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Economics and Consumption Pattern of Bitter Yam (*Dioscorea dumetorum*) among Rural Households in Emuoha Local Government Area of Rivers State

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ABSTRACT

The study examined the socio-economics of three leafed yam (*Dioscorea dumetorum*) to rural households in Emuoha Local Government Area of Rivers State. Structured interview schedule was the instrument used to get information from 100 bitter yam farmers from ten communities using the simple random sampling technique. Data collected were analysed using the descriptive statistics and cost benefit ratio. The result reveals that majority of the respondents are females (52%), married (60%), between the ages of 41-50 years (42%), had First School Leaving Certificate (FSLC) and have been farming bitter yam for over 12 years (42%). The cost benefit ratio is 1.79, indicating a profit of ₦0.79 for every ₦100 invested in bitter yam production. The rural households prefer eating boiled bitter yam with otazi leaf. The constraints to bitter yam production include lack of capital ($x = 3.15$), infection of bitter yam by beetle ($x = 3.00$), spoilage/rottenness of bitter yam ($X=2.73$) and flooding of farms ($x=2.63$). The study therefore, recommended that technologies on how to prevent beetle from attacking bitter yam and how to prevent spoilage of bitter yam should be disseminated to farmers and rural households should be encouraged to go into bitter yam farming as a source of livelihood since it is a profitable venture.

INTRODUCTION

Bitter yam (*Dioscorea dumetorum*) also known as three leafed yam is among the yam family that belongs to the genus *Dioscorea* and family *Diocoreaceae* (Bai and Ekanaayake, 1998). There are other names for bitter yam which include trifoliolate (three leafed) yam and cluster yam. Bitter yam is called 'ji una or ji ona by Ojoto and some Igbo speaking communities or areas or towns in the south-eastern states in Nigeria while in Emohua Local Government Area of Rivers State, it is called ele-he-lu (White bitter yam), nkpu-ta-nkpu (Purple bitter colour) and ngwa Benin (Yellow bitter yam). They are generally called ele-he-elu in Ikwerre speaking language. It is usually since as a food mainly for adult. In the study area, bitter yam also serves as food for the diabetic patients and as herb for the treatment of various ailments such as elipsy. In the south-western Nigeria, bitter yam is used in the treatment of malaria (Dike, Obembe and Adebisi, 2012) which indicates that bitter yam has ethno-medicinal benefits to the rural people. Bitter yam is rich in phyto-nutrients, including proteins (Medoua, Mbome, Agbor-Egbe and Mbofung, (2005); Alozie, Akpanabiatu, Eyong, Umoh and Alozie, 2009), yet it is among one of the most uncultivated tropical tuber (Enujiughu and Ayodele-oni, 2003). In spite of the numerous potentials found in using bitter yam in bakery, homes and pharmaceutical industries (Musieba, Okoth, Mibey, Wanjiku and Moraa, 2013). The state and nation are faced with the problem of inadequate food supply because of government over reliance on oil, land degradation as a result

of oil activities and the attendant malnutrition problem in the rural areas necessitated the study with the aim of finding how food supply could be increased and be available for people to utilize them.

The white colour does not stay long after harvesting but the rest can stay longer. The most preferred one is the white coloured bitter yam. However it could not be kept overnight. It has to be harvested and eaten under 24 hours. But the yellow and purple specie bitter yam could stay as long as the farmer wants. It can be harvested and kept in the house for one to two weeks. However, they are not preferred by rural households. Another limitation of the use of bitter yam is the unpalatable bitter taste and high post-harvest hardening nature of the tubers (Medoua, Mbome, Agbor-Egbe and Mbofung, 2005). High post-harvest hardening of tubers could be prevented by drying and milling bitter yam into flour. In this regard, it is necessary to survey bitter yam production among rural farmers in Rivers State and investigate simple methods of how to improve on the traditional method of drying and milling. The specific objectives were to:

- 1) determine the socio-economic characteristics of respondents;
- 2) calculate the cost-benefit ratio of bitter yam;
- 3) determine the socio benefits of bitter yam to rural farmers and
- 4) ascertain the constraints to bitter yam production in the study area.

METHODOLOGY

The major occupation of the people of Emohua is farming such as yam, cassava, three leaf yam, vegetable, pepper, okro, and cocoyam. Emohua is made up of 21 communities. Ten communities were purposively selected from the LGA. This was based on the highest number of farmers who produce bitter yam. The selected communities were: Egbeda, Omudioga, Ubinin, Ibaa, Rumuji, Ndele, Ovogo, Npremini, Ogbakiri and Itue. From each of the selected communities, a proportionate number of 10 bitter yam farmers were randomly selected, giving a total number of 100 bitter yam farmers. A well-constructed structured interview schedule was used for relevant data collection. Data collected were analyzed through the use of mean statistics, percentages and cost benefit ratio.

RESULTS AND DISCUSSION

Table 1 reveals that a higher percentage (42.0%) of the respondents was in the age bracket of 41-50 years, was females (52%) and married (60%). The mean year of 42.2 years indicates that the respondents were still young and active and in their productive stage, females are more in bitter yam production and they are responsible men and women. Also, majority (57%) of the respondents had First School Leaving Certificate (FSLC) and have been farming bitter yam for over 12 years (42%) indicating low literacy level in the study area however, they have enough experience in bitter yam farming. The mean year of farming is 12 years.

Table 1: Socio-Economic Characteristics of Respondents

Variables	Frequency	Percentage	Mean
Age (Years)			
20 - 30	10	10.0	
30 – 40	35	35.0	
40 – 50	42	42.0	
50 – 60	6	6.0	44years
60-70	5	5.0	
Above 70	2	2.0	
Sex			
Male	52	52.0	
Female	48	48.0	
Marital status			
Single	60	60.0	
Married	30	30.0	
Divorce /Separated	7	7.0	
Widow/Widower	3	3.0	
Educational level			
No Formal Education	18	18.0	
FSLC	57	57.0	
SSCE/WAEC	25	25.0	
OND/NCE	-	-	
HND/B.Sc /B.Ed	-	-	
Years of Farming			
0 – 2	-	-	
2 – 5	16	16.0	
6 – 8	12	12.0	12years
8- 12	30	30.0	
Above 12	42	42.0	

Source: Field Data, 2015

Cost Benefit Ratio for Bitter Yam Production

Cost of Production

Fixed cost

Land Inherited/leased for one

Variable Cost

Cost of labour -----Family Labour

Cost for clearing land ----- ₦4500

Cost of bitter yam seedlings ----- ₦1500 for 10 tonnes x 8 plots of land(1 hectare) = ₦12000

Total Cost of Production ----- ₦16500

Revenue

One heap(10tonnes) of 50 sold for ----- ₦3500 x 10 = ₦35000

Gross Margin Profit = Total Revenue – Total Cost

= ₦35000 - ₦9500 = ₦16000

Cost Benefit Ratio = Total Revenue (TR) TR = ₦35000

$$\begin{aligned} \text{Total Cost (TC)} &= \text{TC} = \text{₦}19500 \\ &= \frac{\text{₦}35000}{\text{₦}19500} \\ &= 1.79 \end{aligned}$$

The above result shows that a total cost of ₦19500 was required to produce 10 kilogrammes to 50 kilogrammes of bitter yam. This gave ₦35000 when a heap of 50kg is sold for ₦3500. The total revenue is ₦35000. This gave a profit of ₦16000 indicating that bitter yam production is a profitable venture. Also, the net return for bitter yam production is ₦35000 in Emohua LGA of Rivers State. Furthermore, the cost benefit ratio shows that for every ₦100 invested in bitter yam production, a profit of ₦0.79 is returned. This shows that the business is profitable.

Perceived socio benefits of Bitter Yam production

Table 2 shows that a little above half (51%) of the respondents perceived that the socio benefits of bitter yam production to the rural dwellers is that it is very cheap to buy followed by 40% of the respondents who say it is a source of livelihood and 12% said it is very good for diabetic patients.

Table 2: Percentage Distribution of Types of bitter yam cultivated

Benefits	Frequency	Percentage
Good for diabetes (medicinal)	12	12.0
Very cheap to buy	51	51.0
Very easy to plant and harvest	4	4.0
Is a source of business	40	40.0

Source: Field data, 2015

Consumption pattern of Bitter yam among rural women

Entries in Table 3 show that most of the respondents' preferred boiled bitter yam. However, majority (80.4%) of the respondents liked eating the boiled bitter yam with vegetable (otazi leaf) while 60.3% eat boiled bitter yam with palm oil mixed with potash. Bitter yam is an accepted food crop among rural women and it has different ways in which it could be prepared an eaten by rural women.

Table 3: Consumption pattern of bitter yam

S/N	PATTERN	PERCENTAGE
1	Boiled with salt, palm oil and pepper	30.0
2	Boiled with salt, palm oil and potash	60.3
3	Boiled with salt and stew	25.1
4	Boiled with pepper soup	10.5
5	Roasted with palm oil, salt and pepper	13.0
6	Boiled with salt, cowpea, palm oil and otazi vegetable	7.0
7	Roasted with salt/cowpea/palm oil and otazi vegetable	5.0

Source: Field data, 2015

Constraints to Bitter Yam Production

The constraint to bitter yam production is shown in Table 3. From Table 3, using a mean score of 2.50 as the decision rule, out of the seven variables given for respondent to react, only four of the variables were accepted as constraints to three leaf yam or bitter yam production. They lack of capital ($x = 3.15$), infection of bitter yam by beetle ($x= 3.00$), spoilage/rottenness of the yam ($X=2.73$) and flooding of farms ($x=2.63$). This implies that lack of capital; insect's infection and flooding were the major constraints to bitter yam. This agrees with Albert and Ekine (2012) who observed that lack of funds was a major constraint to the development of rural business in the state.

Table 3: Mean Distribution of constraints to bitter yam production

Constraints	Strongly Agreed (4)	Agreed (3)	Disagreed (2)	Very Strongly Disagreed (1)	Total Score	Mean X	Remarks
Low patronage	20	25	20	6	186	1.86	Reject
People are not aware of bitter yam	25	22	10	9	195	1.95	Reject
Low educational level of farmers	2	3	31	30	109	1.09	Reject
Flooding of farms	30	35	15	8	263	2.63	Accept
Spoilage/rottenness of the yam	32	36	15	7	273	2.73	Accept
Lack of capital	35	40	20	15	315	3.15	Accept
Infection by yam beetle	35	38	17	12	300	3.00	Accept

Source: Field data, 2015

CONCLUSION AND RECOMMENDATION

Bitter yam was mostly cultivated by women in the study area. The white specie of bitter yam was the most preferred one by the people in the study area. They liked eating bitter yam when it was boiled with salt and otazi leaf. Investing in bitter yam was a profitable venture that rural dwellers could embark on and make a living out of it. However, the rural women had the challenge of spoilage of the bitter yam.

Based on the findings from the study, it was recommended that training and workshops should be organized for bitter yam farmers to teach new technologies and techniques on how to preserve bitter yam in order to reduce/stop spoilage of bitter yam.

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