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Rural Households' Preference and Consumption Patterns of African Breadfruit in Osun State, Nigeria: Implication for Food Security

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Abstract

The study assessed the acceptance, frequency of consumption and mode of consuming African breadfruit among rural households in Osun State, Nigeria. Specifically, it examines the socio-economic characteristics of the rural household; examines rural households' frequency and mode of consumption of African breadfruit; and determines the attitude of rural households towards the production and consumption of African breadfruit in the study area. A multi-stage sampling procedure was adopted to select 288 respondents and a structural interview schedule was used to collect data for the study. Data collected was analysed using appropriate descriptive statistics such as mean, frequency count, and percentages and inferential statistics such as chi-square and correlation analysis. The results revealed that the mean age was 47.8 ± 1.32 years; the majority (62.2%) of the respondents were male. Also, the majority (85.4%) of the respondents were Yoruba, 12.2 percent were Igbo, and 2.4 percent were Hausa. The mean years of formal schooling was 9.7 ± 4.67 years. The mean average monthly income was ₦41,759 ± 19,461. Similarly, the findings indicated that boiling of breadfruit ranked first (mean =3.11) as the most preferred mode of consumption while puree ranked least (mean = 0.22) as the least preferred mode of consuming African breadfruit. The findings also indicated that the rural household had an indifferent attitude towards the production and consumption of African breadfruit. There was a significant relationship between level of education (r = 0.202), years of formal schooling (r =- 0.165) and cosmopoliteness (r = 0.172) and acceptance of African breadfruit in the study area at p ≤ 0.01. Also, there was a positive and significant relationship between rural households' attitudes towards the production and consumption of African breadfruit and acceptance of African breadfruit (r = 0.219, p ≤0.01). The study concluded that African breadfruit has the potential to increase the health status of the inhabitants in the study area if well consumed, it can benefit the nation and possibly enhance food security among the Nigerian populace. The study recommended among others that agricultural and rural development stakeholders should help in the organisation of the rural households through training, seminars and so on about the importance of African breadfruit thereby promoting its acceptance.

Keywords: Acceptance; African Breadfruit; Rural Households; Food Security

Abbreviations

NTFPs: Non-Timber Forest Products; NTBG: National Tropical Botanical Garden; LGAs: Local Government Areas; OSSADEP: Osun State Agricultural Development Programme.

Introduction

Among the abundant resources embedded in Nigeria are the forest products which are also of economic importance to the rural dwellers. A forest product is any material derived from forestry for direct consumption or commercial use such as lumber, paper production, and the finished structural materials used for the construction of buildings [1]. Forest products are divided into wood products and non-wood products. All other non-wood products derived from forest resources comprising a broad variety of other forest products are collectively described as Non-Timber Forest Products (NTFPs) [1]. Among the examples of Non-Timber Forest Products (NTFPs) are bamboo, rattan, cork, gum, aromatic oils and breadfruit.

Non-timber forest products (NTFPs) are the primary resources from forests and contribute to the economic development in developing countries [2,3]. NTFPs are also acknowledged as being positively associated with forest conservation [4]. The economic benefits from non-timber forest products are likely to change local community attitudes toward maintaining forest biodiversity [5]. The absence of NTFPs would critically have a negative impact on the livelihood and well-being of rural residents [6]. The importance of forest-based resources especially African breadfruit popularly known as "gbere/afon" to the rural populace in Yoruba land, Southwestern, Nigeria is enormous. African breadfruit formed an inherent part of the people's daily life for millennia [7].

Breadfruit is grown due to its nutritional quality. The tree is also used as a vegetable which is widely distributed in tropical Africa [8]. Breadfruits grow easily in a wide range of ecological conditions with minimal input of labour or materials and require little attention or care [9]. However, few African breadfruit growing regions have adequate cultivar diversity for year- round production [10]. As noted by National Tropical Botanical Garden, 2009, most breadfruit cultivars have a main fruiting season between July and November followed by a second smaller season earlier in the year.

Breadfruit can be processed and consumed in many forms, including baked, boiled, mashed, steamed or roasted and consumed with soups or other flavourings. It can be ground into powder and has been found to have bread-making properties and could be used for pastries, weaning foods, breakfasts cereals [11], alcohol, and wood production [8,12], beverages [12-14] and the tree has medicinal and environmental value [15]. Economically, the collection and sales of African breadfruit provide seasonal and off-season income for rural farmers. Many rural dwellers in South-Western and Eastern Nigeria are engaged in the collection and sales of the species [16]. Under favourable climatic conditions and in good soil, 120-200kg of dried grains can be harvested from one tree of the species in a year as noted by the World Agroforestry Centre.

Despite studies have shown the potential of African breadfruit extracts in medicine, enhancing the income of people, maintaining its nutritional value and proximate analysis [11,15,17] little or non-investigation have been conducted to assess the acceptance, frequency and mode of consuming African breadfruit. The foregoing arouses the quest to assess the acceptance, frequency and mode of consuming African breadfruit in Osun State, Nigeria. The specific objectives of the study are to determine the socio-economic characteristics of the rural households, determine the rural households' frequency and mode of consuming African breadfruit and to determine the attitude of the rural households to the production and consumption of African breadfruit.

The following hypotheses were tested:

Hypothesis (Ho1): there is no significant relationship between the socio-economic characteristics of youth and their acceptance of African breadfruit. Hypothesis (Ho2): there is no significant relationship between rural households' attitudes towards the production and consumption of African breadfruit and acceptance of African breadfruit.

Methodology

The study was conducted in Osun State in three Osun State Agricultural Development Programme (OSSADEP) zones namely Ife/Ijesa, Iwo and Osogbo. A multi-stage sampling procedure was used to select respondents. In the first stage, 25 percent of the total Local Government Areas (LGAs) in the three zones were purposively selected based on the predominance of breadfruit. Three out of ten LGAs in Ife-Ijesha zone (Atakumosa East, Ife East and Ife South), two out of seven LGAs in Iwo zone (Irewole and Isokan), and three out of thirteen LGAs in Osogbo zone (Ila, Olorunda and Odo Otin) making a total of eight LGAs. In the second stage, the purposive sampling technique was used to select three communities from each of the selected LGAs making a total of twenty-four communities in all. In the third stage, the purposive sampling technique was used to select four rural households with youth within the age bracket of 18-40 years; father and mother from each of the twenty-four communities making a total of 288 rural household members that formed

the respondents for the study.

Results and Discussion

The results in Table 1 show that the mean age of the respondents was 47.8 years with a standard deviation of 1.32. This result corroborates the findings of Olarenwaju [18] which states that Osun State rural dwellers were middle-aged as the majority fell between the ages of 30 and 60 years. About 62.2 percent of the respondents were male while 37.8% of the respondents were female. This is in agreement with the findings of Gidaroku [19] which indicated that in most rural farming communities, men are more inclined to farming while women only occupy the positions of farmers' wives. The mean family size is 6.35 with a standard deviation of 2.95. This finding is in agreement with Ekong [20] who estimated that the average household size in the rural area of Nigeria is 6. The findings reveal that rural households were no longer as large as they used to be traditionally when large household sizes were needed for farm labour. This observation might be because the majority of parents in rural areas now send their children to schools instead of using them as cheap sources of labour as reported by Alabi [21]. The mean years of formal schooling was 10.7±4.67. This implies that the majority of the respondents were literate and could source the importance of African Breadfruit from friends, neighbours, the internet, and extension agents among others which in turn influenced their perceived knowledge of the importance of African Breadfruit and attitude to its production and consumption. These findings conform with Ojo [22], that the majority of the farmers in South Western Nigeria are literate. The mean average monthly income was ₦41,759 with a standard deviation of 19,461.

Variables	Frequency	Percentage	Mean and SD
Age(years)			
20-30	43	14.9	47.8±1.32
31-40	49	17	
41-50	65	22.6	
51-60	69	24	
Above 61	62	21.5	
Sex			
Male	179	62.2	
Female	109	37.8	
Family Size			
5-Jan	147	51	6.35±2.95
10-Jun	120	41.7	
15-Nov	17	5.9	
Above 15	4	1.4	
Average Monthly Income			
<20000	39	13.5	41759±19461
20000-60000	220	76.4	
61000-100000	28	9.7	
Above 100000	1	0.3	
Years of Formal Schooling			
<5	55	19.1	10.7±4.67
10-May	97	33.7	
20-Nov	134	46.5	
Above 20	2	0.7	

Table 1: Distribution of respondents by their personal and socio-economic characteristics.
Source: Field Survey, 2019

Mode and Frequency of Consuming African Breadfruit

Modes of consuming breadfruit include boiling, pounding, pureeing, frying, mixing with protein, roasting, steaming, mashing, and pudding among others. Results in Table 2 show that boiling (mean =3.11) ranked highest among the listed mode of consumption, followed by pounding (mean =2.42), mixing with protein (mean =1.44), fried chips (mean =1.34) and, roasting (mean= 1.22). This implies that boiling and pounding are the most common modes of consuming breadfruit in the study area. This may be because breadfruit requires much oil for frying. However, the grand mean of the mode and frequency of consuming breadfruit is 1.19. This shows that at least each respondent will consume breadfruit yearly. This finding agreed with Morton [23], who stated that breadfruit can also be fried, baked, steamed and boiled. However, the finding is in contrary to Morton [23], who stated that in West Africa, African breadfruit is sometimes made into puree and pudding.

Mode of Consumption	Yearly (freq%)	Monthly (freq%)	Fortnightly (freq%)	Weekly (freq%)	Daily (freq%)	Total (freq%)	Mean score	Rank
Boiling	6(3.1)	25(8.7)	24(8.3)	105(36.5)	70(24.3)	230(79.9)	3.11	1st
Pounding	6(2.1)	46(16.0)	12(4.2)	85(29.5)	45(15.6)	196(68.1)	2.42	2nd
Mixing with protein	4(1.4)	22(7.6)	30(10.4)	62(21.5)	6(2.1)	124(43.1)	1.44	3rd
Fried chips	2(0.7)	32(11.1)	26(9.0)	16(5.6)	36(12.5)	112(38.9)	1.34	4th
Roasting	4(1.4)	12(4.2)	78(27.1)	18(6.2)	4(1.4)	116(40.3)	1.22	5th

Table 2: Distribution of respondents by their mode and frequency of consumption.
Grand Mean= 1.19. Source: Field Survey, 2019

Attitude Towards the Production and Consumption of African Breadfruit

The results in Table 3 show that planting of African breadfruit is important for its medicinal purpose (mean=2.61) ranked the highest of the attitude towards the production and consumption of African breadfruit, followed by consumption of African breadfruit does not have any medicinal purpose (mean =2.38), planting of African breadfruit can generate income (mean =2.31), consumption of African breadfruit is cheap (mean =2.30), planting of African breadfruit take longer years to mature (mean =2.25), planting of African breadfruit is important for its environment purpose (mean =2.21), my community does not like eating African breadfruit (mean =2.12), planting of African breadfruit cannot generate income (mean =2.08), planting of African breadfruit is important because my community love eating it (mean =2.04), planting of African breadfruit is not important because nobody will buy it (mean =1.98), friends/relations motivate one another to cultivate African breadfruit (mean =1.91), planting of African breadfruit is used as catch crop (mean =1.85), planting of African breadfruit is not important for its low shelf life (mean =1.75), friends/relations do not motivate one another to cultivate African breadfruit (mean =1.63), consumption of African breadfruit require some certain soup (mean =1.56), planting of African breadfruit does not suppress the growth of other crops (mean =1.51), cultivation of African breadfruit is not important because it take too much space (mean =1.44), consumption of African breadfruit does not require certain soup (mean =1.34), there is a cultural taboo restricting its cultivation (mean =1.16), consumption of African breadfruit is associated with slavery (mean =1.10), consumption of African breadfruit is not associated with slavery (mean =0.95) while there is no cultural taboo restricting its cultivation (mean =0.90) ranked the lowest attitude to the production and consumption of African breadfruit. However, the grand mean was 1.79. Based on this, it can be deduced that 54.5 percent of the respondents agreed with the attitude towards the production and consumption of breadfruit.

Attitudinal Statements	SA (freq%)	A (freq%)	D (freq%)	SD (freq%)	Mean Score	Rank
Planting of African breadfruit is important for its medicinal purpose	196(68.1)	75(26.0)	14(14.9)	3(1.0)	2.61	1st
Consumption of African breadfruit doesn't have any medicinal purpose	4(1.4)	18(6.2)	129(44.8)	137(47.6)	2.38	2nd

Planting of African breadfruit can generate income	166(57.6)	65(22.6)	38(13.2)	19(6.6)	2.31	3rd
Consumption of African breadfruit is cheap	151(52.4)	87(30.2)	38(13.2)	12(4.2)	2.3	4th
Planting of African breadfruit take longer years to mature	138(47.9)	95(33.0)	45(15.6)	10(3.5)	2.25	5th
Planting of African breadfruit is important for its environmental purpose	124(43.1)	117(40.6)	33(11.5)	14(4.8)	2.21	6th
My community doesn't like eating African breadfruit	16(5.6)	45(15.6)	113(39.2)	114(39.4)	2.12	7th
Planting of African breadfruit cannot generate income	25(8.7)	46(16.0)	96(33.3)	121(42.0)	2.08	8th
Planting of African breadfruit is important because my community love eating it	114(39.6)	98(34.0)	52(18.1)	24(8.3)	2.04	9th
Planting of African breadfruit is not important because nobody will buy it	47(16.3)	44(15.3)	64(22.2)	133(46.2)	1.98	10th

Table 3: Distribution of respondents by their attitudes towards the production and consumption of African Breadfruit. Grand Mean= 1.79. Source: Field Survey, 2019; SA (Strongly Agree); A (Agree); D (Disagree); SD (Strongly Disagree)

Hypothesis One: Association Between Selected Socio-Economic Characteristics of the Rural Households and their Acceptance of African Breadfruit

Results of chi-square analysis in Table 4 reveal that there was a positive and significant association between acceptance of breadfruit and religion (χ^2= 21.966; P=0.000), level of education (χ^2= 46.136; P=0.000), cosmopoliteness (χ^2= 16.877; P=0.000), farthest distance travelled (χ^2= 22.943; P=0.003) and association membership (χ^2= 15.839; P=0.000) in the study area. This implies that since the majority (62.2%) of the respondents were Christians, religion will influence their acceptance of African breadfruit because Christianity does not place restrictions on the production and consumption of African breadfruit. Also, the more the level of education, the more their acceptance. Education will help the respondents to source for more information on African breadfruit. The result also indicates that the higher their external orientation, the higher their acceptance. External exposure enhances the use of new ideas obtained through external affluence. Also, the more the respondents belong to an association, the more their acceptance of African breadfruit. At $p \leq 0.05$, there was a significant association between ethnic group (χ^2= 10.825; P=0.029), residency in other communities (χ^2= 7.194; P=0.027) and acceptance of African breadfruit. This implies that the fact that the majority (85.4%) of the respondents were Yorubas and were mostly farmers suggests that they are likely to be involved in the production and/or consumption of African breadfruit while those who reside in other communities might get information from their community, thereby enhancing their perceived knowledge.

Variables	χ^2	D.f	C	P-value
Sex	5.39	2	0.136	0.068
Religion	21.966	4	0.266	0.000**
Marital Status	10.606	8	0.188	0.225
Ethnic Group	10.825	4	0.19	0.029*
Residency in other community	7.194	2	0.156	0.027*
Family type	2.142	2	0.086	0.343
Level of education	46.136	10	0.372	0.000**
Cosmopoliteness	16.877	2	0.235	0.000**
Farthest distance travelled	22.943	8	0.29	0.003**
Association membership	15.839	2	0.228	0.000**

Table 4: Chi-square analysis showing the association between some selected socio-economic characteristics and their acceptance of African breadfruit.

** Significant at P≤0.01; * Significant at P≤0.05; C- Contingency coefficient; χ^2- chi square Df- Degree of freedom; Number of respondents = 288; Source: Field Survey, 2019.

Correlation Analysis Between Selected Socio-Economic Characteristics of the Rural Households and their Acceptance Of African Breadfruit

Results in Table 5 show that years of formal schooling (r= -0.165) had a significant and negative relationship with acceptance of African breadfruit at p ≤ 0.05. This implies that the higher the years spent in formal schooling, the lower the acceptance of breadfruit. This may be due to the fact that indigenes of the rural communities who had an interest in education would have moved out of rural areas to pursue their academic careers. Furthermore, the correlation (r) coefficient of -0.165 for years spent in formal schooling has contributed by 16% to the acceptance of African breadfruit in the study area.

Variable	r-value	p-value	Decision
Age	0.025	0.678	NS
Family size	-0.24	0.683	NS
Years of formal schooling	-0.165*	0.05	S
Average monthly income	0.097	0.101	NS

Table 5: Correlation analysis showing the relationship between some selected socio-economic characteristics and their acceptance of African breadfruit

*Significant at P≤0.05; NS= Not Significant; S=Significant; Number of respondents= 288; r = correlation co-efficient; p = probability value; Source: Field Survey, 2019

Hypothesis Two: There is No Significant Relationship Between Rural Households' Attitude and Their Acceptance of African Breadfruit

Results in Table 6 reveal that the attitude of rural households to the production and consumption of African breadfruit (r =0.219, p ≤0.01) had a positive significant relationship with acceptance of African breadfruit. This implies that the more positively disposed to the production and consumption of African breadfruit the rural households were, the higher their acceptance. This was so because as the rural households were producing and consuming African breadfruit, they were likely to be searching for more information about the importance which will increase their perceived knowledge. Furthermore, the correlation (r) coefficient of 0.219 for attitude of rural households to the production and consumption of African breadfruit have contributed by 21% to the acceptance of African breadfruit in the study area.

Variable	r-value	p-value	Decision
Rural households attitude towards the production and consumption of African breadfruit	0.219**	0	S

Table 6: Correlation analysis showing the relationship between rural households' attitude towards the production and consumption of African breadfruit and their acceptance of of African breadfruit.

**Significant at P≤0.01; S=Significant; Number of respondents= 288; r = correlation co-efficient; p = probability value; Source: Field Survey, 2019

Conclusion

The study concludes that the majority (77.4%) of the respondents had less than 20 years of knowledge about breadfruit. The respondents had access to information and were also aware of the importance of African breadfruit. The sources of awareness were friends, neighbours, radio, extension agents, television, newspaper, social networks, Farmers Association and seminars. The attitude towards the production and consumption of African breadfruit was indifferent. It was recommended that policy-makers, government and non- governmental agencies should make know the importance of African breadfruit to rural dwellers through training, seminars and so on. Extension workers should be equipped with information that will assist them in training rural dwellers on the value chain activities of African breadfruit to enhance their livelihood. Extension agents should also train farmers on how to cultivate African breadfruit to enhance its production nationwide.

References

1. Belcher B, Ruiz-Perez M, Achdiawan R (2005) Global Patterns and Trends in the Use and Management of Commercial NTFPs: Implications for Livelihoods and Conservation. World Development 33(9): 1435-1452.

2. Olajide OT, Akinlabi BH, Tijai AA (2012) Agriculture resource and economic growth in Nigeria. European Scientific Journal 8(22): 98-112.

3. Oji-Okoro I (2011) Analysis of the contribution of agricultural sector on the Nigerian economic development. World Review of Business Research 1(1): 191-200.

4. Abiodun AS, Jelili ST, Ezekiel PO (2013) Proceedings of the international conference on poverty alleviation, income redistribution and rural development in developing countries. SM&BS. Lagos State Polytechnic, Ikorodu, Nigeria.

5. Enoma A (2010) Agricultural credit and economic growth in Nigeria: An empirical analysis. Business and Economics Journal, pp: 1-7.

6. Hye QMA (2009) Agriculture on the road to industrialization and sustainable economic growth: An empirical investigation for Pakistan. International Journal Agriculture Economics Rural Development 2(2): 1- 6.

7. Gbedomon RC, Fandohan AB, Salako VK, Idohu AFR, Kalai RLG, et al. (2015) Factors affecting home gardens ownership, diversity and structure: A case study from Benin. Journal of Ethnobiology and Ethnomedicine 11: 56.

8. Agbogidi OM, Onomeregbor VA (2008) Morphological Changes in the Seedlings of Treculia africana Grown in Crude Oil Impacted Soils. In: Popoola L (Ed.), Climate Change and Sustainable Renewable Natural Resources Management. Proceeding of 32nd Annual Conference of the Forestry Association of Nigeria, held in Umuahia, Abia-State, Nigeria, pp: 170-182.

9. NTBG (2009) Breadfruit Institute. National Tropical Botanical Garden.

10. Jones AMP, Murch SJ, Ragone D (2010) Diversity of Breadfruit (Artocarpus altilis, Moraceae) Seasonality: A Resource for Year-Round Nutrition. Economic botany 64 (4): 340-351.

11. Appiah F, Oduro I, Ellis WO (2011) Pasting properties of Treculia Africana seed flour in Ghana and the production of a breakfast meal. Agriculture and Biology Journal of North America 2(2): 325-329.

12. Orwa C, Mutua A, Kindt R, Jamnadass R, Anthony S (2009) Agroforestree Database: A tree reference and selection guide version 4.0. World Agroforestry Centre, Kenya.

13. Sunday YG, Mathew NA, Monday OA, Juliet NE (2000) Composition, Functional and Storage properties of flour of raw and heat processed African breadfruit (Treculia africana Decne) seed. Plant for Human Nutrition 55(4): 357-368.

14. Nwabueze TU, Uchendu CB (2011) African Breadfruit (Treculia africana) Seed as Adjunct in Ethanol Production. European Journal of Nutrition & Food Safety 1(1): 15-22.

15. Nuga OO, Ofodile EAU (2010) Potentials of Treculia africana Decne: An endangered species of southern Nigeria. Journal of Agriculture and social research 10(2): 13-19.

16. Ijeomah HM (2006) Forest Resources Depletion and the Role of Rural Women in Selected Communities of Ideato South Local Government Area, Imo State. Process Analytical Technology 2(2): 104-117.

17. Osabor VN, Ogar DA, Okafor PC, Egbung GE (2009) Profile of the breadfruit (Treculia africana). Pakistan Journal of Nutrition 8(7): 1005-1008.

18. Olarenwaju KO (2013) Assessment of Traditional Communication Methods used in Information Dissemination among farmers in Osun State, Nigeria. An Unpublished M. Phil Thesis Obafemi Awolowo University, Ile-Ife.

19. Gidaroku I (2015) Young Women's Attitude towards Agriculture and women's new roles in Greek Countryside: A first approach. Journal of Rural Studies 15(2): 147-158.

20. Ekong EE (2010) Rural Sociology: An Introduction and Analysis for Rural Nigeria. 3rd(Edn.), Dove Educational Publishers, Uyo, Nigeria.

21. Alabi DL (2005) Factors Influencing Effective Management of Financial Resources Among Women in Rural Areas of Osun State, Nigeria. An Unpublished M.Sc. Thesis, Obafemi Awolowo University, Ile-Ife, Nigeria, pp: 90,123.

22. Ojo TF (2013) Influence of Spatial Factors on choice of Livelihood activities Among Rural Farm Families in Osun State, Nigeria. An Unpublished Ph. D. Thesis, Department of Agricultural Extension and Rural Development, Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, Nigeria.

23. Morton JF (1987) Breadfruit in Fruits of Warm Climates. Julia F. Morton Publisher, Miami, Florida, USA, pp: 50-58.