N= 71)

Yield of oil palm (litres)	Frequency	Percentage
Less than equal to 50	14	19.7
51-100	3	4.2
101-150	1	1.4
151-200	4	5.6
201 and above	6	8.5
Did not intercrop with oil palm	43	60.6
Revenue realized (₦)		
1,500 – 50,000	18	25.4
51,000-99,500	3	4.2
100,500-149,000	4	5.6
150,000-198,500	2	2.8
199,500 and above	1	1.4
No revenue from oil palm	4.3	60.6

Source: field survey, 2013

Table 12 revealed that 60.6 percent of the rural respondents did not plant oil palm with cashew. A smaller number representing 19.7% of those that planted got less than or equal to 50 litres of palm oil from their cashew farms per year. A few others obtained something above 201 liters.

Oil palm constitutes the main crop cultivated to a large extent when compared with other tree crops in cashew farms in the study area. The result did not agree with that of Aliyu and Hammed (2008). They reported that majority of the farmers in Nigeria combine cashew cultivation with major commodity crops like cocoa, oil palm, rubber or kola.

Table.13: Distribution of respondents based on constraints experienced (N=71)

s/n	Constraints	Frequency	Percentage
1	Storage facilities	15	21.1
2	Diseases	18	25.4
3	Fire	9	12.7
4	Credit facilities	47	66.2
5	Transportation	28	39.4
6	Farm tools	13	18.3
7	Herbicides	15	21.1
8	Fertilizer	12	16.9
9	Labour	14	19.7
10	Insecticides	11	15.5
11	Poor market price	71	100.0

Source: field survey, 2013

In Table 13, among the constraints all (100%) respondents had poor market price as a problem and credit facilities is another major constraint of the respondents as indicated by 66.2% of the respondents. These could be lack of Government assistance in the terms of input supply and loan, and due to irregular market prices of the buying agents.

This study is similar to the study of Uwagboe *et al* (2010) in which cashew farmers ranked inadequate capital and lack of processing industries as the most severe constraints in Orire Local Government Area Of Oyo-state,

Table.14: Regression Result

Variable	Beta	T	P	R^2	Adjusted R^2	F
Yield of cashew	0.629	6.061	0.000	0.396	0.385	36.735

Source: field survey, 2013

Table 14: There is no significant contribution of yield to revenue of cashew farmers.In Table 14 the regression result shows that Y=37, 5352 and X = 20.876.2 which reveals that yield in tones can be used to predict farmers, revenue all things being equal. The R^2 is 0.396 which shows that yield can account for 39.6% of farmers' revenue while other variables such as price, taste, cashew substitutes etc. will account for 60.4% the B value of 0.629 shows a strong positive correlation between yield and respondents' revenue which means that as yield increases the respondents' revenue increases.

V. CONCLUSION AND RECOMMENDATIONS

The rationale behind this work is to examine farmer's combination of tree crops with Cashew and yield accruable to farmers in Kogi state. The results indicated that most of the respondents were below 60 years of age .They had long years of farming experience with more males dominating cashew production in the study area . The major constraints faced by the respondents were poor marketing price. In addition, since respondents are small scale farmers, they need assistance on areas of marketing price and credit facilities. Based on the findings from the study, the following are recommended as possible solutions to the stated problems by the respondents.

1. Government should provide credits facilities to small scale farmers.
2. Cocoa Research institute of Nigeria (CRIN) and other relevant stakeholders should assist farmers

with inputs and link them with registered exporters to alleviate low pricing problem faced by farmers.

3. Farmers should be trained on Best Crop Combination (BCC) in tree crops.
4. Youth in the study area should be encouraged to engage in Agriculture through provision of social amenities, farm inputs similar to what is obtainable in the cities to the cashew producing areas.

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