

Socioeconomic Determinants of Moringa Cultivation among Farmers in Jigawa State, Nigeria

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Abstract

The study examined the socioeconomic determinants of moringa cultivation among farmers in Jigawa State, Nigeria. A 3-stage sampling technique was used to select 120 respondents for the study, using a well-structured questionnaire. Findings revealed that the mean age of the respondents was 42 years, majority (73.3%) males, 79.3% married and 96.0% no formal education with average farming experience of 8 years and average monthly income of ₦15,770.83k. It was also found that most (60.3%) of the respondents sourced information on moringa cultivation from family/neighbours/friends while 5.9% sourced information through State agricultural development programme. The study revealed a low level of cultivation as most (46%) of the respondents cultivated between 0.5-1 hectares, classified as low cultivation, 34% cultivated between 1.1-2.0 hectare (medium level) while only 20% cultivated above 2 hectares considered to be high. Age, educational level, household size, extension contact and income of the respondents were found to influence the cultivation of moringa. Of these factors, educational level, farming experience and income were considered more influential with coefficients of 3.394, 2.098 and 22.062 ($p < 0.05$). The major constraints to moringa cultivation were inadequate capital (mean=2.37), unfavorable government policies (mean=2.17), poor harvesting and processing techniques (mean=1.99), under pricing by middle men (mean=1.92). It is concluded that age, educational level, household size, extension contact and income of the respondents were socioeconomic determinants of cultivation of moringa and therefore recommended awareness campaign and advocacies on radio, ADP offices and through farmers groups to help raise the awareness of the importance of cultivation of moringa.

Keywords: Determinant, Moringa, Cultivation, Socioeconomic, Jigawa

Introduction

Worldwide Moringa (*Moringa Oleifera*) is one of the most useful plants with one of the highest nutritional contents of any plant known (Lowell and Caroline, 2017). It is a fast-growing, drought-resistant tree, grown throughout the tropics, multipurpose in nature, and usually called the Miracle tree for good reasons. Common names include Moringa, drumstick tree, from the appearance of the long, slender, triangular seed pods, horseradish tree, from the taste of the roots which resembles horseradish, ben oil tree or Benzoil tree, from the oil derived from the seeds. It is use for human food, livestock forage, medicine, dye, and water purification. *Moringa oleifera* tree has been called the tree of life in many cultures around the world, including Nigeria. It has various local names in Nigeria; its names include "Ewe Igbale" in Yoruba, "Zogelle" in Hausa and "Idagbomunonye" in Igbo (Agriculturenigeria, 2017).

Despite huge earning from oil proceeds, Nigeria remains largely an agrarian economy with agriculture accounting for about 50 per cent of employment and among crops like; cocoa, cashew, palm oil, rice, cassava and soya bean, one other major cash crop that has huge potentials to boost farmer's income, the economy and create more jobs is moringa (The sun, 2016). Over the years moringa plant family has continue to flourish, as many farmers seize opportunity it offers for them to earn a living since it has enormous benefits for mankind (Daily Trust, 2017). It can tolerate

a wide range of soils and rainfall conditions, reach 3m in height within first 10 months after planting, about 1000 trees can conveniently occupies an hectare of land for quick flowering and fruiting (Lowell and Caroline, 2017). It has an incredible natural properties and one of the World's most valuable plants, at least in humanitarian terms and commercial purposes promoting convenient environment and sound economic development at all instances. It has high nutritional and pharmacological properties, for purifying and cleaning water.

Moringa has direct impact on health, nutrition, agriculture, water, sanitation, biodiversity and environment. It can respond to the environmental and financial sustainability, realism, and results, innovation, biodiversity, education and awareness. It is a gift of nature, a pure magic natural agro-biodiversity able to save billions of thirsty people in the world with a better health and sanitation. Moringa is an ideal plant to start indoors, in once own backyard easily (Moringafarms, 2016).

Following its export recognition, non-profit and international development agencies have spent millions of dollars to encourage people across the African continent to grow and use moringa (Lowell and Caroline, 2017). The crop is being used by pharmaceutical, perfumery, trado-medical practitioners, and food industries as its leaves and other parts are useful as medicine for treatment of ailments. Looking at the in-depth health benefits of

Moringa leaves, stem, root, and seeds, scientific studies (Lowell and Caroline, 2017) have shown that it contains specific antioxidants and health promoting ingredients that offer palliatives to malnutrition, hunger and diseases. The early leaves are edible and are commonly cooked and eaten like spinach or used to make soups and salads. It's rich in many vitamins, including Vitamin A, several forms of Vitamin B, Vitamin C, Vitamin D and Vitamin E (Lowell and Caroline, 2017).

Being one of the world's most nutritious crops, the leaves have more beta-carotene than carrots, more protein than peas, more vitamin C than oranges, more calcium than milk, more potassium than bananas, more iron than spinach (Moringafarms, 2016). There are many reasons to grow Moringa, even if just a single tree. Gram for gram, Moringa can have three times the potassium you would find in a banana, four times the vitamin A found in a carrot, and seven times the vitamin C found in an orange. Moringa is also rich in minerals, vitamins, essential amino acids, phytochemicals, vegetable proteins, anti-oxidants, anti-inflammatory agents, and carbohydrates (Moringafarms, 2017). Moringa tolerates a wide range of environmental conditions. It grows best between 25 to 35°C, but will tolerate up to 48°C in the shade and can survive in 98 per cent of states in Africa (Nigeria inclusive). This adaptable tree prefers a well-drained sandy loam or loamy soil, survive clay except under prolonged flooding and the tree tolerates a soil pH of

5.0 (Solomon, 2012). Moringa Oleifera seeds must be actively promoted and harvested on a large scale in developing countries, especially in the sunny hot areas like the Jigawa State, North West, Nigeria.

The general objective of this study is to assess the socioeconomic determinants of moringa cultivation among farmers in Jigawa State, Nigeria. The specific objectives are to: (i) describe the socioeconomic characteristics of the moringa farmers; (ii) examine the level of moringa cultivation among the respondents; (iii) determine the factors influencing the cultivation of moringa among the respondents; and (iv) identify the constraints militating against the cultivation of Moringa among farmers in the study area.

Materials and Methods

The study was conducted in Jigawa State Nigeria. Jigawa State is one of thirty six states that constitute Federal Republic of Nigeria. It is situated in the North-western part of the country between latitudes 11.00°N to 13.00°N and longitudes 8.00°E to 10.15°E. It has a total land mass of approximately 22,410 square kilometers with a population of 4,348,649 people (National Population Commission, 2006) while the estimated population in 2014 was 5,372,754 at 2.9% rate of population growth. It is bordered on the West by Kano State, on the east by Bauchi State and Yobe State and on the North by Katsina State and Republic of Niger. Farming is among the

major occupation of the people who are predominantly Hausa/Fulani. The topography is characterized by high land areas which is almost 750meters. Soil tends to be fertile ranging from sandy-loamy with many pockets of *fadama* and alluvial plains suitable for the cultivation of rice, sugar-cane, millet, maize, vegetables and sorghum etc.

The population for the study comprised of all the Moringa farmers in Jigawa State under the four ADP Zones. A three stage sampling procedure was used for the study. The first stage involved random selection of three Local Government areas from each of the four ADP zones in the State. The second stage was a random selection of four (4) communities from each of the selected Local Government area. At the third stage, ten (10) moringa farmers were randomly selected from each of the community from the list of the farmers obtained from the State Agricultural Development Programme to make a total sample size of 120 respondents for the

study. Data obtained were described using frequency counts, percentages, mean, standard deviation and charts while Chi-square statistics was used to make deduction from the study.

Results and Discussion

Socioeconomic characteristics of the respondents

Results in Figure 1 revealed that the mean age of the respondents was 42.1 years with majority (73.3%) were males while only 26.7% were females. This suggests that the respondents were still within their active and productive ages. This finding affirms the report of Umar *et al.* (2006) which stressed that most of the active farmers in the rural area were within the age range of 40-50 years. Findings also revealed that majority of the respondents are married (79.3%) with no formal education (96.0%). This implies that most of the respondents are non literate and this could have negative effect on their adoption of technologies of moringa cultivation.

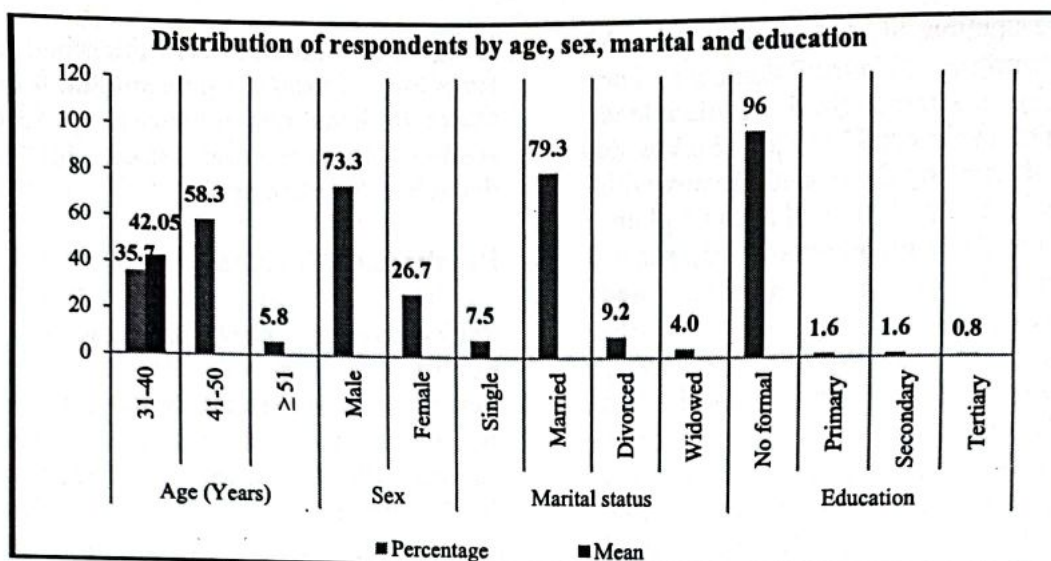


Fig 1: Distribution of respondents by age, sex, marital status and education
Source: Field survey, 2017

Results in Table 1 showed that among the respondents, 15.8% of them have household size of 1 – 5 person, majority (82.6%) have household size of 6 – 10 while only 1.6% has above 10 person with mean household of 7 person. This finding suggests that larger household would have a comparative advantage of family labour than the small household. In a related study, Umar *et al.* (2013) reported that majority of the rural farmers in Niger State had family sizes of 6-10 persons. Further results in

Figure 2 revealed that majority (93.4%) of the respondents had about 10 years of farming experience, 5.8% had between 11-20 years of farming experience while less than 1% had above 20 years of farming experience with mean farming experience of 8.4 years. Also, majority (77.6) of the respondents were rarely visited by the extension experts with most (52.5%) of them belongs to one form of cooperative or the other.

Table 1: Distribution of respondents by household size, farming experience, extension visit and membership of cooperative

Variables		Percentage	Mean
Household size	1-5	15.8	7.25
	6-10	82.6	
	≥ 11	1.6	
Farming experience	≤ 10	93.4	8.4
	11-20	5.8	
	≥ 21	0.8	
Extension Visit	Weekly	8.3	
	Monthly	5.8	
	Quarterly	7.5	
	Yearly	0.8	
	Rarely	77.6	
Membership of cooperative	Yes	52.5	
	No	47.5	

Source: Field survey, 2017

Results in Figure 2 showed that the mean monthly income of the respondents from moringa plantation was N15,770.00 with majority (88.8%) earning up to N20,000 monthly, 4.3% earning between 21,000-30,000 monthly while only 2.4% earning above N30,000 monthly. This suggests that moringa plantation is lucrative if properly harness by the farmers to augment their income.

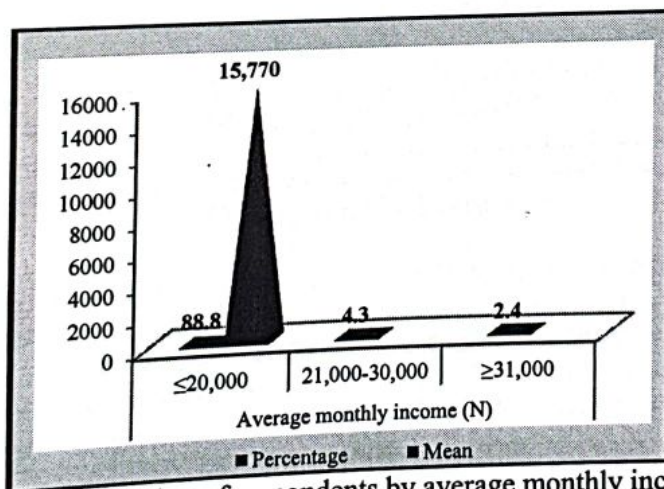


Fig. 2: Distribution of respondents by average monthly income
Source: Field survey, 2017

Results in Figure 3 revealed that most (60.3%) of the respondents sourced information on moringa cultivation from family/neighbours/friends, 18.2% sourced information through radio, 7.4% sourced from television. Also, some 3.8% of the respondents sourced their information through Non-governmental organization while 5.9% and 4.4% sourced information through State agricultural development

programme and agric show respectively. This implies that farmers get more information about agriculture mostly through their close pals and also because radio is relatively affordable to them compared with other means of mass media and also radio at all-time does not require electricity to function making it easily accessible to the farmers.

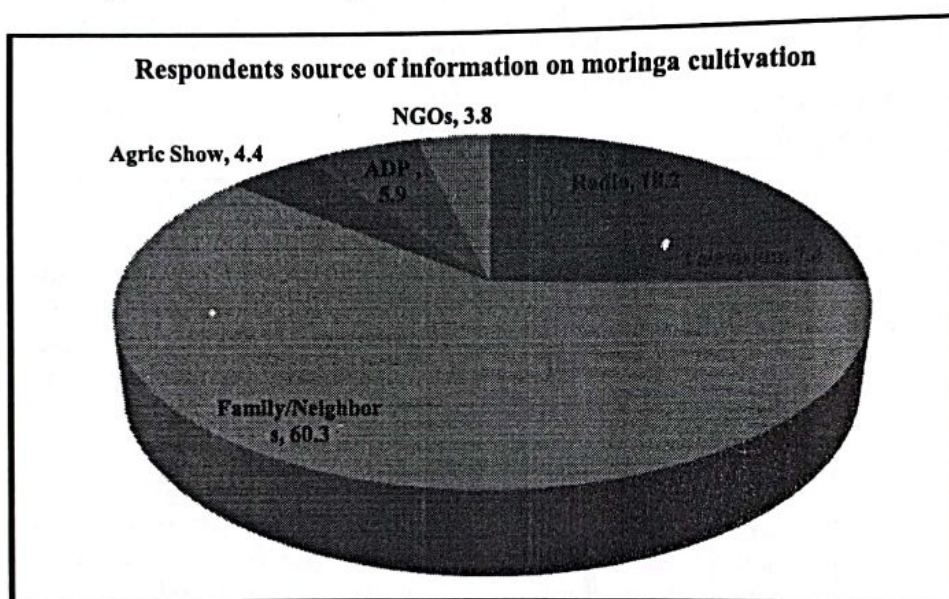


Fig. 3: Distribution of respondents according to their sources of information on moringa
Source: Field survey, 2017

Level of moringa cultivation among the respondents

Figure 4 revealed that most (46%) of the respondents cultivated between 0.5-1.0 hectare of moringa plant and are classified

as low cultivation, 34% cultivated between 1.1-2.0 hectare of moringa as medium level while only 20% cultivate above 2.0 hectares of moringa and considered as high level of cultivation.

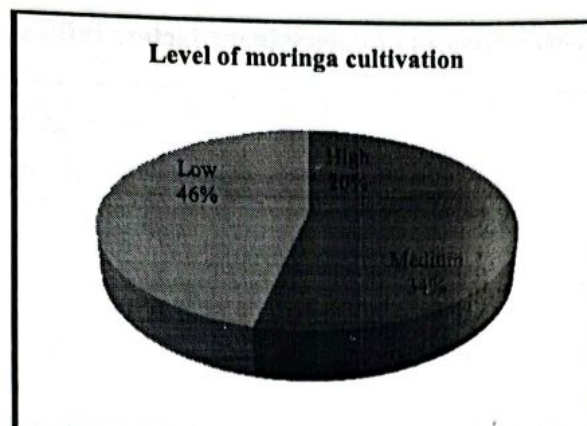


Fig. 4: Distribution of respondents according to level of moringa cultivation

Source: Field survey, 2017

Factors influencing the cultivation of moringa among the respondents

The results of the logit regression analysis in Table 2 revealed that age, educational level, household size, extension contact and income of the respondents are positive and significant to the cultivation of moringa at varying degree of significance. The coefficient for age (4.086) is positive and significant at 10 percent level of probability. This suggests that as age of the respondents' increases, the probability of cultivating more moringa plant increases. The coefficient of educational level, farming experience and income are 3.394, 2.098 and 22.062 were positive and significant at 5 percent level of probability. This implies that as the educational status of the farmers increases there is likelihood that the cultivation of moringa plant among

the respondents would also increase considering the fact education enhance the farmers capacity to learn and adopt new innovation that would probably increase their income. Also, the positive signs implied that as farming experience increases, the tendency in cultivation of more moringa plots of land by the farmers. It is probable that past experience farmers had, with good performance may encourage increased cultivation and adoption of new technologies moringa plantation. The number of extension contact could also increase the rate of adoption of moringa plantation among the farmers. This is because the farmers are more likely to receive more useful information on moringa cultivation from the extension agents and likewise as their income increases the adoption rate also increases.

Table 2: Results of the logit estimates of determinant factors influencing the cultivation of moringa plant

Factors	Coefficient	Standard Error	t-value
Age	4.086*	0.0742	0.021
Education	3.394**	0.0329	0.000
Farming experience	2.098**	1.0642	0.004
Household size	0.162	0.0556	0.453
Membership of cooperative	0.625	0.7469	0.5125
Extension contact	2.397*	0.2045	0.014
Income	22.062**	1.6835	0.002
Constant	0.0174	4.0246	2.135
R ²	0.5125		

**coefficient is significant at 0.05

*coefficient is significant at 0.10

Source: Data analysis, 2017

Constraints of the Farmers to Moringa Cultivation

Table 3 indicate that inadequate capital (mean=2.37), unfavorable government policies (mean=2.17), poor harvesting & processing techniques (mean=1.99), under pricing/middle men (mean=1.92) and theft and other social vices (mean=1.86) and lack of up to date research on plant/availability of findings (mean=1.75) were considered severe constraints and ranked 1st, 2nd, 3rd, 4th, 5th and 6th respectively. However, others include lack of sustainable/reliable market outlet for the plant (mean=1.18), problems of nomads (mean=1.12) and lack of advocacy on the moringa management practices (mean=1.08) were also rated as being severe constraints by the respondents.

Conclusion and Recommendations

The study concluded that age, educational level, household size, extension contact and

income of the respondents were determinants of cultivation of moringa in the study area. Of these factors, educational level, farming experience and income were considered most influential. However, the major constraints to the cultivation of moringa were lack of capital to go on commercial farming, unfavorable government policies, poor harvesting and processing techniques and underpricing by middle men. The study therefore recommended awareness campaign and advocacies must be done on radio, ADP offices and through farmers groups and cooperatives to help raise the awareness of the importance of commercial cultivation of Moringa, provision of sustainable and reliable market outlets and up to date technologies on harvesting and processing of Moringa through effective advisory services and capacity building services.

Table 3: Constraints to moringa Cultivation

Constraints	Mean	Ranking
Inadequate capital	2.37	1 st
Lack of advocacy on the moringa management practices	1.08	9 th
Inadequate of extension services/SMS	1.05	10 th
Problems of Nomads	1.12	8 th
Unfavorable environment(Government policies)	2.17	2 nd
Lack of sustainable/reliable market outlet for the plant	1.18	7 th
Underpricing/middle men	1.92	4 th
Up to date storage technologies	1.69	1 st
Harvesting & processing technologies	1.99	3 rd
Theft & other social vices	1.86	5 th
Pest/diseases infestations on field	1.04	11 th
Lack of up to date research on plant/availability of findings	1.75	6 th

Source: Field survey, 2017

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