



Research Article

Perception of Rural Dwellers on the Nutritional and Medicinal Values of *Moringa oleifera* in Ido Local Government of Oyo State

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ABSTRACT

The study investigated the perception of rural dwellers on nutritional and medicinal values of *Moringa oleifera* in Ido Local Government Area of Oyo State, Nigeria, with the specific objectives of assessing the demographic characteristics of rural dwellers. Also, to determine the level of awareness of nutritional and medicinal values of *Moringa*, identify the various ways in which respondents consume Moringa, assessing rural dwellers' sources of information and identify the perceived nutritional and medicinal benefits of *Moringa* in the study area. A purposively sampling technique was used to collect information with the aid of structured questionnaire from 120 respondents. Data collected were analyzed using frequency counts and percentages. The study reveals that more than half of the respondents were mostly male (53.3%), married (60%), while majority of them had some form of formal education. Majority (40.8%) of the respondents preferred taken powdered leaves. The study showed that half (50.0%) and 42.5% of the respondents had access to information through friends/relatives and radio respectively on the utilization of Moringa. It was recommended that the government should try to minimize the constraints encountered by the rural dwellers in the consumption of Moringa by providing the basic amenities necessary for life in rural areas and rural dwellers should be motivated through credit facilities and series of training on cultivation and utilization of Moringa.

INTRODUCTION

Moringa is a tropical plant belonging to the family Moringaceae and grows throughout the tropics. The genus Moringa consists of 13 species (NRC, 2006), of which only Moringa oleifera has been accorded research and development. Moringa (*Moringa oleifera* Lam.) is native to the Indian subcontinent and has become naturalized in the tropical and subtropical areas around the world. It is the most widely cultivated species of the genus Moringa. The tree is known by such regional names as Benzolive, Drumstick tree, Horseradish tree, Kelor, Marango, Mlonge, Mulangay, Saijihan and Sajna (Fahey, 2005) and grows quickly in many types of environments. It can grow well in the humid tropics or hot dry lands and can survive in less fertile soils and it is a little affected by drought (Anwar et al., 2007). It is considered as one of the World's most useful trees, as almost every part of the Moringa tree can be used for food, medication and industrial purposes (Khalafalla et al., 2010).

Much of the plant is edible by humans or by farm animals. The leaves are rich in protein, vitamin A, vitamin B, vitamin C and minerals (Janick, Jules and Robert, 2008). Its common names include moringa, benzolive tree and West Indian ben. It is also known as drumstick tree, from the appearance of the long slender, triangular seed pods, horseradish or ben oil tree.

Moringa oleifera is a shrub with numerous benefits especially in the treatment of human and animal health. Every part of Moringa, including the seeds and roots are very useful in tackling many diseases. People use its leaves, flowers and fresh pods as vegetables, while others use it as livestock feed (Anjorin et al., 2010). It is commonly grown for its leaves, which are used in soup, while in some region, the young seed pods are the most commonly eaten (FAO, 1999). The flowers are edible when cooked and are said to taste like mushrooms. The bark, sap, roots, leaves, seeds, oil, and flowers are used in traditional medicine in several countries. The immature seed pods are prepared by parboiling and cooked in a sauce until soft (Elizabeth Schneider, 2001). The seed pods are particularly high in vitamin C. According to USDA, the leaves are the most nutritious part of the plant, being a significant source of vitamin B₆, vitamin C, provitamin A as beta-carotene, magnesium and protein, among other nutrients. When compared with common foods particularly high in certain nutrients, fresh moringa leaves are considerable sources of these same nutrients (Fugile, 1999).

Moringa is a food, medicine and forage crop and the health benefit of moringa is limitless. It is a strong antioxidant effective against prostate and skin cancers.

It is an anti-tumour and anti-ageing substance. It modulates anemia, high blood pressure, diabetes, high serum or blood cholesterol thyroid, liver and kidney problems. It has strong anti-inflammatory properties ameliorating rheumatism, arthritis, edema and lupus. It is effective against digestive disorders including colitis, diarrhea, flatulence –gas, ulcer or gastritis. Moringa is an anti-bacterium, anti-microbial and anti-viral agent, it is effective against urinary tract infection, typhoid, syphilis, dental carries and toothaches, fungus, thrush, common cold, Epstein-Barr virus, Herpes-simplex, HIV, warts parasites, worms, schistosomes and trypanosomes. It is a detoxifying agent, it is effective against snake and scorpion bites.

It has been observed that the threat of famine is connected to the change of climate. The problem of poverty in developing countries like Nigeria has always give rise to other problems, which include malnutrition and food insecurity especially in the rural areas, where malnutrition is most prevalent. However, in developing countries, moringa has been potentially found to improve nutrition, boost food security, foster rural development and support sustainable landrace (NRC, 2006). Moringa oleifera is a multipurpose tree that has amazing nutritional, therapeutic and prophylactic potentials. 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 (Fahey, 2005; Sanford Holst, 2011). Moringa tree has been used to combat malnutrition, especially among infants and nursing mothers, and as a result regarded as natural nutrition for the tropics (Fugile, 1999).

Moringa is one of the world's most nutritious crops and it is being cultivated in poverty-stricken nations, such as Niger, as a primary source of food and nutrients (www.abc.net.au/worldtoday/content/2012). The leaves contain all the essential amino acids and a wealth of essential nutrients and even thrive well in poor soil conditions and the tree is an outstanding source of nutrition, especially in areas where other food sources are scarce or seasonally unavailable and can grow in a wide of tropical and semi-arid climates, making a viable solution for areas affected by food shortages and populations susceptible to malnutrition. Moringa leaves could practically wipe out malnutrition in the world.

Since foods consumed by the people often affect their well being, there is need to find if any relationship exists between their perception of nutritional and medicinal values of the Moringa they consume and level of consumption of Moringa. In this light, this study will seek answers to these research questions such as:

1. What are the personal characteristics of rural dwellers in the study area?
2. What is the level of awareness of nutritional and medicinal values of *Moringa*?
3. What are the various ways in which they consume *Moringa*?
4. What are rural dwellers' present sources of information on utilization of *Moringa*?
5. What are the perceived nutritional and medicinal benefits of *Moringa* in the study area?

METHODOLOGY

Study Area

The study was conducted in Ido Local Government of Oyo State, Nigeria. Its headquarters are in the town of Ido. It has an area of 986 km² and a population of 103,261 at the 2006 census. It was created out of the old Akinyele local government in 1989. Agriculture is the main occupation in this area; some of the livestock reared include Cattle, sheep, goat, swine, rabbit and snail as well as fish. Their secondary occupations are trading, craftworks, blacksmith, gaari and oil processing. Presently, Ido local government is the largest producer of Cocoa in Oyo state.

Sampling Procedure and Sample Size

The population involved in this study consisted of rural dwellers in Ido Local Government Area of Oyo State. The choice of Ido LGA for this research was due to its well known agricultural activities. For this study, out of the villages in Ido Local Government, five (5) villages were randomly sampled and these villages are Akufo, Bakatari, Idi-amu, Olokuta and Maku. Each selected villages consist of approximately 240 rural dwellers, 10% of the respondents were selected from these five villages given a total of 120 respondents.

Data collection and analysis

Data were collected from the primary sources with the aid of a structured interview schedule. The data collected were analyzed with the aid of the descriptive statistical tools of frequency counts and percentage. An inferential tool, Chi-square (X^2) and Pearson Product Moment Correlation (PPMC) were used to analyze the study hypotheses. The hypotheses were stated in null form (H_0):

Ho₁: There is no significant relationship between the rural dwellers personal characteristics and perceived nutritional and medicinal values of *Moringa*.

Ho₂: There is no significant relationship between the rural dwellers' sources of information and perceived nutritional and medicinal values of *Moringa*.

Ho₃: There is no significant relationship between respondents' level of awareness and perceived nutritional and medicinal values of *Moringa*.

RESULTS AND DISCUSSION

Demographic characteristics of the respondents

The selected personal characteristics of the respondents considered include age, sex, marital status, level of

education, religion, household size, access and source of credit.

Table 1 Shows that 25% of the respondents fall between 20-29 years, majority (27.5%) is within the age bracket 30-39 and 20.8% fall within 40 and 49 years, 12.5% fall within 50 and 59 years, while only (5%) are within 70 years and above. This shows that the respondents are young, active and energetic. Sex on the other hand, is an essential factor in agricultural set up. The productive activities of males and females in agricultural development are very important and must be taken into consideration at every point in time. This study shows that more than half (53.3%) of the respondents are male while 46.7% are female. Also, the study shows that majority (61.7%) of the respondents are Christians, 36.7% are Moslems, while only 1.7% are traditionalists. This means that both Christians and Muslims were knowledgeable about the existence of Moringa. Majority (60.0%) of the respondents are married, 25.8% are single and 7.5% are widowed while only 6.7% are divorced. This study implies that majority of the respondents are married and have responsibilities of their households to meet. The predominance of married respondents suggests that they may be deriving some form of support from family members. Moreover, this study shows that 34.2% of the respondents had secondary education, 33.3% had tertiary education, while 18.3% and 14.2% had secondary primary and no formal education respectively. The high literacy among respondents may enhance adoption of innovations on moringa.

Respondents awareness level of nutritional and medicinal values of Moringa

Table 2 shows that most (95.8%) of the respondents aware that moringa leaves is highly proteinous, 88.3% believed that moringa leaves are eaten as a vegetable soup and 87.5% agreed that it is very effective in curing headaches. 85% of the respondents agreed that it is very effective in the treatment of fever, while 60% aware that it could be used to treat both eye and ear infections.

However, the table 3 shows the two categories (i.e. high and low) at which respondents are being aware of nutritional and medicinal values of Moringa. The result of the analysis as indicated on the table shows that more than half (55.8%) of the respondents are quite aware of both nutritional and medicinal values of Moringa. Therefore, the level of awareness is high and hence, there is little need to create more awareness on the usefulness of Moringa.

Frequency of Moringa consumption

The study (Table 4)shows that majority (40.8%) always taken powdered leaves, while 4.3% has never taken. 36.7% of the respondents always taken when dried and crushed into powder to make soups and sauce, while

only 5% has never taken it. Moreover, 28.3% always roots and leaves when boiled, while only 2.5% has never taken it. Also, 30.8% always taken leaves when cooked, while only 4.2% had never taken it.

Sources of information on utilization of Moringa

This study shows that half (50.0%) of the respondents had access to information through friends/relatives on a regular basis on the utilization of Moringa. Moreover, 42.5% had access to information through radio on a regular basis. However, only 6.7% had access to information through mobile phone on a regular. The finding that about 94% of respondents used radio as an information source supports the findings of FAO (1989) who observed that radio was among the electronic media used successfully in rural areas.

Perceived nutritional and medicinal benefits of Moringa

Table 6 shows that the majority of the respondents strongly agreed and agreed on the nutritional and medicinal values of Moringa, a few of them were undecided for all the perception statement. Thus, critically analyzing this, it can be seen that there is a strong positive perception of the respondents. There is favourable (63.3%) perception of nutritional and medicinal values of Moringa.

Testing of Hypotheses

Hypothesis one (Ho₁): There is no significant relationship between rural dwellers personal characteristics and perceived nutritional and medicinal benefits of *Moringa*. Result in table 7 shows that there is no significant relationship between respondents' perception of medicinal and nutritional values and age ($r = -0.490$, $p = 0.593$), religion ($r = 0.684$, $p = 0.759a$), educational attainment ($r = 0.334$, $p = 3.403a$). The null hypothesis for each of the selected characteristics above was accepted, while there is a significant relationship between marital status ($\chi^2 = 0.598$, $p = 1.880a$) and perceived nutritional and medicinal benefits of *Moringa*. Therefore, the null hypothesis was rejected. This indicates that the older people have favourable

perceptions toward nutritional and medicinal values of *Moringa*.

Hypothesis Two (Ho₂): There is no significant relationship between the rural dwellers' sources of information and perceived nutritional and medicinal benefits of *Moringa*. Table 8 result shows that there is a significant relationship between the rural dwellers' sources of information and perceived nutritional and medicinal benefits of *Moringa* ($r = 0.252$ and $p = 0.038$). Therefore, the null hypothesis is rejected. It implies that the exposure of the respondents to information sources have perceived effect on nutritional and medicinal benefits of *Moringa*.

Hypothesis Three (Ho₃): There is no significant relationship between respondents' level of awareness and perceived nutritional and medicinal benefits of Moringa. Table 8 shows that there is a significant relationship between respondents' level of awareness and perceived nutritional and medicinal values of Moringa ($r = 0.390$ and $p = 0.033$).

CONCLUSION

It is concluded that the health benefit of moringa is limitless and the majority of the respondents are male, middle-aged, married, with no formal education. Majority of the respondents aware that moringa leaves is highly proteinous and rich in Vitamin A, B, C and minerals, leaves are either taken fresh, dried and cooked, respondents had access to information through friends/relatives on a regular basis on the utilization of Moringa. They speak Yoruba fluently and Moringa does not have any religious taboos while its acceptability cut across both religious and cultural beliefs.

RECOMMENDATIONS

Based on the conclusions of this study, it is therefore recommended that the government should make public awareness on cultivation of Moringa in the rural areas and be motivated through credit facilities and series of training on cultivation and utilization of Moringa in order to ensure sustainable production of this important crop.

Table I: Distribution of selected personal characteristics of the processors (N=120)

variables	Frequency	Percentage
Age		
20-29	30	25.0
30-39	33	27.5
40-49	25	20.8
50-59	15	12.5
60-69	11	9.2
70 and above	6	5.0
Sex		
Male	64	53.3
Female	56	46.7
Religion		
Christianity	74	61.7
Moslem	44	36.7
Traditional	2	1.7
Marital status		
Married	72	60.0
Single	31	25.8
Divorced	8	6.7
Widow	9	7.5
Education attainment		
Non – formal	17	14.2
Primary education	22	18.3
Secondary education	41	34.2
Tertiary education	40	33.3

Source: Field survey, 2012

Table II: Distribution of respondents' level of awareness (N=120)

Uses	Frequency	Percentage
It is highly proteinous	115	95.8
Rich in Vitamin A, B, C and minerals	111	92.5
Leaves are eaten as vegetable soup	106	88.3
Proven to be effective in curing headaches	105	87.5
Effective treatment of fevers	102	85
It is proven to treat eye and ear infections	72	60
proven to stop bleeding	99	82.5
Proven to treat anemia	94	78.3
Leaf can be used to treat gastric ulcers and diarrhea	89	74.2
Leaves are readily eaten as forage for animals	85	70.8
Seed has been proven to treat arthritis	91	75.8
Seed contains oil used in cooking and acceptable to taste	99	82.5
Seed has been proven to treat sexually transmitted diseases	85	70.8
Seed has been proven to treat boils	93	77.5
Seeds are used for treating erectile dysfunction in men	96	80
Seed can be used as a relaxant for epilepsy	98	81.7
Flower juice is useful to solve urinary problems	100	83.3
Bark is an appetizer	79	65.8

Source: Field survey, 2012

Table III: Categorization of nutritional and medicinal values of Moringa awareness

Level	Frequency	Percentage
Low (< mean)	53	44.2
High (≥ mean)	67	55.8
Total	120	100

Source: Field survey, 2012

Table IV: Distribution of respondents' frequency of consumption of Moringa

Consumption of Moringa	Always(%)	Occasionally(%)	Rarely(%)	Never(%)
Powdered leaves taken	49 (40.8)	45 (37.5)	22 (18.3)	4(3.3)
leaves eaten dried, crushed into powder to make soups & sauce	44 (36.7)	46 (38.3)	24 (20.0)	6 (5.0)
roots and leaves boiled	34 (28.3)	47 (39.2)	36 (30.0)	3 (2.5)
bark, roots and leaves boiled	35 (29.2)	61 (50.8)	22 (18.3)	2 (1.7)
leaves eaten cooked	37 (30.8)	62 (51.7)	16 (13.3)	5 (4.2)
leaves eaten fresh	20 (16.7)	76 (63.3)	24 (20.0)	-
leaves cooked used for seasoning foods	25 (20.8)	61 (50.8)	31 (25.8)	3 (2.5)

Source: Field survey, 2012

Table V: Percentage distribution of respondents based on their sources of information on utilization of Moringa (n=120)

Information sources	Frequency of access		
	Regular (%)	Occasional (%)	Never (%)
Extension agents	9.2	42.5	48.3
Radio	42.5	48.3	8.3
Farmers association	33.3	51.7	15.0
Friends/Relatives	50.0	35.5	15.0
Television/Video	21.7	34.2	44.2
Newspapers/Pamphlets	17.5	35.0	47.5
Mobile phone	6.7	28.3	65.0
Internet	17.5	34.2	48.3

Source: Field survey, 2012

Table VI: Percentage distribution of respondents based on perceived nutritional and medicinal benefits of Moringa

SN	Benefits	SA	A	U	D	SD
1	Moringa contains all amino acids	36(30)	79(65.8)	4(3.3)	1(0.8)	-
2	It helps in food digestibility	75(62.5)	39(32.5)	5(4.2)	1(0.8)	-
3	Moringa is a very good natural energy booster	54(45)	59(49.2)	7(5.8)	-	-
4	It has antibiotic properties, which is effective against many infectious organisms	37(30.8)	71(59.2)	9(7.5)	3(2.5)	-
5	Moringa is good for making food seasoning	53(44.2)	61(50.8)	5(4.2)	-	-
6	It cures headaches and migraines with high effectiveness and immediacy.	31(25.8)	75(62.5)	11(9.2)	3(2.5)	-
7	Moringa provides good nourishment by supplying all essential nutrients to the body.	8(6.7)	8(6.7)	27(22.5)	52(43.3)	25(20.8)
8	Moringa will rather pollute water than purify it	8(6.7)	8(6.7)	27(22.5)	52(43.3)	25(20.8)
9	Moringa provides good alternative in the treatment of rheumatism	21(17.5)	79(65.8)	14(11.7)	4(3.3)	2(1.7)
10	It cannot prevent human body from malaria infection	44(36.7)	51(42.5)	11(9.2)	11(9.2)	3(2.5)
11	That moringa can detoxify the body are all lies	13(10.8)	9(10.5)	24(20)	46(38.3)	28(23.3)
12	Moringa cannot make a good tea	58(48.3)	41(34.2)	8(6.2)	5(4.2)	8(6.2)
13	moringa is good for human health	79(65.8)	23(19.2)	6(5.0)	5(4.2)	7(5.8)
14	It is a nutritional supplement for HIV/AIDS patients	13(10.8)	66(55.0)	34(28.3)	5(4.2)	2(1.7)
15	Moringa can be good for increasing libido	21(17.5)	69(57.5)	24(20)	5(4.2)	1(0.8)
16	One better seek medical advice for treating venomous bites than result to Moringa	5(4.2)	4(3.3)	20(16.7)	57(47.5)	34(28.3)

Source: Field survey, 2012

Table VII: Chi-square test of the relationship between selected personal characteristics and perceived nutritional and medicinal benefits of *Moringa*. N=120

Variables	r-value	p-value	Remark	Decision
Age	-0.490	0.593	NS	Accept Ho
Religion	0.684	0.759a	NS	Accept Ho
Marital status	0.598	1.880a	S	Reject Ho
Educational attainment	0.334	3.403a	NS	Accept Ho

Source: Field survey, 2012

Table VIII: PPMC results of correlation

Variables	r-value	p-value	Remark	Decision
Exposure to information	0.252	0.038	S	Reject Ho
Awareness	0.390	0.033	S	Reject t Ho

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