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COMPARATIVE STUDY ON THE POTENTIAL USERS OF *MORINGA oleifera* WATER PURIFICATION AND INSTITUTIONAL FACTORS OF FARMERS IN KADUNA STATE, NIGERIA

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Abstract

This study examined the potential users of *moringa oleifera* as water purifier on the socio-economic impact of the farmers in Kaduna state. Data were collected with the aid of structured questionnaire from 50 respondents. The data were analyzed using descriptive statistics and logit regression model. The results indicated that, 50% of the respondents attended Arabic school,16% had secondary school, while 34% attended other schools . It was observed that 84 percent were married and average household size between 13-18 has percentage of (50%), this implies that, the larger the size of the family the more work force available for farm activities.Hence,household have positive significant role in farming activities. Therefore, use of *Moringa olefeira* as water purifier is higher among the large household than the small-sized household.. This may be due to the fact that there is need to reduce the cost of acquiring convectional chemicals which have adverse effect on the health of the people and which has claimed the lives of numbers of people. The result also revealed that, 100 percent were fully involved in *Moringa oleifera* farm operation and which actually enhanced their interest in acquiring innovation introduced to them.95% are potential users, while 5% were not potential users. Also it was also noted from the result that some factors also acted as buffers for embracing this technology, such factors were household size, marital status, education, and extension contact and credit facility. The study therefore recommends that farmers should be involved in various workshops which will facilitate their moral in accepting a particular innovation and more extension personnel should be employed to disseminate innovation to the farmers especially in the rural areas.

Key words: *Moringa olefera*, , water purifier, factors, buffer, facilitate.

Introduction

Moringa oleifera (Family:Moringaceae) is cultivated across the tropics and used for a variety of purposes (Jahn, 1986). Its seed powder is a good water purifier; and contains polyelectrolyte, which constitute active ingredients in water treatment. Aqueous extract of mature seeds from trees and shrubs of Moringaceae family are effective in clarifying turbid and waste water in tropical countries (Jahn, 1986), especially during rainy season. Muyibi and Evison (1995) noted that *M. oleifera* seeds have been used in the treatment of hard water, and proved that hardness removal efficiency of *M. oleifera* increased with increasing dosage. *Moringa* seed powder is a natural alternative to imported alum (aluminum sulphate, the conventional synthetic coagulant) used in purifying turbid water in fish culture enclosures (earthen ponds, farm dams and irrigation canals). It is obtainable locally at a fraction of the cost of alum in many countries, simple to use and cheap to maintain (Jahn, 1986; Ndabigengesere and Nasarasiah, 1998).

Methodology

Study area

The study was carried out in Bomo village, Sabon gari local government area, located between latitude 118 11º north and longitude 070 38º East at 675 meters. The hottest months are March-April, while the coldest months are December-January. Rainfall is heaviest in the south and decreases northwards with an annual mean rainfall varying between 942mm and 1000mm which last for six months (May-October) (NARERLS, 2002). Soil of the area is characterised by ferrogenous tropical soils formed on drift material (Klinkenberg and Haggins, 1968).

The surface soil is fine sandy loam, prone to capping and poor structure. Its physical structure has been described by Kowal (1972). In this area trees like sea butter, locust bean predominate, while in the north and northwest, Baobab, silk cotton and date palm are predominant. The people in this area engage in agricultural production activities. The main crops which are grown include maize, millet, rice, groundnut, yam and sugar cane.

Primary data were used for this study. These were collected with the aid of structured questionnaire. The data were collected from 50 respondents in the study area.

Analytical techniques

Descriptive statistics

This was used to describe socio-economic characteristics of the farmers. It includes frequency count and percentages. Also, logit regression was used to identify institutional factors which enhanced the usage of *Moringa oleifera* water purification. The probability of a respondents using *Moringa oleifera* for purification is determined by an underlying response variable that reflected economic potential of the respondents. The underlying response variable y* in the case of binary choice is defined by the multivariate logit regression relation:

Results and Discussion

Results in Table 1 shows that *Moringa oleifera* farm operation were made up of men; this may be due to the fact that, custom and religious belief have impact on the various activities on the men and which does not permit the female to engage in farming activities. Also, based on this belief the male shouldered the total responsibility of the entire family. Table 1 further revealed household size between 13-18 has percentage of (50%), this implies that, the larger the size of the family the more work force available for farm activities household have positive significant role in farming activities. Therefore, use of *Moringa olefeira* as water purifier is higher among the large household than the small-sized household.. This may be due to the fact that there is need to reduce the cost of acquiring convectional chemicals which have adverse effect on the health of the people and which has claimed the lives of numbers of people. Also, based on this findings majority of the farmers involved in this farming activities were married and actively involved in moringa plantation as source of their livelihood, while 16% were single. The result indicated that most of the farmers had one form of the education to another and which have positive impact on the institutional factors of the farmers to use a particular innovation. The result indicated that, (50%) had Arabic education, while (50%) had other forms of formal education. This implied that, education have positive impact in accepting a technology, because it would improved their moral by some level of educational achievement.

Table 1: Socio-economic characteristics of *Moringa* farmers

Variables	Frequency	Percentage (%)
Gender		
Male	50	100
Female	0	0
Age		
20-29	12	24
30-39	8	16
40-49	16	32
50-59	11	22
60 years and above	3	6
Household size		
1-5	8	16
6-11	7	14
13-18	25	50
None	10	20.
Marital status		
Married	42	84
Single	8	16
Educational level		
Primary	4	8
Secondary	8	16
Tertiary	3	6
Arabic	25	50
Other	10	2

Table 2: Potential users and non-users

Variables	Frequency	Percentage
Users	45	90
Non-Users	5	10
Total	50	100

Institutional Factors of potential users of *Moringa oleifera* seed powder

Results presented in Table 3 showed the factors that determine the uses of *Moringa oleifera* in the study area. It was revealed that the following variables included in the model were significant. These variables were household size, education, and extension contact and credit facility. Education was positive and significantly influential to the use of *Moringa oleifera* for water purification. This implied that as farmers acquired more education the probability of using this method would also increase. This is indicated that there is a positive relationship between education and users behaviour.

The coefficient obtained for extension contact was positive and significant at 1 percent. The implication of this is that if farmers have more access with the extension agent. There is probability that users would increase. This implied that dissemination of information would be facilitated by the stakeholders and information will be made available .The

coefficient (0.572) for amount of credit was positive and significant at 5% level of probability. If, more credit facilities are provided for the farmers, the production capacity would be enhanced and more employment opportunities will be generated.

Table 3: Determinant factors of potential users of *Moringa oleifera*

variable	*Coefficients*	*Standard Error*	*t Stat*	*b/st Er*
Extension	0.005743	0.056472	-0 54327	4.243**
Marital	-0.02625	0.034306	-0.76526	5.14484
Educ	0.016137	0.049656	0.324977	3.23**
Household	0.042289	0.057306	0.737952	2.44**
Credit	0.57298	0.087922	-1.27359	3.62**
Income	-0.09857	0.032976	-2.98909	8.4045

*** = P < 0.01 ** = P < 0.05 * = P < 0.10

Conclusion

The result of this finding revealed that, credit facilities should be provided for the farmers to enhance their purchasing power to acquire input facilities which will energise production capacity. Also, the farmers should be educated on various workshops and seminars which will promote their interest on various farming activities to reduce poverty in rural areas in economy development.Finally, more extension personnel should be involved to participate in this workshops and training to heighten their moral on various farming technologies.

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