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Awareness Level and Workshop Training on the Use of *Moringa oleifera* Seed Powder for Water Purification among Farmers in Kaduna State, Nigeria.

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Abstract

This study investigated the awareness level and workshop training on the use of *Moringa oleifera* as water purifier among the farmers in Kaduna State. Data were collected with the aid of structure questionnaire from 50 respondents. The analysis of data was done with descriptive statistic and regression model which capture the data accurately. The result showed that, 100% of the farmers that participated in the training workshop were male; this implied that religious activities do not encourage the women in farming and to attend any organisation. The result further showed that, the major determinant factors were source of information, farm experience, co-operative, occupation and education. However, four (4) out of these factors were significance at 5%. The result indicated that education is significance at 5%, it implied that people were enhanced by the workshop trainings based on the level of educational background which they attained in their various schools. The result showed that, co-operative membership is significance at 1%. This implied that as a member of cooperative society it facilitated the accessibility of an individual toward obtaining loan in the bank and other lending financial sector. The result indicated that, before the commencement of the training workshop 96% of the participants were not aware about the use of *moringa oleifera* seed powder for water purification. However, but at the end of the training workshop (100%) of the participated farmers were aware and convinced on the use of this technology for water purification. This implied that, demonstration of an innovation has been confirmed to be an effective measure of enhancing farmers' interest and disseminating technical information to them. The result revealed that source of information has being a part of concern in the aspect of disseminating innovation. This implied that, every stakeholder's extension workers, researchers should be motivated financial in order to discharge their responsibility efficiently to the targeted group (Farmers) on various innovations.

Keywords: Workshop Training, Technical Information, Determinant Factors, Disseminating.

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Introduction

Drumstick (*Moringa oleifera*) belongs to the family *Moringaceae* which is a single genus family of shrubs and trees cultivated across the whole of the tropical belt and used for a variety of purposes (Jahn, 1986). The dry seed suspension is known to be a natural coagulant and coagulant aid (Jahn, 1979-1988; Folkard, *et al.*, 1986-1988; Kaser, *et al.*, 1990; Sani, 1990; Bina, 1991). *Moringa oleifera* is a potential alternative to aluminium sulphate for water treatment in rural and urban areas. Nigeria is endowed with abundant water resources, these resources are mainly in the form of surface and groundwater, both of which are greatly influenced by rainfall. Despite the abundant water, access to clean drinking water is the major problem in the country. The Institutions tasked to provide clean drinking water cannot manage because of various factors such as limited funds, poor infrastructure and a rapid population increase. According to the World Health Organization (WHO), an estimated 67% of Nigerians use water that contains suspended matter such as solid materials, bacteria and other microorganisms. This water is the source of diseases such as cholera, typhoid, dysentery and diarrhoea, which have claimed many lives countrywide (Nyumbu, 1996).

In the Sudan, dry *Moringa oleifera* seeds are used in place of alum by rural women to treat highly turbid Nile water (Jahn, 1986). In Northern Nigeria, the fresh leaves are used as a vegetable, roots for medicinal purposes and branches for demarcation of property boundaries and fencing. Studies by Eilert *et al.* (1981) identified the presence of an active antimicrobial agent in *Moringa oleifera* seeds. The active agent isolated was found to be 4L-rhamnosyloxy-benzyl isothiocyanate, at present the only known glycosidic mustard oil. Madsen *et al.* (1987) carried out coagulation and bacterial reduction studies on turbid Nile water in the Sudan using *Moringa oleifera* seeds and observed turbidity reduction of 80-99.5% paralleled by a bacterial reduction of 1-4 log units (90-99.9%) within the first one to two hours of treatment, the bacteria being concentrated in the coagulated sediment. The techniques for treating water involve the removal of the solid matter; generally done using coagulants that are added to the raw water.

Aluminium sulphate (Alum) is generally used to treat water. However, aluminium sulphate treated water is restricted to urban areas and at times not all areas have access to this water due to high demand caused by increase in population. For rural poor populations, this water is out of reach. The challenge facing the water sector today is how to give more people access to clean drinking water by cost effective means, especially the rural poor who cannot afford any water treatment chemicals, without affecting the health of their environment. The introduction of *Moringa oleifera* seed powder not only provides alternative materials for treating water, but can also improve the living standards and welfare of the rural and urban people through provision of employment, extra income, food and clean water. Also, earlier studies on chemical coagulants in water purification have not taken into cognizance the adverse effect of this method on the people, while the *Moringa oleifera* is cheap and viable alternative to expensive conventional chemicals. This study seeks to accord this uniqueness an attention and hopes that discoveries will help in improving the economic position of the farmers and their health.

Materials and Methods

This study was conducted in Samaru - Zaria, Northern Nigeria. Samaru - Zaria lies on Latitude 11°11' N, Longitude 7°35'E, and altitude 686 m above mean sea level, and is located in the Northern Guinea Savannah ecological zone of Nigeria with a semi-arid climate. It has three distinct seasons which consist of a hot dry season which spans from March to May, warm rainy season which spans from June to early October, and the cool dry (harmattan) season which spans from November to February. The average relative humidity is about 36.0% during the dry season and 78.5% during the wet season, and the average minimum and maximum temperatures are 15.6 and 38.5°C, respectively. The on-set of rains in the area is in May, but effective rainfall begins in late June and falls till early October, with a peak in August. The mean annual rainfall depth is 1150 mm, with an average peak of 650 mm in August, as obtained from the Meteorological Office of the Institute for Agricultural Research (I.A.R). The cool-dry (harmattan) and hot dry seasons Soil of the area is characterised by ferruginous tropical soils formed on drift material (Klinkenberg and Haggins, 1968). The soils of Samaru - Zaria are mantle of residues overlain by Aeolian deposits, classified as alfisols, based on the USDA (1975) classification (Aremu, 1980). 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 that 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. Primary data were used for this study. Descriptive statistics was used to describe socioeconomic characteristics of the farmers and level of awareness. It includes frequency count and percentages. Logit regression was used to identify awareness factors. The probability of a respondent awareness about the techniques is determined by an underlying response variable that the true socio-economic status of the respondents. The underlying response variable y^* in the case of binary choice is defined by the multivariate logit.

Water purification process

This treatment also removes 90-99% of bacteria contained in water. Using *Moringa* to purify water as chemicals are very expensive and dangerous to humans and its environment. This illustration shows how to purify 20 litres of water, you can increase the proportion to treat desired volume of water.

- Remove the wings and brown seed coat and discard any seed kernels that has dark spots or any other signs of damage.
- Pound the kernels to a fine powder.

- Add 2 grams (2 small spoons) of powder to one cup of clean water pour into a bottle and shake for 5 minutes.
- Filter the solution through a clean cloth into the bucket of dirty water that is to be treated.
- Stir the water quickly for 2 minutes and slowly for 10 to 15 minutes (do not use metal implements).
- Leave the bucket undisturbed for one hour or until the water becomes clear and the impurities have sunk to the bottom.
- Filter the water through a clean cloth
- Boil the water before drinking.

Results and Discussion

Results in Table 1 showed that, 100% of the participants that attended the workshop training were mainly male. This implied that the female are not given opportunity to attend training due to religious belief. Result in Table 1 indicated that, (32%) participant were between the range of 50-59years. This means that, age is very important factor to be considered when organising a particular training workshop because it enhanced their readiness and interest to accept an innovation brought to them. Table 1 further revealed modal household size 6-11 has percentage of (48%), this implies that, the more the members of a particular household the more hands for farming activities. Also, based on this study, 90% of the farmers involved in this workshop training were married and full farmers. The result indicated that most of the farmers had one form of the education to another and which enhanced their interest in attending the workshop training. The result indicated that, (36%) had primary education, (28%) had secondary, while (36) had other forms of formal education. This implied that, education inspired people's interest in workshop training.

Conclusion and Recommendations

The result of this finding actually put more light on hindrances facing the acceptability of an innovation in the rural areas. Most of the respondents claimed that there was no adequate source of information on various innovations in their villages. This implied that the farmers are being marginalised and discouraged, due to lack of adequate information on innovation. Also based on this finding, it was discovered that land tenure system has being a serious problem facing the farmers in this area and which is affecting farming activities in this study area. Therefore government should improve the welfare of the farmers especially in the aspect of given land assistance to them for crop production. Also, amenities such as, electricity, water and various information networks should be made available for the farmers.

References

- Aremu J.A (1980). Effect of different cultivation techniques on infiltration. Unpublished M.Sc. Thesis of the Department of Soil Science submitted to the Postgraduate School of the Ahmadu Belo University, Zaria, Nigeria.
- Bankole, O. (2001). Practical Agricultural Communication, pp.37, 40 and 76.
- Bina B. (1991), Investigations into the use of natural plant coagulants in the Removal of bacteria and bacteriophage from turbid waters. PhD. thesis, Univ. of Newcastle upon Tyne.
- Eilert U., Wolters B. and Nahrstedt (1981): The antibiotic principle of *Moringa* and *Moringa stenopetalla*. *Planta Medical* 42, 55-61.
- Folkard G. K., Sutherland J. P. and Grant W. P. (1986-1988), Optimisation of the use of natural coagulants for water purification. Tech. Rep. No. R4254. University of Leicester.
- Jahn, S.A.A., Jahn Samia-Al Azh-Aria and Al-Azharia, J.S. 1986. Water treatment with traditional plant coagulant and clarifying clay. Record 10 and 26 CAB Abstract 1987- 1989.
- Jahn, S.A.A. 1986, Monitored water coagulation with *Moringa oleifera* seeds in Village household. *Journal of Analytical Science* 1: 40-41.
- Jahn, S.A.A., Jahn Samia-Al Azh-Aria and Al-Azharia, J.S. 1986. Water treatment with traditional plant coagulant and clarifying clay. Record 10 and 26 CAB Abstract 1979- 1988.
- Jahn, S.A.A. 1986, Monitored water coagulation with *Moringa oleifera* seeds in village household. *Journal of Analytical Science* 1: 40-41.
- Kowal and Knabe, (1992). An agroclimatical Atlas of Northern states of Nigeria with explanatory notes. Ahmadu Bello University Press. ABU, Samaru Zaria. Nigeria 117p.
- Madsen M., Schlundt J. and El Fadil E. Omer (1987), Effect of water coagulated by seeds of *Moringa oleifera* of bacterial concentrations. *J. Trop. Med. Hygiene* 90, 101-109.13
- Nyumbu, I. L. (1996), *Environmental Support Programme*, Position Paper on the Water Sector, MENR/IUCN, Lusaka.
- Voh, J. P. (2003), Extension Communication Method. Ahmad Bello University, Zaria.
- Voh, J. P (1979). An explanatory study of factors associated with adoption of recommended farm practices among Giwa Farmers. *Samaru Miscellaneous Papers*, 73. Institute for Agricultural Research, Ahmadu Bello University, Zaria.
- Weber W. Jr (1972), *Physicochemical Processes for Water Quality Control*. Wiley Interscience, New York.
- World Health Organization (1984) *Guidelines for Drinking Water Quality: Vol. I; Recommendations*. World Health Organisation.

Tables**Table 1:** Socio-economic characteristics of respondents

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	9	18
6-11	24	48
13-18	6	12
None	11	22
Marital status		
Married	45	90
Single	5	10
Educational level		
Primary	18	36
Secondary	14	28
Tertiary	4	8
Arabic	8	16
Other	6	12

Table 2: Awareness level of the farmers before the introduction of the technology.

Respondent	Frequency	Percentage
Number of awareness	2	4
Number not aware	48	96
Total	50	100

Table 3: Awareness level of the farmers after the workshop training

Respondent	Frequency	Percentage
Number of awareness	50	100
Number not aware	-	-
Total	50	100

Table 4: Determinant Factors of awareness on the use of *Moringa oleifera* seed powder

	Coefficients	Standard Error	b/St.Er
Inform source	-0.331	0.562	- 0.5889
Education	0.532	0.243	2.18**
Coop	0.181	0.024	7.541***
FarmExp	0.282	0.041	6.878***
Occupation	0.485	0.644	0.7531
Age	0.072	0.029	2.48**
Land tenure	-0.241	0.424	-0.568

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

Figure 1: Workshop training

Demonstration of the technology to the farmers

Figure 2: The filtration of *Moringa oleifera* seed powder water by a research officer