RURAL HOUSEHOLDS' PERCEPTION OF AFRICAN YAM BEAN UTILISATION IN EKITI STATE, NIGERIA

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ABSTRACT
This study assessed rural household's perception of the African Yam Bean (AYB) (*Sphenostylis stenocarpa*) utilisation in Ekiti state, Nigeria. Specific objectives were to describe socioeconomic characteristics of rural households in the study area; examine the extent of utilisation among rural households; and constraints to utilisation of AYB in the study area. Multistage sampling procedure was used to select one hundred and twenty respondents. Data collected using structured interview schedule were analysed using descriptive statistical techniques and Pearson correlation. The results revealed majority of rural household (67.5%) had favourable perception of African yam bean utilisation, though moderate number of rural households rarely utilising as food, cover crop and fertiliser. Prolonged cooking time, odour during cooking and hardness of the seed coat were the major constraints to its utilisation. Furthermore, there was positive and significant relationships ($p < 0.05$) between rural households' socio-economic characteristics such as household size (r= 0. 49), extension contacts (r= 0.38) and rural household perception of utilisation of AYB. It was concluded that rural households have high perception towards utilisation of African yam bean though the utilisation status is declining. Extension personnel should create awareness on the nutritional and health benefits of the crop to alleviate poverty among rural households.
Keywords: African yam bean, Health benefits, Perception, Household, Utilisation

INTRODUCTION

African Yam Bean – AYB (*Sphenostylis stenocarpa (Hochst ex.A Rich)* like other tuberous legumes (e.g., *Pachyrhizus spp.*) belongs to the Fabaceae family (George, Obilana, and Oyeyinka, 2020). Neglected and Underutilised Species such as African Yam Bean known by various names, including orphan, abandoned, lost, forgotten, neglected, underutilised, local, minor, poor man's food, traditional, alternative, niche, or underdeveloped plants (Padulosi, 2017) It is an under-exploited annual leguminous plant grown extensively in all parts of Africa except in North Africa (Afolabi, Ogunsanya and Lawal,2019). Its cultivation is most common in West and Central Africa (Ojuederie, Popoola, Aremu, Babalola, 2021). AYB is known as Neglected and underutilised domesticated and wild plants species which have been used for centuries as sources of food, fibre, fodder, oil, or have medicinal properties (stimulants, narcotics, aromatics), but their importance has remained unharnessed, abandoned, replaced with exotic foods or only very slowly now being considered for use Nnamani, Adewale, Oselebe and Atkinson 2021)

Based on colour and colour pattern, various forms exist, such as: grey, white, black, brown and the stripped with various patterns. Seed colour, size and shape of the crop are very distinct (Gbenga-Fabusiwa, 2021). Planting of AYB seeds start once the rainfall has stabilized. Bolaji (2021) counselled that the planting should not exceed June but can begin as early as April in the year. Flowering in AYB starts between October/November, pod harvest is usually between December and January of the following year (Bolaji 2021).

Seeds are consumed in various forms by blending it with other crop such as maize, rice, sorghum cassava flour and to form complete proteins , composited with rice as meal, corn(Nnamani *et al.* 2017; Adesegun, 2020).The seed is rich in both essential and non-essential amino acids including lysine, methionine, histidine, arginine, aspartic acid, glycine, alanine, valine, and phenylalanine at levels higher than most mainstream legumes such as soybean, pigeon pea, cowpea, and bambara groundnut (George, Obilana,and Oyeyinka,2020; Agunwah, (2019).

Despite the nutritional value and other importance of AYB, its cultivation and utilisation are still low. Critically, the extent of cultivation and utilisation of the crop in rural and urban setting of Nigeria is unknown. This has necessitated the present investigation. Therefore, the study seeks to assess the perception of rural household towards African Yam Bean utilisation.

The specific objectives were to:

i. describe socio-economic characteristics of rural household in the study area;
ii. explore reasons for utilisation of African yam bean in the study area; and
iii. examine the constraints to African yam bean cultivation and utilisation in the study area.

The study also hypothesized that there is no significant relationship between rural households' perception of AYB and some selected socioeconomic characteristics.

METHODOLOGY

This study was conducted in Ikole-Ekiti Local Government Area, Ekiti State, Nigeria in the year 2021. Ekiti State is largely an agriculture-based state in the country and is situated entirely within the tropics. It is located between longitudes 40°51′ and 50°451′ east of the Greenwich meridian and latitudes 70°151′ and 80°51′ north of the Equator. It lies south of Kwara and Kogi States, East of Osun State and bounded by Ondo State in the East and in the South; with a total land Area of 5887.890 sq. km. Ekiti State has 16 local government councils. The population projection of Ekiti State at as at 2st March 2022 was 3,992,250 people (City Population, 2022). The State enjoys a tropical climate with two distinct seasons. These are the rainy season (April – October) and the dry season (November – March). Temperature ranges between 21°c and 28°c with high humidity.

Two stage sampling techniques was used to select the respondents for this study. The first stage involved the purposive selection of six rural communities in Ikole Ekiti Local Government Area which are Itapaji, Oke ijebu, Oke-ayedun, Odo-ayedun Ayebode and Odo-oro respectively because the communities are known for cultivation and utilisation of AYB. The second stage involved the random selection of 20 rural households from each of the six rural communities, making a total of 120 respondents. Data were obtained with an interview schedule using questionnaire. Data were analysed using descriptive statistics such as frequency, percentage, mean, standard deviation. Focus Group Discussions were carried out in three rural communities (Odo-oro, Oke-ayedun and Ayebode) out of the six rural communities in the study area to identify constraints to the production and utilisation of African yam bean. Each focal group contained five people in each of the selected rural communities.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 presents the profile of the respondents in terms of their age. The results in Table 1show that the mean age of the respondents was 55±10.2 years. This implies that majority of the respondents were old and ought to have adequate knowledge about cultivation and utilisation of AYB. The finding is in line with Iwuchukwu, *et.al*, (2017) who reported that age is considered as an important variable in agriculture because of its influence on farmers' productivity, attitude, skill, aspiration, and adoption of technologies. Majority (76.7%) of the respondents were male, indicates that men in rural households **d**ominate the cultivation of African yam bean.

Most (80.8%) of the respondents were married. This might be because of the respect accorded married people in our society and it is generally believed that women usually help men in any farm activities. Furthermore, respondents have an average household size of 6 persons. Majority (85%) of the respondents had one form of education or the other. This high level of literacy is expected to influence the respondents' perception on the utilisation and awareness of African yam bean. Literacy also enhances capacity of farmers to be responsive to the dissemination of information and acceptance of innovations.

The majority (68.3%) of the respondents have more than fifteen years of farming experience. This should predispose them to have adequate information on the perception, utilisation and awareness of African yam bean.

Results in Table 1 also reveal that the majority (57.5%) of the respondents had no contact with extension agents in the last one year to discuss cultivation and utilisation of AYB. However, some of the rural households (32.5%) had between 1 and 4 contacts and few (10%) had 5 and above contact respectively with extension agents within a year to discuss issues concerning cultivation and utilisation of ABP. The low level of extension contact might be because extension agents were not well equipped to face the challenges ahead, like inadequate funding and inadequate training on the cultivation and utilisation of AYB.

Table 1: Distribution of respondent's socio-economic characteristics

Variables	Frequency	Percentage	Mean/STD
Age (years)			
≤ 25	1	0.8	
26-50	40	33.3	55(15.8)
≤51	79	65.8	
Sex			
Male	92	76.7	
Female	28	23.3	
Marital Status			
Single	4	3.3	
Married	97	80.8	
Widowed	16	13.3	
Separated	2	1.7	
Divorced	1	0.8	
Household size			

Variables	Frequency	Percentage	Mean/STD
≤ 5	48	40.0	
6-10	70	58.3	
≥11	2	1.7	
Level of education			
Never attended school	17	14.2	
Primary School	70	58.3	6(2.1)
Secondary school	20	16.7	
Tertiary education	11	9.2	
Adult education	2	1.7	
Year of farming			
≤15	82	68.3	
16-30	29	24.1	16.4(4.6)
31-45	8	6.6	
≥46	1	0.8	
Extension contacts in the last one year			
Never	69	57.5	
≤4	39	32.5	
≥5	12	10	

Perception of Rural Household towards African Yam Bean cultivation and utilisation

The results in Table 2 show the percentage of responses to perception statements by the respondents. The result reveals that majority of rural households strongly agreed (97.5%) that African yam bean has health benefit. This implies that the rural household knows that the crop has health benefits. Furthermore, all rural households strongly agreed and agreed (100%) that African yam bean is good for elderly person because of its medicinal value. This is an indication that the rural household believed that yam bean is good for elderly person because of its medicinal value. Furthermore, the rural households strongly agreed and agreed (97.5%) that African yam bean fills stomach when eaten and sustain hunger, which implies that they were of opinion that crop sustains hunger in addition, they reported that whenever African yam bean is eaten to the farm in the morning, it sustains till evening. The rural household also strongly and agreed (98.3%) that African yam beans prolong cooking time discourage people from buying it. This implies that AYB had prolong cooking time which usually discourage people from buying it. Interestingly, the majority (66.7%) of the rural households strongly agreed that the production of the crop is dwindling which implies that they believed African yam bean production is going into extinction. The rural households also majority of rural households (78.3%) strongly disagreed that the crop is always available in local market which implies that there has been reduction in recent time the quantities of AYB available in the market which mighty be as a result of the number of people that are cultivating it.

On the other hand, the rural households strongly disagreed and disagreed (84.2%) that African yam bean seed price of AYB is not low compared to other beans in the market. This implies that AYB seed is expensive and not cheap despite its shortcoming in prolong cooking. The respondents added that the price of African yam bean depends on season of its cultivation. However, majority of rural households strongly disagreed (65.0%) that African yam bean are not sweet as other bean so it does command attraction from people which implies that African yam bean is sweet compared to other bean, so it does command attraction from people. Moreover, majority of rural households strongly disagreed and agreed (70.8%) that the crop is a poor man`s food (mean= 2.55) which implies that African yam bean it is a not poor man`s food only but also rich and the average people because of the high price in the market , they added that a crop that is capable of providing the required essential nutrient to the body for poor and rich people.

Table 2: Distribution of Respondents According to Rural households perception of African Yam Bean

Perception statement	SA	A	N	D	SD
The beans are not sweet as other beans so does not command higher market value	21.7	0.03	1.0	0.0	65.0
Prolong cooking time discourage people from buying it	91.7	0.05	0	0	0.03
The crop is environmentally friendly	90.0	6.7	3.3	0	0.0
It is good for elderly person because it contains medicinal value	95	5.0	0	0	0.0
The bean are not sweet as other beans so does not command attraction from people	25.0	11.7	0	35.0	28.3
Prolong cooking time discourage people from utilising it	82.5	15.8	0	1.6	0.0
The price of AYB is low compared to other beans in the market	5.0	10.0	0.8	44.2	40.0
The production of the crop is dwindling	66.7	22.5	6.7	4.2	0.0
The crop has health benefit	97.5	2.5	0.0	0.0	0.0
The crop fills and sustains hunger	89.2	8.3	0.8	0.0	0.0
The seed of the crop is cheap to buy	10.0	45.8	21.7	19.2	3.3
The crop is always available in local market	10.0	10.0	0.8	0.8	78.3
African yam bean is not readily available in major market	45	23.3	3.3	21.6	6.7
African yam bean is a poor man`s food	21.7	5.8	1.7	47.5	23.3

SA- Strongly agree, A-agree, N- neutral, D-Disagree, SD-strongly disagree

Categorization of respondent's perception of African Yam Beans

The results in Table 3 show that the mean of 3.42 was used to determine the respondent's level of perception. Therefore, value greater than or equal to 3.42 is favourable perception and any mean less than 3.42 is unfavourable. Figure 1 indicate that majority (67.1%) of the rural household had favourable perception of AYB utilisation while 32.9% had unfavourable perception. The findings is in line with Nnamani et al (2017) who revealed that proportional quantities of the population in Nigeria had an awareness and perception of the food and nutritional values inherent in African yam bean seeds

Table 3: categorization of rural household perception of AYB

Perception	Frequency	Percentage	Maximum	Minimum	Grand mean
Favourable	81	67.1	70	14	3.42
Unfavourable	39	32.9			

African yam bean utilisation by Rural household

The results in Table 4 shows that majority of rural household rarely utilised African Yam Bean as food while 5.0 percent always used it for food consumption. This implies that consumption of AYB as be on declining. Declining might be because of neglected and underutilise of AYB by farmers in the recent time. Furthermore, the results in Table 3 shows that African yam bean was always utilised as green manure by 3.3% of the rural household, rarely utilised as green manure by 15.8 % of the rural

Table 4: Distribution of respondents according to African yam bean utilisation by preference N=120

Utilisation of African yam bean by preference	Not used Frequency F (%)	Rarely used Frequency (%)	Always used Frequency (%)
Food	0(0.0)	118(98.3)	6(5.0)
Green manure	97(80.8)	19(15.0)	4(3.3)
Cover crop	(24(20)	63(52.5)	33(27.5)
Natural fertiliser	34(28.3)	71(59.2)	15(12.5)
Ornament for decoration	120(100)	0(0.0)	0(0.0)
Medicine	0(0.0)	114(95.0)	2(1.7)

Source: Field survey, 2021

Household and 80.8% of the rural household did not utilise it as green manure. This implies that African yam bean was not recognized as green manure for utilisation in the study area. Low acceptability of African yam bean as a valuable crop among rural household in Africa (Adewale and Adegbite, 2018)

The result in Table 3 shows that African yam bean was always utilised as cover crop by 27.5% of the rural household, rarely utilised as cover crop by 52.5% of the rural households while 20% of the rural household did not utilise it as cover crop. This implies that African yam bean was used rarely in the study area as cover crop in the study area. Also, African yam bean was rarely utilised as natural fertilisers by 59.2% of the rural household, always utilised it as natural fertilisers by 12.5% of the rural household while 28.3% of the rural household did not utilise it as natural fertilisers. This implies that majority of the rural household rarely utilised African yam bean as natural fertilisers which helps in fix nitrogen in the soil.

All the rural households interviewed (100%) did not utilise it as ornamental crop. This implies that African yam bean was not utilised at all as ornament for decoration in the study area.

African yam bean was rarely utilised as medicine by majority (95.0%) of the rural household. This implies that despite users of African yam bean know the importance of this crop as source of curative medicine in that the water extracted when African yam bean seed is grinded can be used to cure stomach-ache majority of them seldomly used it.

This is an indication that AYB are used for household food consumption, building up soil fertility and medicinal purposes. This finding corroborates the findings of Gbenga-Fabusiwa (2021) who find out that AYB plants products are very rich in protein, minerals and antioxidants with low glycemic index. Furthermore, George et al, (2020) confirmed AYB's use as a food fortifier and enricher, as well as in complementing foods that are poor and deficient in important nutrients.

Constraints to African yam bean utilisation

Report of the focus group discussion conducted among the rural household that planted and consumers of AYB indicated that processing the seed of AYB to meal requires long cooking time because of the hard seed coat. *'The hardness of the seed coat which leads to prolong cooking is the most prominent limitation to the utilisation of this crop"*. This corroborates the findings of Adewale and Adegbite (2018). This problem has restricted the use among the consuming populace and households. The hours mentioned by the participating respondents ranged between 4-6 hours depending on the intensity of heat applied. It seems this is one of the major reasons why the utilisation status is declining.

Suggestion made by the participant in Oke-Ayedun include soaking of the bean for a while prior to cooking can reduce prolong cooking time. *Participant at the discussion were of opinion that "Unpleasant odour during cooking and the mouth odour after eating is also a constraint to the utilisation of African yam bean which cause them to neglect the utilisation of the bean and that if its being cooked in a household the odour will be perceived in the next household"*.

To some people the odour which emanates during cooking is unappealing to some people, to such people, consumption of African yam bean may not be a primary option and such individuals would prefer another legume as substitute.

Participants in FGD agreed that stakes during the growth and the developmental stage of African yam bean is a laborious exercise which usually discourage farmers continue planting of it. *"The need to provide stakes during the growth and the developmental stage of African yam bean is a laborious exercise and if it is not properly staked, it can reduce the yield of African yam bean"*.

To some would-be-cultivators of the crop, the staking process and stem training of loose vines is laborious. Such individuals may be unwilling to cultivate the crop because of this problem; this may have been among the limiting factors to the cultivation and production of the crop.

The results of correlation analysis in Table 4 reveals that there were positive and significant relationships ($p<0.05$) between rural households' socio-economic characteristics such as year of farming experience (r= 0. 49), household size (r= 0.42) and extension contacts (r= 0.38) rural households' perception of utilisation of AYB. These imply that the higher the household size, extension contact, income and sources of information, and higher the rural household perception of utilisation of AYB. On the other hand, there was negative and significant correlation between age of household head (p = 0.05, r= -0.33) and rural household perception of utilisation of AYB. This indicates that the higher age of household heads, the lower their perception of utilisation of AYB.

Table 5: Relationship between rural household perception of AYB and selected socioeconomic characteristics

Variables	Correlation (r)	Coefficient of Determination (r^2)	Decision
Year of farming experience	0.49	0.24	Positive significant
Household size	0.42	0.18	Positive significant
Extension contacts	0.38	0.14	Positive significant
Age	-0.33	0.11	Negative significant

Source: Field Survey, 2021 $P \leq 0.05$; S = Significant

CONCLUSION AND RECOMMENDATION

Rural households in the study area have a have positive perception towards the utilisation of African yam bean. While all the rural households were aware of African yam bean, not all are involved in its cultivation in the last 10 years probably because of some of its unappealing constraints such as the hardness of the seed coat which leads to prolong cooking and odour which emanates during cooking. AYB was mainly consumed as food with little knowledge about other benefits. Adequate research efforts should be put in place towards breeding for a soft coat variety of the crop that will be easy to cook. Extension programme should distribute improved varieties to the farmers and rural dwellers is equally very important. Extension system should also create awareness not only on the nutritional and health benefits of the crop but also the nitrogen fixing capacity of the crop for soil nutrient improvement.

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