UTILIZATION AND HEALTH BENEFITS OF *Moringa Oleifera* AMONG RURAL HOUSEHOLDS IN KOGI STATE NIGERIA

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ABSTRACT

This study examined utilization and health benefits of *Moringa oleifera* among rural households of Kogi State Nigeria. A sample size of 103 rural households was obtained through a multistage sampling technique. Data were collected using structured questionnaires, data collected were analyzed using descriptive statistics (frequency, percentages and mean) and logistic regression. The result indicates that use for cooking tea ($\overline{X}$ =2.62) ranked 1st, use for Vitamin A, C and minerals ($\overline{X}$ =2.50) ranked 2nd. This shows that Moringa could be used as sources of income to household and can also beautifying environment. The perceived health benefits of Moringa oleifera revealed that household agreed with the following perceived benefits of Moringa oleifera. Regulation of high pressure ($\overline{X}$ =5.0) ranked 1st. Also, use for body pain ($\overline{X}$ =4.81), hypertension ($\overline{X}$ =4.81), and beautifies skin ($\overline{X}$ =4.81) ranked 2nd. Also, used in treatment of fever ($\overline{X}$ =4.79), use for stomach pain ($\overline{X}$ =4.69), use for treatment of diabetes ($\overline{X}$ =4.21) and use for treatment of cough ($\overline{X}$ =3.82). Factors affecting the utilization of Moringa Olifera showed that the coefficient of household (0.1647064) was positively significant at 5% level of probability, The coefficient of education at 1% level of probability. It was concluded that households in study area utilize Moringa for both ornamental and medicinal purposes. The study recommended that house hold should find alternative means of tackling pest and diseases associated with Moringa and extension agents should create awareness on other health benefit associated to the use of Moringa.
Key words: Moringa, Health benefit. Household

INTRODUCTION

Moringa oleifera (Lam) belongs to the family monogeneric shrubs and trees Moringaceae which includes thirteen (13) species of which *Moringa oleifera* is the best known and used. The remaining twelve species are well known: M. arborea, M. borziana, M. concanensis, M. drouhardii, M. hildebrandtii, M. longituba, M. ovalifolia, M. peregrina, M. pygmaea, M. rivae, M. ruspoliana and M. stenopetala. Originally from India, *Moringa oleifera* acclimatized in almost all the dry tropical regions of the world. *Moringa oleifera* is one of the most used woody resources because of its virtues. (Goudjinou, 2016).

According to (Goudjinou, 2016), the benefits of the use of *Moringa oleifera* powder leaf as a nutritional supplement in biscuits were confirmed. The enrichment of tamarind pulp by the Moringa can increase the protein content of the products and actively participate in the national program for nutrition. However, the success of an action to promote the consumption of local resources to combat malnutrition requires prior analysis of the traditional practices of the target population. Moringa oleifera has the potential to significantly add to rural household health benefits improve quality of life in Nigeria (Gadzirayi 2013). *Moringa oleifera* serve as a source of income to the number of people as several people have started nurseries to grow M. oleiferain large quantities can be diversified in order to generate income, reduce poverty and improve the health of people by proper nutrition. (Chopade *et al.,* 2012). *Moringa oleifera* has the potential of improving nutrition, boost food security, and foster rural development by enhancing and sustaining rural households as

well as supporting sustainable land use and care (Ahmad, 2014).

Health benefit of *Moringa oleifera* is limitless. It is used as a blood cleanser and blood builder helps in wound healing and boosts the immune system (Gadzirayi*et al.,* 2013).It modulates anemia, high blood pressure, diabetes, blood cholesterol thyroid, liver and kidney problems. It has strong anti-inflammatory properties ameliorating rheumatism, arthritis. It is effective against digestive disorders, diarrhea, ulcer or gastritis. *Moringa oleifera* is an anti-bacterium, antimicrobial and anti-viral agent; it is effective against urinary tract infection, typhoid, syphilis, dental carries and toothaches, fungus, thrush, common cold, HIV, worms, and trypanosomes. It is a detoxifying agent; it is effective against snake and scorpion bites. *Moringa oleifera* also prevents the growth of cysts, tumors and glands. It curbs other health complications such as diabetes, anemia and high blood pressure. Liver, kidney, stomach and thyroid problems can also

be prevented by taking this medicine. In traditional medicine, the leaves are used to treat ailments including malaria, typhoid fever, parasitic diseases, arthritis, swellings, cuts, diseases of the skin, genito-urinary ailments, hypertension and diabetes (Leone *et al.,* 2015). They are also used to elicit lactation and boost the immune system (to treat HIV/AIDS related symptoms) (Popoola and Obembe,2013), as well as cardiac stimulants and contraceptive remedy. For the treatment of these ailments, one can directly consume either raw and dried leaves, or the extract of an aqueous infusion (Leone et al., 2015).

Moringa oleifera is well known traditionally for the treatment of hepatotoxicity, rheumatism, venomous bites and also for cardiac stimulation (Soliman, 2013). In traditional medicine, the leaves are used to treat ailments including malaria, typhoid fever, diarrhea, parasitic diseases, arthritis, swellings, cuts, and diseases of the skin, genito-urinary ailments, hypertension and diabetes (Leone *et al.,* 2015).it is effective against urinary tract infection, typhoid, syphilis, dental carries and toothaches, fungus, thrush, common cold. Its strong antioxidant properties guard against skin cancer

and prostrate growth. It is very effective for treating arthritis, rheumatism and joint pain *Moringa oleifera* is a strong antioxidant, effective against prostrate and skin cancers, an anti-tumor and an anti-aging substance. (Prod *et al.,* 2012). *Moringa oleifera* leaves could practically wipe out malnutrition in the world. It is especially promising as a food source in the tropics because of the substantial or numerous health benefits realized by consumption of Moringa in situation where starvation is imminent (Srikanth, 2014). Despite the attributes of Moringa oleifera, however there is a death of the information of the plant in Nigeria. Household are not fully aware of the usefulness of *Moringa oleifera* to their health benefits, Owing to the increased interest in improving, maintaining health in a proactive and convenient approach household have been come more concerned about the nutrient, health and quality of food they eat. The study on effect of production and health benefit will contribute information to the partial existing knowledge on monriga with the aim of suggesting measures that could be useful to decision makers, programme designers and implementation as well as researchers and extension workers.This research will also contribute to sustainability by finding alternatives to conventional medicines. The outcome of this study is expected to indicate policy intervention that will improve rural household in order to enhance health Status especially among the moringa tree farmers. The specific objectives area to;

1) examine the level of utilization of *Moringa oleifera* among the rural households;

2) assess the perceived health benefits of *Moringa oleifera* and

3) determine the factors affecting *Moringa oleifera* among the rural households in the study area.

METHODOLOGY

The study was carried out in Kogi State. The State is in the middle belt of Nigeria. It is situated between Latitudes 6°33'N and 8°44'N and Longitudes 3°22'E and 7°49'E and has its capital in Lokoja. It has about 172,000 farm families, 70% of this population lives in the rural areas and they are engaged in crop production and animal rearing (Kogi State Government, 2010). Kogi State is the most centrally located of all the

states of the federation. It comprises the I gala, Ebira, Kabba, Yoruba and Kogi divisions of the former Kabba province. With a geological feature depicting young sedimentary rock and alluvium along the riverbeds, which promote agricultural activities' e.g. yam, cassava, maize, sorghum, groundnut, beans, palm oil and kernel. The maximum temperature in the state is 33.2oC and minimum temperature of 22.8oC annually. The State has two distinct seasons namely, the dry, which lasts from November to February and rainy that lasts from March to October each year respectively. The annual rainfall is between 1016mm to 1524mm. The State has estimated total land area of 29,833 square kilometres and a population of 3,314,043 National Population Census (NPC) (2006), The predominant tribe are Ebira, Yoruba, and Igala. The major crops grown in the study area are cassava, yam, maize, cashew, groundnut and melon and they also rear livestock e.g. goats, sheep, poultry, pig, and herds of cattle.

Sampled Technique and Sample Size

A multi-stage sampling technique was employed. Firstly Kogi State will purposively Selected based on a priori knowledge in Moringa oleifera producing. The second stage was involve a purposive selections of two Local Government Areas (LGAs) from Kogi State respectively. The selection was based on sampling procedure, sample size and the preponderance of Moringa oleifera producing areas in each LGAs, namely:Ankpa and Omala.The third statge was involve random selection of three (3)villages from each of the Local Government Areas in all six (6) villages namely:Inye, Ejegbo, EnaboAbejukolo, Ogudo and Ola were selected from (LGAs) inall (6) six villages in the LGAs. In the fourth state was involve the use of Taro Yammaneformula to select the farmers. Atotal of one hundred and three (103) farmers were selected in this study. The Yammane formula for appropriate sample size determination was employed by Eboh (2009) and Ibrahim (2016). Data were collected using structured questionnaire. Objective i and ii: Was analysed using descriptive statistics. The effect of utilization of *Moringa oleifera* on rural households will be measured using 3point Likert type of scale to achieved objective II which will involve Highly utilized (3) utilized (2) and not

utilized (1) The mean score for the scale was three (3+2+1=6/3=2) will be considered as reference mean for the scale. Thus, Mean Score ≥ 2 will be adjudged=Highly utilized Mean Score <2 will be adjudged =Not utilized

Objective ii: The perception of rural households on medicinal benefits of *Moringa oleifera* will be measured using 3-point Likert type of scale to achieved objective III which will involve Highly perceived (3), moderate perceived (2) and low perceived (1) The mean score for the scale was three (3+2+1=6/3=2) will be considered as reference mean for the scale. Thus,

Mean Score ≥ 2 will be adjudged= High perceived

Mean Score <2 will be adjudged =Low perceived

Logit regression model

Objective iii was analysed using Logit regression model in its implicit form is given as:

$Y = \alpha + \beta x_i + e$

$Y=f(X_1, X_2, X_3, X_4\ldots\ldots X_n)$

The explicit form of logit regression model is expressed as:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 +\ldots B_{10} X_{10} + e$

Where,

Y = Health benefits (Yes=1, 0=otherwise)

X_1 = Age (years)

X_2 = Gender (Male = 1, 0 = Otherwise)

X_3 = Level of education (years)

X_4= Household size (number)

X_5=Income (Naira)

X_6= Access to creadit (yes or no)

X_7=Cooperative membership (numbers)

X_8=Extension contact (number of contact)

X_9=Level of awareness of moringa product(aware = 1, 0 = otherwise)

X_{10}=Experience in moringa utilization (years)

X_{11}=Availability of moringaproduct (available=1, 0=otherwise)

X_{12}= Accessibility of moringa product (access=1, 0=otherwise)

X_{13}=Importance of moringa utilization (Importance=1, 0=otherwise)

U = error term.

RESULTS AND DISCUSSIONS

Level of utilization of *Moringa oleifera* among the rural households

The result of the level of utilization of monringa oleifera revealed that use for cooking tea ($\bar{X}$ =2.62) ranked 1st, implying that *Moringa*

oleifera is used among the respondents as tea. This finding concur with that of Odetola*et al;*(2020) who reported that Moringa is highly used as tea among rural household in Nigeria. It is use for Vitamin A, C and minerals ($\bar{X}$ =2.50) ranked 2nd, indicating that Moringa provide vitamins and essential mineral needed for growth and sound health. This also agrees with finding by Odetola*et al.* (2020) who reported that *Moringa Oleifera* contains Vitamins and

Minerals needed for development. Also, life fencing ($\bar{X}$ =21.4), showing that Moringa could be used for life fencing income generation ($\bar{X}$ =2.20) and ornamental ($\bar{X}$ =2.20) both ranked 4th. This shows that Moringa could be used as sources of income to household and can also be used as flowers to beautifying environment. Moringa can also be used as a cut flower or flowers can be collected for decoration purposes (Maroyi, 2016).

Table 1: Distribution of Respondents According to Level of Utilization of *Moringa Oleifera*

Variables	Highly utilized	Utilized	Not utilized	Sum	Mean	Decision
Use for cooking tea	62 (60.2)	41 (39.8)	0	268	2.62	U
Used for chewing stick		52 (50.5)	51 (49.5)	155	1.50	N
Use for cultural practice	52 (50.5)	10 (9.7)	41 (39.8)	217	2.11	U
Use for Vitamin A, C and minerals	52 (50.5)	51 (49.5)	0	258	2.50	U
To aid digestion	21 (20.4)	72(69.9)	10 (9.7)	217	2.11	U
To stimulate appetites	0	93 (90.3)	10 (9.7)	196	1.90	N
Used for promote energy	0	93 (90.3)	10 (9.7)	196	1.90	N
Nutritional supplement	0	73 (70.9)	30 (29.1)	176	1.71	N
Animal feed	22 (21.4)	20 (19.4)	61 (59.2)	167	1.62	N
Extraction of seed oil	30 (29.1)	0	73 (70.8)	163	1.58	N
Income generation	62 (60.1)	0	41 (39.8)	227	2.20	U
Water purification	20 (19.4)	73 (70.9)	10 (9.7)	216	2.09	U
Ornamental	31 (30.1)	62 (60.2)	10 (9.7)	227	2.20	U
Life fencing	52 (50.5)	41 (39.8)	10 (9.7)	248	2.41	U

Sources: Field survey, 2021

U = Utilize and N = Not utilize

Perceived health benefits of *Moringa oleifera*

The result of the perceived health benefits revealed that household in the study area agreed with the following perceived benefits of *Moringa oleifera*. Regulation of high pressure ($\bar{X}$ =5.0) ranked 1st, implying that Moringa has ability of regulating household suffering from high blood pressure. This finding is in agreement with Stevens *et al*. (2013) who reported that *Moringa oleifera* played active roles in blood pressure regulation. Also, use for body pain ($\bar{X}$ =4.81), hypertension ($\bar{X}$ =4.81), and beautifies

skin ($\bar{X}$ =4.81) ranked 2nd. This finding is in agreement with that of Stevens *et al*. (2013) who reported that Moringa oleifera is used as body pain reliever and skin beautifiers. Also, used in treatment of fever ($\bar{X}$ =4.79), use for stomach pain ($\bar{X}$ =4.69), use for treatment of diabetes ($\bar{X}$ =4.21), use for treatment of arthritis ($\bar{X}$ =4.09) and use for treatment of cough ($\bar{X}$ =3.82). This result is in agreement with that of Paula *et al.* (2021) who reported that *Moringa oleifera* is used in treatment of several ailment confronting rural households in Nigeria.

Table 4.2: Distribution of respondents according to perceived health benefits of *Moringa oleifera*

Variables	SA	A	UN	D	SD	Sum	Mean	Decision
Use for stomach pain	72 (69.9)	31 (30.1)	0	0	0	484	4.69	A
Used for body pain	83 (80.6)	20 (19.4)	0	0	0	495	4.81	A
Use for treatment of cough	21 (20.4)	52 (50.5)	20 (19.4)	10 (9.7)	0	393	3.82	A
Use for treatment of diabetes	42 (40.8)	41 (39.8)	20 (19.4)	0	0	434	4.21	A
Used for hypertension	83 (80.6)	20 (19.4)	0	0	0	495	4.81	A
Used beautifies the skin	83 (80.6)	20 (19.4)	0	0	0	495	4.81	A
Used for treatment of fever	82 (79.6)	21 (20.4)	0	0	0	494	4.79	A
Used for treatment of arthritis	31 (30.1)	51 (49.5)	21 (20.4)	0	0	422	4.09	A
Used for high blood	103 (100)	0	0	0	0	515	5.00	A

Sources: Field survey, 2021

A = Agree and DA =Disagree

**Factors affecting *moringa oleifera* among the rural households **

The result from Table 3 indicate that household (0.1647064) was positively significant at 5% level of probability, implying as household of respondent increases utilization of increases. This finding agreed with Kassali *et al.* (2020) who reported increase in household is one of the major factors responsible for utilization of *Moringa Oleifera* in Nasarawa State of Nigeria. The coefficient of education level (1.279131) was positively at 1% level of probability, signifying that highly educated household tends to use Moringa than least educated households. This finding concur with that of Azeez *et al.* (2013) who narrated that education played important roles in the utilization of *Moringa Oleifera* for farmers livelihood. The coefficient of membership of association (1.27559) was positively significant at 10% level of probability, implying that access to association will increase utilization of Moringa. Also, the coefficient of availability of Moringa (0.7283301) was positively significant at 5% level of probability, showing that surplus of Moringa products will increase it level of utilization by household in the study area. The coefficient of farming experience (0.0610928) was positively significant at 5% level of probability. This implies that more years in farming will increase utilization of Moringa. The coefficient of farm size (2.604679) was positively significant at 5% level of probability. This denotes that increase more access to farm land will increase moringa utilization.

Table 4.3: Distribution of Respondents According to Factors Affecting *Moringa Oleifera*

Variables	Coefficient	t-value
Age	0.0138201	1.28
Marital	-0.2153769	-1.18
Household size	0.1647064	2.11**
Educational level	1.279131	4.10***
Access to extension	0.1900508	0.84
Membership of association	1.27559	1.82*
Access to credit	-0.2367787	-0.85
Availability of moringa products	0.7283301	2.31**
Important of moringa utilization	-.0161839	-0.25
Farming experience	0.0610928	2.31**
Income	-.0004568	-0.52
Farm size	2.604679	7.05**
Accessibility of moringa products	-.4176037	-1.28
Constant	35.7827	24.68***

Sources: Field survey, 2021

CONCLUSION AND RECOMMENDATIONS

It can be concluded that most of the respondents in the study area utilized *Moringa oleifera* on monthly basis. All the households in the study area utilized Moringa stem, Moringa leave and Moringa bark. Further findings showed that Moringa had were utilized according to the following statements; use for cooking tea, use for Vitamin A, C and minerals, life fencing, income generation, ornamental, use for cultural practices, aid digestion and water purification. The households in the study area agreed with the following statements; Regulation of high pressure, use for body pain, hypertension, and beautifies skin and used in treatment of fever. The coefficient of household size, education level, membership of association, availability of Moringa, farming experience and farm size affects *Moringa Oleifera* among the rural households. It is recommended that It is therefore necessary for farmers to increase their farm size in order to the output of *Moringa oleifera*. Extension agents should create awareness on the health benefits of *Moringa oleifera* in the study area. Household should look for means of tackling menace of pests and diseases associated with Moringa utilization in the study area.

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