ANALYSIS OF INDIGENOUS YAM VARIETIES PREFERENCE AMONG FARMERS' IN YAGBA EAST LOCAL GOVERNMENT AREA OF KOGI STATE

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ABSTRACT

Preferences in the species of yam have been major issues affecting yam production. This study analysed indigenous Yam varieties preference among farmers' in Yagba East Local Government Area of Kogi State Nigeria. The objectives of the study are to examine the indigenous yam varieties in the study area; identity the sources of information on indigenous yam varieties and identify the constraints to yam cultivation in the study area. The study engaged 133 yam farmers that were randomly selected. Structured questionnaire complimented with interview scheduled were used for data collection. Data were analyzed using descriptive and inferential statistics. Result showed that majority of the yam farmers were male (90.2%), married (91.7%), had farming as primary occupation (65.4%), had farm size of ≤ 2 (72.9%) and with a mean age of 52 years. The findings revealed that 94.0% of the respondents had preference for white yam (Dioscorea rotundata), 88.7% had preference for guinea yam (Dioscorea spp) while 85.7% and 81.2% had preference for aerial yam (D. bulbifera) and Gambari respectively. Radio (94.7%) and 87.2% were the major sources of information on improved yam variety. The major constraints to indigenous yam cultivation were bulkiness of yam tubers ($\bar{X} = 3.47$), access road to farm ($\bar{X} = 3.33$) and inadequate capital ($\bar{X} = 3.31$).The study concluded that yam farmers prefer to cultivate some varieties of yam more than the other. The study therefore recommended that farms should be opened up with accessible roads to facilitate easy transportation of farm produce.

KEY WORDS: *indigenous; yam varieties; preference; farmers*

INTRODUCTION

Yam *(Dioscorea* spp.) is an annual tuber and monocotyledonous crop. Yams are agronomically annual rain fed crops which grow for 6-12 months depending on the cultivar, ecology and soil properties in the production area. The plant genus comprises of over six hundred species with only ten species producing edible tuber. Six of these edible species are cultivated in Africa and only three of them are available in Nigeria. In Nigeria, the primary species cultivated are the white yam *(D. rotundata)*, yellow

yam *(D. cayensis)* and water yam *(D. alata)* (Amusa, 2000; Zaknayiba & Tanko, 2013). Yams are among major cash and most consumed food crops in Nigeria with cultivation very profitable despite high costs of production and price fluctuations in the markets (National Bureau of Statistics, 2012). An average profit per yam seed after harvest and storage in Nigeria was calculated at over US$13, 000 per hectare harvested (International Institute of Tropical Agriculture, 2013). Yam occupies a very important space in the energy diet requirement of Nigerians. It can be consumed boiled, roasted, baked or fried. It can also be processed into crude flour by drying thin slices in the sun and then pound or ground into flour. It can further be processed into instant flakes producing a food similar to instant potato and can also be made into fried chip. Most of starch industries also make use of yam as one of their important raw materials. It provides job opportunities and income to both the producers and the marketers. Yam is the major sources of employment generation for family members in rural areas due to overdependence on family labour (Pelemo *et al.,* 2018). Yam peels serve as feed for livestock and as a good component of farm yard manure. It is used as laboratory crop for scientific investigations (Okeoghene *et al.,* 2013). Yam plays important roles in the social-cultural activities in Nigeria, for instance, some households used yam tubers during marriage ceremonies. More so, yam festival takes place yearly to celebrate its harvest, and other social ceremonies (IITA, 2013). Yam cultivation, like many other crops in Nigeria is labour intensive. Moreover, there are various constraints associated with yam production which may include high cost of labour, low soil fertility, lack of improved yam varieties, poor road networks and lack of finance to carry out necessary farming activities among others. There are different varieties of yam species cultivated in Nigeria. However, these yam varieties have different level of preference due to attributes which include taste, low economic values, colour among other. Therefore, the study tends to analyse indigenous yam varieties preference among farmers' in Yagba East Local Government Area of Kogi State. The specific objectives are to: describe the socio economic characteristics of the yam farmers; examine the indigenous yam varieties in the study area; determine the sources of information on indigenous yam varieties and identify the constraints to yam cultivation in the study area.

       Hypothesis of the study. Ho_1: there is no significant relationship between selected socio-economic characteristics of farmers' and their preference for indigenous yam variety

MATERIALS AND METHODS

This study was carried out in Kogi State, Nigeria. Kogi State is located between latitude 6º30´ N and 8º30´N and longitude 5º51´ E and 8º00´E, in the Guinea forest-savanna ecological zone of Nigeria. The population of the State is 3,314,043 (NPC, 2006). The State has a tropical climate with rainy and the dry seasons. The rainy season lasts from March to October while dry season falls between November and February. The annual rainfall ranges from 1016 mm to 1524 mm. Specifically, Yagba East Local Government Area of Kogi State was used due to the yam cultivation activities. Yagba East Local Government Area is one of the 21 Local Government Areas in Kogi State with headquarters in Isanlu. It is located in the western senatorial district of Kogi State at 8º17´N 5º50´E. The Local Government was created in 1991 with an area of 1396 km² and a population of 199,300 by 2016 (NBS, 2017). The people of Yagba East Local government live in various rural villages, major occupation of the people is farming at subsistence level. The soil is viable for growing crops such as yam, maize, cassava, sorghum, cashew, cocoa, oil palm and coffee.

Sampling procedure and sample size. Two-stage random sampling technique was used in selecting the respondents for the study. In the first stage, 50 percent of the ten communities Yagba North-East and Yagba South-East were randomly selected to give five (5) wards. The second stage involved the random selection of 30 percent of yam farmers in each community. 30, 27, 31, 22 and 23 respondents were selected from the five communities respectively. A total of one hundred and 133 respondents were used for this study. Primary data was used for this study. The data were collected by the reseachers and trained enumerators using questionaire complimented with interview schedule.

Data analysis. Descriptive statistics which comprises percentages, means and frequency counts was used to analyze the data. Pearson Product Moment Correlation was used to test for the hypothesis.

RESULTS AND DISCUSSIONS

Socio-economic characteristic of yam farmers. Table 1 showed some socio economic characteristics of respondents. The average age of respondents was approximately 52 years. This implies that the farmers were in their productive age. Result further shows that majority of the respondents (90.2%) were males (90.2%). Married (91.7%), had farming as primary occupation (65.4%) with 35.3% of the respondents having primary occupation. This implies that men are more in yam cultivation probably because of its labour intensive nature. Also, majority being

married may enhance the availability of family labour for yam cultivation. Ayoola (2012) found out that availability of family labour may reduce the cost of yam production. Majority (83.5%) of the respondents belonged to rural association. This implies that most farmers in the study area had access to information through farmers' organizations. 66.2% of the farmers had an average household size of 5 indicating the presence of a substantial intra household demand for yam as a food and income security. This may influence respondents' preference of a more productive variety. Furthermore, majority (72.9%) had an average farm size of 2 hectares. This implies a relative small farm size which may limit farmers to the cultivation of a single variety of yam on the available plot. Tenure by inheritance was the common form of land ownership in the study area as (74.4%) of the respondents inherited land from their progenitors. Respondents' in the past six months did not have any form of contact with extension agents.

Preference of Indigenous Yam Varieties. Table 2 shows that White yam (*D. rotundata*) was the most preferred choice of respondents, closely followed by White guinea yam (*Dioscorea spp*), Aerial yam (*D. bulbifera*) in descending order. The preference of White yam (*D. rotundata*) and White guinea yam (*Dioscorea spp*) stems from excellent taste and their usefulness for several types of food: pounded, prepared, peeled and dried yam which responds to diverse needs of consumers. Moreover, adaptation to poor soils, resistance to pest and diseases, market value, number of harvest per year, rate of sprouting, storability, colour of root flesh, smoothness of the root skin, and weight of tuber were some of the reasons given by respondents for the preference of these varieties over others. The varieties also have high reproductive capacities and can be grown on several type of mounds, ridges or heaps. They are also adapted to most forms of farming systems. The crop provides a lot of opportunities to mitigating food security and poverty issues. This agrees with Bancroft (2000), Aidoo (2009) and IITA (2001) that white yam (*D. rotundata*) is mostly preferred to other yam varieties as result of many attributes that some yam varieties do not possess.

Sources of Information on Improved Yam Variety Cultivation. Table 3 showed that majority (94.7%) of the respondents got information on improved yam variety from radio. This may be due to affordability and ease of operation of radio by farmers. Moreover, some radio programmes were aired using indigenous language. This finding agreed with Pelemo *et al.* (2019) who reported that radio was the major sources of information to yam farmers in Kogi State, Nigeria. The findings also revealed that 87.2% of the respondents reported fellow farmers as source of information and 77.4% of the respondents reported that family was their source of

information. This may due to the fact that many of the yam farmers were members of farmers group where information is being shared regularly. Similar finding by Tsado *et al.* (2018) stressed that that radio and other farmers were the major sources of information available to farmers in Niger State of Nigeria. A few (19.5%) claimed print media was their source of information on improved yam variety cultivation.

TABLE 1. Distribution of the respondents by their socio-economic characteristics (n=133)

Variables	Frequency	Percentage (%)	Average
Age (years)			
≤ 32	2	1.5	
32-41	26	19.5	
41-50	29	29.3	52.29
> 50	66	49.7	
Sex			
Female	13	9.8	
Male	120	90.2	
Marital status			
Married	122	91.7	
otherwise	11	8.3	
Level of Education			
Non formal	46	34.6	
Primary education	47	35.3	
Secondary education	33	22.6	
Tertiary education	10	7.5	
Household size			
≤ 3	29	21.8	**5 persons**
4-7	88	66.2	
> 7	16	12.0	
Primary occupation			
Farming	87	65.4	
Otherwise	46	34.6	
Farm experience (years)			
≤10	2	1.5	**23 years**
11-20	52	39.1	
21-30	55	41.4	
>30	24	18.0	
Farm size (hectares)			
≤ 2	97	72.9	**1.9 hectares**
3-4	36	27.1	
Land ownership			
Inheritance	99	74.4	
Lease	27	20.3	
Purchase	7	5.3	
Annual income (#000)			
≤30000	68	51.1	
30001- 60000	61	45.9	33,030.07
> 60000	4	3.0	
Membership of rural Association			
Yes	111	83.5	
No	22	16.5	
Extension contact			
No contact	133	100	
Total	133	100	

TABLE 2. Distribution of the respondent by preference for indigenous yam varieties (Source: Field survey,2020)

Variety	Local Name	Frequency	Percentage	Rank
White yam (*Discorea rotundata*)	Alemusu	125	94.0	1st
White guinea yam (*Discorea spp*)	Ehuru	118	88.7	2nd
Aerial yam (*Discorea bulbifera*)	Ekumo	114	85.7	3rd
Gambari (Local variety)	Gambari	108	81.2	4th
Odoo (local variety)	Odoo	107	80.5	5th
Areyin (Local variety)	Areyin	101	75.9	6th
Yellow yam (*Discorea cayenensis*)	Igangan	93	69.9	7th
Ajimokunni (local variety)	Ajimokunni	92	69.2	8th
Chinese yam (*Discorea esculanta*)	Isiru	88	66.2	9th
Water yam (*Discorea alata*)	Ewura	86	64.7	10th

*Multiple responses

TABLE 3. Distribution of the respondent by sources of information on improved yam varieties cultivation (Source: Field survey,2020)

Sources of information	Frequency	Percentage	Rank
Radio	126	94.7	1st
Fellow farmers	116	87.2	2nd
Family	103	77.4	3rd
Television	73	54.9	4th
Print media	26	19.5	5th

Constraints to Indigenous Yam Cultivation. Results in Table 4 showed that bulkiness of yam tubers ($\bar{X}$=3.47) is the most severe of the myriads of constraints respondents faced in the study area. This coupled with lack of access road to farm ($\bar{X}$=3.33), inadequate capital ($\bar{X}$=3.31), lack of appropriate storage structure ($\bar{X}$=3.18) and difficulty in mechanization of operations ($\bar{X}$ =3.14) are some of the severe challenges faced by respondents in the study area. This finding is in consonance with Migap and Audu (2012) who reported that inadequate capital and poor road network were some of the constraints to yam production in Nigeria. Pest and diseases in both field and storage constitute a major challenge in yam production (Zaknayiba &Tanko, 2013). Inadequate staking material could increase cost of yam production especially in areas where live stakes or crop stakes are not present in the farm for trailing of the vines. Emmanuel (2017) posits that staking could double the cost of yam production. High cost of seed yam increases the overhead cost of production and reduces profit margins of yam farmers.

Result of Pearson product moment correlation. Results in table 5 show the result of the correlation analysis between selected socio-economic characteristic of farmers' and their preference for indigenous yam variety. Result shows that age (r= 0.180, p<0.05), (r= 0.298, p<0.01), Monthly income (r= 0.222, p<0.05), (r= 0.196,

p<0.05) significantly influence respondents preferences for white guinea yam and white yam indigenous varieties respectively. Household size (r= 0.182, p<0.05), influences respondents choices of Gambari. On the contrary, the negative influence of membership of rural association (r= -0.171, p<0.05) on the choice of indigenous yam variety implies that respondents preferences for those varieties, decreases as they join more rural associations. Rural farmers' association has been shown to influence the decisions of members.

TABLE 4. Distribution of the respondent by constraint to indigenous yam cultivation (Source: Field survey,2020)

Constraints	NC	NS	S	VS	Mean	Rank
Bulkiness of yam tubers	0(0.0)	7(5.3)	56(42.1)	70(52.6)	3.47	1st
Lack of access road to farm	0(0.0)	14(10.5)	61(45.9)	58(43.6)	3.30	2nd
Inadequate capital	4(3.0)	21(15.8)	38(28.6)	70(52.6)	3.31	3rd
Lack of appropriate storage structure	0(0.0)	17(12.8)	74(55.6)	42(31.6)	3.18	4th
Difficulty in Mechanization of operations	10(7.5)	17(12.8)	60(45.1)	46(34.6)	3.14	5th
High cost of seed yam	6(4.5)	34(25.6)	59(44.4)	34(25.6)	2.90	6th
Low price of tubers at harvest	1(0.8)	39(29.3)	68(51.1)	25(18.8)	2.87	7th
Lack of improved varieties seedlings	2(1.5)	43(32.3)	60(45.1)	28(21.1)	2.85	8th
Decreasing soil fertility	11(8.3)	33(24.8)	64(48.1)	25(18.8)	2.77	9th
Unavailability of yam sett	6(4.5)	39(29.3)	74(55.6)	14(10.5)	2.72	10th
Inadequate staking material	9(6.8)	38(28.6)	68(51.1)	18(13.5)	2.71	11th
Pest attack on the field	2(1.5)	52(39.1)	61(45.9)	18(13.5)	2.71	11th

Table 5: Pearson product moment correlation between the socio-economic characteristics of the yam farmers and their preference for indigenous yam variety ((Significance level of $p \leq 0.05$)

Socio-economic Characteristics	Yellow yam	Aerial yam	White guinea yam	White yam	Water yam	Chinese yam	Gambari	Odoo	Areyin	Ajimokunni
Age	-0.067	0.120	**0.180***	**0.298****	0.020	-0.010	0.033	0.074	0.097	-0.087
	0.444	0.168	**0.038**	**0.000**	0.818	0.905	0.706	0.395	0.268	0.321
Marital status	0.026	-0.006	**0.256****	-0.041	-0.023	0.088	0.097	-0.079	0.016	-0.023
	0.763	0.941	**0.003**	0.638	0.797	0.313	0.268	0.365	0.857	0.797
Primary occupation	0.001	0.075	0.013	-0.006	0.113	0.065	0.166	-0.044	0.053	0.003
	0.990	0.393	0.879	0.948	0.194	0.455	0.057	0.618	0.548	0.977
Monthly income	0.146	-0.134	**0.222***	0.009	-0.083	**0.196***	-0.090	-0.127	-0.040	-0.078
	0.094	0.125	**0.010**	0.920	0.340	**0.024**	0.302	0.145	0.651	0.370
Membership of association	0.088	-0.052	0.023	-0.017	0.109	0.031	-0.050	**-0.171***	-0.077	-0.081
	0.313	0.553	0.789	0.847	0.214	0.720	0.566	**0.049**	0.377	0.355
Household size	-0.098	-0.016	0.062	-0.116	0.034	-0.089	**0.182***	0.134	0.022	-0.032
	0.260	0.851	0.479	0.182	0.695	0.310	**0.036**	0.123	0.804	0.716
Farm size	-0.023	-0.110	-0.049	0.014	0.109	0.042	0.065	-0.011	-0.049	-0.018
	0.796	0.208	0.577	0.874	0.212	0.632	0.455	0.904	0.577	0.841

CONCLUSIONS

The study concluded that White yam (*Dioscorea rotundata*) was the most preferred choice of respondents, closely followed by White guinea yam (*Dioscorea*

spp), Aerial yam (*Dioscorea bulbifera*). The most constraints faced by yam farmers in the study area were bulkiness of yam tubers, lack of access road and inadequate capital. It is recommended that there should be increased awareness on new yam varieties and improved method of cultivation to enhance increased productivity. Moreover, Storage facilities for root and tuber should be made available for farmers to discourage wastage of tubers. Furthermore, Farms should be opened up with accessible roads to facilitate easy transportation of farm produce most especially bulky ones like yam tubers.

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