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Attitude of farmers towards domestication of shea tree cultivation in Niger State, Nigeria

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Abstract

Despite the socio-economic potentials of shea tree and its ability to grow well in Niger State, the tree crop is yet to be domesticated in farms. Thus, the study examined the attitude of farmers towards the cultivation of shea tree in Niger State, Nigeria. To achieve the study objectives, 210 respondents were randomly selected for the study and data were collected using validated interview schedule with reliability coefficient of 0.85. The collected data were analyzed using descriptive statistics and logit regression model. Result indicated that the mean age of the respondents was 52 years. Number of shea trees owned by 50.48% of the respondents ranged from 15–20 trees which mostly grow naturally. Result further revealed that the respondents had favourable attitude towards most of the issues bordering on shea trees domestication. The issues that attracted least unfavourable attitude were long gestation period and inadequate awareness on the need to plant and manage wild trees. Factors that influenced willingness to plant shea trees were sex, attitude, land ownership, educational level and marital status. Therefore, it was recommended that youths, women and married couples should be encouraged by government to go into shea trees cultivation. It was also suggested that farmers should be educated by extension agents to encourage on-farm shea tree planting culture and agroforestry initiatives.

Introduction

Shea butter tree is indigenous to Sub-Saharan Africa of which Nigeria is the largest producer of shea nuts in West Africa. In Nigeria, the abundance of shea trees exists in and thrives almost exclusively in the North, where they mostly grow naturally in the wild. The shea trees have potentials to contribute significantly to the economic and industrial development of Nigeria and by extension improving the quality of life of the people (Lovett, 2004; FAOSTAT, 2013). Shea tree products are widely used for domestic purpose for eating, cooking, lightening, skin moisturizer and commercially as ingredients in cosmetic, pharmaceutical and edible products (Akihisa *et al.*, 2010). According to Lovett (2004), shea butter are utilized as hair dressing cream, protecting skin from harsh weather, relieving rheumatic, healing of wounds, swellings and bruises as well as for the treatment of eczema, rashes and dermatitis. Thus, in recent times shea tree has gained a lot of recognition as an economic tree both locally and internationally because of high demand for its butter and wide range of industrial application of its products.

However, despite the socio-economic potentials of the shea tree and its ability to grow well in the region, the economic tree is yet to be domesticated and cultivated in form of organize farms by farmers, as majority of the farmers go to the wild to pick shea nuts which grow naturally untended. This background necessitate this study to generate information on attitude of farmers towards domestication of shea tree cultivation to

enhance the activities of Agricultural Development Programmes and Forestry Departments in helping rural farmers to improve their incomes and opportunities to alleviate poverty as well as protecting the environment. The specific objectives were to: describe socio-economic characteristics of farmers; ascertain number of shea trees owned by the farmers; determine the attitude of farmers towards domestication of shea tree production; and determine factors influencing the willingness of the farmers to plant shea trees.

Methodology

The study was conducted in Niger State located in the Guinea Savannah ecological zone of Nigeria. The coordinates of the State is 10.2155° N, 5.3940° E, with annual growth rate of 3.4%, the State has estimated population of 5,337,149 in 2015. About 85% of the people of the State are farmers. Annual rainfall ranges from 1,100 mm in the Northern part to 1,600 mm in the Southern part of the State. The mean average temperature is around 32°C. Some of the crops grown in the State are yam, cotton, maize, sorghum, millet, cowpea, soybean, cowpea, rice and groundnut. While some of the tree crops grown are mango, citrus, coconut, cashew, banana, pawpaw. Livestock reared include goat, sheep, cattle, chicken, camel and donkey. Niger State has 25 Local Government Areas with three Agricultural Zones (Niger State Geographic Information System, 2007).

Multistage sampling technique was adopted for the selection of respondents for this study. The first stage was random selection of three Local Government Areas (LGA) namely Katcha, Muya and Mashegu from Agricultural Zones I, II and III respectively. The second stage involved random selection of three communities in each Local Government Area. The third stage was simple random selection of 10% of farmers from the selected nine communities. In all, a total of 210 respondents were selected for the study from the sampling frame of 2,100 farmers established through village heads with the assistance of village extension agents attached to the localities sampled.

Instrument of data collection was validated through experts' consultation and literature scan. The validated interview schedule which was subjected to Cronbach's Alpha reliability test ($r = 0.85$) was used for data collection. Data were collected on socio-economic characteristics, number of shea trees owned/method of propagation and attitude towards shea tree cultivation. Socio-economic characteristics such as age, educational level and farming experience were measured in years, while sex, marital status, land ownership and willingness to plant shea tree were measured as dummy variables. Shea trees owned were measured in numbers and method of propagation was determined by asking respondents to indicate their methods of propagation. Attitude towards domestication of shea tree was determined using 5- points Liker scale. To determine farmers' attitude towards each of the attitudinal statement, the values of the scale (1+2+3+4+5) were summed up to get 15. The sum was further divided by 5 to obtain 3 which is the mean. The cut-off means score of 3.0 was considered as the decision point. A mean score of 3.0 and above depicts a favourable attitude, while a mean score below 3.0 was considered as unfavourable attitude.

Formula:

$$\text{Attitude} = \frac{1 + 2 + 3 + 4 + 5}{5} = 3 \text{ (cut-off mean/decision point)}$$

Interpretation

Mean score of 3 and above imply favorable attitude

Mean score below 3 connote unfavorable attitude.

Objectives one, two and three were achieved using descriptive statistics, while objective four was achieved using logit regression analysis. A dummy variable as a proxy for the dependent variable having a value of 1 for willingness to plant shea tree and a value 0 for not willing to plant shea tree. The logit regression model has the form: $e^{\alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \dots + \beta_n \chi_n} / 1 + e^{\alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \dots + \beta_n \chi_n}$. Where e is the base of natural logarithms, α is the coefficient of the (intercept), β_n are slope parameters (coefficients) and χ_n are the values of the independent variables. i.e.

$Y = (1 \text{ for willingness to plant shea tree and a value } 0 \text{ for not willing to plant shea tree})$

$X_1 = \text{Educational level (years)}$

$X_2 = \text{Age (years)}$

$X_3 = \text{Sex (male=1, female=2)}$

$X_4 = \text{marital status (married=1, single=0)}$

$X_5 = \text{Farming experience (years)}$

$X_6 = \text{Attitude (score)}$

$X_7 = \text{Land ownership (owner=1, otherwise=0)}$

Results and Discussion

Socio-economic Characteristics of Respondents

The result in Table 1 indicated that the mean age of the respondents was 52 years. The finding suggests that most of the people who were involved in farming activities in the study area are approaching old age, which is not good for agricultural transformation. This finding is in line with the reports of Adeolu and Taiwo (2004) who stressed that the average age of farmers was 50 years. Table 1 also showed that 43.33% of the respondents had primary education. This was followed by 11.42% who had secondary education. Tertiary and adult education had 8.10% response rate each. This implies that most of the respondents attained certain level of formal education, which would facilitate understanding of improved method of shea tree cultivation and make the respondents more receptive to advisory services.

Table 1. Socio-economic characteristic of respondents

Socio-economic characteristics	Frequency	Percentage
Age		
20-40	31	14.76
41-60	126	60.00
61-80	53	25.24
Mean	52 years	
Educational level		
No formal education	61	29.05
Adult education	17	8.10
Primary education	91	43.33
Secondary education	24	11.43
Tertiary education	17	8.10
Sex		
Female	52	24.76
Male	158	75.24
Marital status		
Married	184	87.62
Single	26	12.38
Farming experience		
1-5	16	7.61
6-10	27	12.86
11-15	73	34.76
16-20	56	26.67
Above 20	38	18.10
Mean	17.87 years	
Land ownership		
Yes	192	91.43
No	18	8.57
Willingness to plant shea tree		
Yes	186	88.57
No	24	11.43

Source: field survey, 2017

Finding in Table 1 showed that 75.24% of the respondents were male while the remaining 24.76%

were female. This implied that male dominate agricultural activities in the study area. The result further revealed that high proportions (87.62%) of the respondents were married. Olaleye *et al.* (2009) said that majority of farmers in Nigeria were male and married. Similarly, Table 1 indicated that the mean years of farming experience of the respondents was about 18 years which suggests that the respondents had long years of experience and expertise in farming which is expected to influence shea production positively. Also, Table 1 showed that 91.43% of the respondents were the owners of their farm lands, of which 88.57% of them were willing to domesticate the cultivation of shea trees in their respective farms.

Number of Shea Trees Owned and Method of Propagation

Finding in Table 2 showed that 50.48% of the respondents owned between 15–20 shea trees, while 29.05% of the respondents had between 21–25 shea trees in their farms. This was followed by 6.67%, 6.19%, 4.29% and 3.33% who owned between 26–30, 11–15, 6–10 and 1–5 shea trees, respectively. The result implied that the number of shea trees owned by most of the respondents in the study area ranged from 15–20 shea trees, which grow alongside arable crops such as yam, maize, sorghum, cowpea, millet, groundnut, melon, rice among others. Field assessment showed that many farmers were not willing to grow and manage shea trees alone as a sole crop, but they prefer to retain them together with the arable food crops in their farms. On method of propagation, 67.14% of the respondents indicated that their shea trees grow naturally in their farms. This finding concur with the report of Hatskevich *et al.* (2011) who stressed that shea trees grow mostly in the wild in African countries. However, 32.86% of the respondents reported that some shea trees were transplanted (Table 2). The respondents stressed that shea trees found growing naturally during land clearing for new plots were either preserved or transplanted. Some may have germinated from threw away seeds after eating the fresh or regenerated from coppicing.

Table 2. Distribution of respondents based on number of shea trees owned and method of propagation

Variables	Frequency	Percentage
Number of shea trees owned		
1–5	7	3.33
6–10	9	4.29
11–15	13	6.19
15–20	106	50.48
21–15	61	29.05
26–30	14	6.67
Method of propagation		
Planted	-	-
Transplanted	69	32.86
Grow naturally	141	67.14

Source: field survey, 2017

Attitude of Farmers towards Domestication of Shea Trees Cultivation

Entries in Tables 3 revealed that the following positive statements elicited favourable attitude from the respondents: “cultivation of shea trees would serve as a good source of income” ($\bar{x} = 4.21$), “domestication of shea trees will provide families with edible fruits” ($\bar{x} = 4.01$), “planting of shea trees would provide shade in the farms and serve as a wind breaker” ($\bar{x} = 3.75$), “propagation of shea tree has a lot of medicinal values” ($\bar{x} = 3.05$), “growing of shea trees will provide families with butter for cosmetic purposes” ($\bar{x} = 3.02$) and “domestication of shea trees in farms would provide fire wood and building/mortal making materials” ($\bar{x} = 3.00$). Also, the respondents had favourable attitude towards the following negative statements: “planting of shea trees would attract birds which destroy crops in farms” ($\bar{x} = 3.16$) and “shea trees would compete with crops when panted in the farm” ($\bar{x} = 3.07$).

On the other hand, respondents had unfavourable attitude towards “domestication of shea trees because of limited knowledge on shea trees propagation” ($\bar{x} = 2.86$), “lack of planting materials and clear market for shea products” ($\bar{x} = 2.72$), “insufficient awareness on the need to plant and manage wild fruit trees” ($\bar{x} = 2.14$) and “long gestation period to fruiting” ($\bar{x} = 2.06$). These finding suggests that the respondents in the study area had favourable attitude towards most of the issues bordering on the domestication of shea trees cultivation. Thus, inspite of the fact that farmers are not planting shea trees, many farmers seem to know it values. In this study, specific issues which attracted least unfavourable attitude and probably hindering the domestication of shea trees were long gestation period to fruiting and insufficient awareness on the need to plant and manage wild trees. This suggests the need for development of more improved short variety and awareness.

Factors Influencing Willingness to Plant Shea Trees

The result of logit regression analysis in Table 4 revealed that sex, attitude, land ownership, educational level and marital status had significant positive relationship with willingness to plant shea trees. Sex significantly influenced the respondent’s willingness to plant shea trees on their farms. The finding suggests that the female respondents were more willing to plant shea trees in their farms than their male counterpart. This may be attributed to the dominance of women in the picking and processing activities of shea nuts in the study area. Thus, the result is an incentive to motivate women to invest in the planting of shea trees.

Table 3. Attitude of farmers towards domestication of shea trees cultivation

Attitudinal statements	Mean	Standard deviation	Remarks
Domestication of shea trees would provide my family with edible fruits especially at the time of food shortage.	4.01	0.71	Favourable
Cultivation of shea trees would serve as a good source of income.	4.21	1.12	Favourable
Propagation of shea trees has a lot of medicinal values.	3.05	1.07	Favourable
Planting of shea trees will provide shade in the farm and serve as a wind breakers.	3.75	0.84	Favourable
Growing of shea trees would provide family with butter for cosmetic purposes.	3.02	1.32	Favourable
Domestication of shea trees in the farms would provide fire wood, material for building and mortar making.	3.00	1.57	Favourable
Cultivation of shea trees takes so long to fruit.	2.01	1.38	Unfavourable
Planting of shea trees would attract birds which destroy crops in the farms.	3.16	0.42	Favourable
Shea trees compete with crops when planted in the farms.	3.07	1.02	Favourable
There is limited knowledge on shea trees propagation.	2.86	0.58	Unfavourable
Insufficient awareness on the need to plant and manage wild trees affects domestication of shea trees.	2.14	1.03	Unfavourable
Lack of planting materials and clear market for shea products affects its domestication by farmers.	2.72	0.35	Unfavourable

Source: field survey, 2017

Table 4. factors influencing willingness of farmers to domesticate shea trees

Variables	Coefficients	Standard error	t-value
Constant	4.084127	2.221015	1.84
Education level	0.1153305	0.053493	2.16*
Age	0.392092	0.208107	1.88
Sex	0.1612436	0.0485504	3.32**
Marital status	0.0885658	0.0393267	2.25*
Farming experience	-0.4280819	0.2839193	-1.51
Attitude	0.1373837	0.0431573	3.18**
Land ownership	5.6700	1.8400	3.08**
Pseudo R ² = 0.42			
Log likelihood = 28.58			

Source: computed from field data, 2017

**P<0.01

*P<0.05

Attitude of farmers towards the domestication of shea trees positively influenced their willingness to plant shea trees; implying that if there is improvement in farmer's attitude, the probability of planting shea trees would increase as a result of their perception on the values of shea trees, which can lead to favourable attitude. Also, farm land ownership had significant positive effect on willingness to plant shea trees. Permanent land ownership would encourage farmers to allocate land resources to new practice and allow for long time meaningful investment and returns to scale on adoption of new practices such as planting of shea trees. This result suggests that farmers with permanent land holdings are more likely and willing to plant shea trees than the farmers who obtained their farmlands through other sources such as rent or lease.

Educational level of the respondents influenced willingness to plant shea trees. Farmers with formal education are expected to be more willing to plant shea trees than the uneducated farmers because they are more informed on the value of the trees. In a related study,

Obua *et al.* (1998) opined that education increases farmer's environmental awareness and appreciation of value of trees. Similarly, marital status of the respondents had significant positive effect on willingness to plant shea trees; indicating that married farmers were more willing to plant shea trees than the single farmers. This is likely because married people may be more conscious of trees investment for food security and income to sustain the family.

Conclusion

Based on the finding of the study, it was concluded that majority of the respondents are approaching old age. Most of the shea trees owned by the respondents grow naturally. The respondents had favourable attitude towards most of the issues bordering on domestication of shea trees. However, long gestation period and insufficient awareness on the need to plant and manage wild fruit trees elicited lowest unfavourable attitude. Sex, attitude, land ownership, educational level and marital status influenced willingness of the respondents to plant shea trees.

Recommendations

Youths, women and married couples should be encouraged by government to go into farming and shea trees cultivation in the study area in order to alleviate poverty.

Nigerian Institute for Oil-palm Research (NIFOR) should focus their research on the development of early maturing species for dissemination to farmers to reduce the gestation period of shea trees.

Agricultural extension agencies and its agents should create more awareness and educate farmers on the management, conservation and propagation techniques to encourage on-farm shea tree planting culture and agroforestry initiatives.

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