Involvement of Farm Households in Bush Buck (*Gongronema latifolium*) Production in Anambra State, Nigeria

A. I. Emodi[1*], C. C. Akwue[1] and E. O. Ehebha[1]

[1]*Department of Agricultural Economics and Extension, University of Port Harcourt, Port Harcourt, Nigeria.*

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final Manuscript.

Original Research Article

ABSTRACT

The study assessed the involvement of farm households' in bush buck (utazi) production in Agricultural zones of Anambra State, Nigeria. Using multistage sampling technique, a total of 100 household heads were purposively selected from the four Agricultural zones (Aguata, Awka, Onitsha and Anambra) in the State. Primary data was collected with structured questionnaire and analyzed using descriptive statistic such as mean, frequency count and percentage. It was found that the mean age of the farmers was 42 years. Greater proportions (72.5%) of the respondents were males, 73.5% married, with mean farming experience of 12years. The mean household size was 5 persons, with annual mean income of ₦50.000. Many of them (58.8%) had a mean farm size of 0.06-0.13 hectares. While 63.8%of them used both family + hired labour in production of bush buck, 75.2% of the farmers produced bush buck commercially. The agronomic activity most perceived by farmers as important in bush buck production was harvesting ($\bar{X}$ =3.79). Their major

_____

Corresponding author: E-mail: emodizee@gmail.com;
Email: e.ehebha@gmail.com;

constraints in the production of bush buck were pests and diseases ($\overline{X}$ = 3.10), and weed infestation ($\overline{X}$ =3.01), while their major extension need was provision of information on control of pests and diseases ($\overline{X}$ = 3.24). It was recommended that extension agents should disseminate information to the farmers and enlighten them on management of pests and diseases in bush bucks production.

1. INTRODUCTION

Bush buck (*Gongronema latifolium)* is an annual creeping climbing shrub which belongs to the family plant known as *Asclepiadaceae*, It is one of the most important non-wood forest products in Nigeria. Bush buck is mostly found in the south eastern part of the country where it is mostly eaten uncooked with other food preparation like African salad (*Ugba*), roasted plantain with fish (*Bole*) [1]. It is also characterized by a delicate aroma which it contributes to the food which has made many households to persistently use it (*utazi*) as their vegetable for various *cuisines*. According to [2], it is a Nigerian dietary vegetable attributed with medicinal properties, among important vegetables of South west Nigeria. It is widely used for culinary and medicinal purposes in Nigeria Apart from its value as vegetable, bush buck has vast medicinal attributes especially its leaf extract used in the treatment of many ailments like stomach upsets, typhoid and boosting appetite, etc. [1,3]. The plant exhibits the following herbal actions, such as: antitumor, anti-asthmatic, wide spectrum antimicrobial (antiviral, antibacterial, antiparasitic and antifungal), analgesic, mild expectorant, antioxidant, anti-sickling, hypolipidemic, anti-inflammatory, antiulcer, antipyretic, hypoglycemic, hepatoprotective, laxative properties and digestive tonic [4], It is equally taken as tonic to treat loss of appetite [5]. He further noted that bush buck contains anti-oxidant, anti- pyretic properties and show activities against staphylococcus.

The importance of Bush buck (*Gongronema latifolium*) cannot be underestimated because of its nutritional and medicinal values. It has the potentials to improve the livelihood of the rural farmers if well explored for its medicinal value. Bush buck seems to have high potentials for employment generation, income generation and poverty reduction. Unfortunately, these potentials in non-forest products such as bush buck have remained largely unexplored among households. The quality and quantity of bush bucks harvested and sold over the years cannot be compared with the numbers of farm household involved in its production. This can be attributed to pest infestation, over production, low shelf life of the vegetable. Farm households abandon local herbs and spices such as bush buck for foreign spices with little or no health benefits. The foreign spices are imported as processed into the country. In the cause of processing, most had lost their natural nutrients especially the water soluble vitamins such as vitamins C and E which are very important antioxidant. These seem to affect the health of the rural dwellers resulting to nutrition deficiency and human malnutrition. This has led to diseases such as cough, catarrh, tooth ache, dysentery and so on.

Bush bucks are predominantly harvested from the wild. However, like many other non-wood forest products they are constantly plagued by deforestation, excessive exploitation and constant expansion of the urban areas into rural areas. These activities results to early harvesting and speedy disposal of non-wood forest products to avoid spoilage. In vegetable glut, it results in heavy slash in prices by the farmers. Consequently, results in farmers low income earning, poor standard of living, and discouragement in bush buck cultivation. Neglecting the cultivation and utilizations of bush buck, discourages farmers that are engaged in the production of other non-timber products such as piper guineense **(***uziza),* Gnetum-Africanum (*Okazi)*. Extinction of bush buck will make our next generation not to partake in bush buck nutritional and medicinal benefits. There will also be loss of skills and income generated from the plant.

From this backdrop, the study seeks to ascertain the involvement of farm households in bush buck (*Gongronema latifolium*) production in Anambra State Agricultural Zones of Nigeria. It is therefore necessary to ascertain the involvement of farm households in bush buck (*Gongronema latifolium*) production in Agricultural Zones of Anambra State, Nigeria. Specifically, the study

ascertain the agronomic activities in bush buck production: identify extension needs of farm households for bush buck production; identify the activities of farm households in bush buck production: and ascertain constraints to production of bush buck among farm households.

2. METHODOLOGY

The study was carried out in Anambra State, Nigeria. The present Anambra State is a product of 1991 State creation in Nigeria, out of the former Anambra State. The State is located on latitude 5º8º and 6º10º North and longitude and East. It shares a boundary with Enugu and Kogi States in the North, Delta State in the South, Edo State in the West and Imo and the Abia States in the East [6], It occupies an area of about 4,885 square kilometers with a population of 4,177,828 people [7]. Anambra State is made up of twenty one Local Government areas grouped into four Agricultural Zones. The State is predominantly rural with subsistence farming as their major source of livelihood, though over the years they have also diversified into trading and non-farm activities [6]. The main vegetable productions are bush buck (*utazi*), Piper guineense (*uziza*), basil (scent leaf /*nshanwu/alulu*), spinach (*ngbolodi-oyibo*), amarathus(*inine*), pumpkin (*ugu*).

The state has twenty-one Local Government Areas grouped into four agricultural zones (Aguata, Awka, Onitsha and Anambra). The population of the study comprised all farm households in the Four Agricultural Zones of Anambra State (See Table A). Purposive and multi-stage sample techniques were used in the sample selected for the study. In the first stage, all the four (Aguata, Awka, Onitsha and Anambra) Agricultural Zones were purposively selected on the basis of the existence of bush buck production in the areas. In the second stage, from the existing Agricultural Development Programmes (ADP) structure in the state-zone, block and circle, one extension block was purposively selected from each Agricultural Zone (Orumba North from Aguata zone, Njikoka from Awka zone, Ogbaru from Onitsha zone and Ayamelum from Anambra zone), because of the high rate of bush buck production, giving a total of four blocks. In the third stage, 5 extension circles were randomly selected from each block, giving a total of 20 extension circles. Finally, 5 heads of households were purposively selected from each extension circle for the study, based on their active involvement in bush buck production. A total of one hundred (100) heads of households were selected for the study. Only eighty (80) copies of questionnaire which were correctly filled by the farm households were used for the analysis.

Data for the study was collected from primary source *with structured questionnaire.* Descriptive statistics was used to analyze the data collected. Descriptive statistics involved the use of frequency count, percentage, mean and a four-point Likert scale in data analysis. The four-point type Likert scale was weighed as follow**s**: Very important-4, Important-3, Less important-2 and Not important-1. The following decision was used:

$\overline{X}$ 1.00 - 2.49   Low
$\overline{X}$ 2.50 – 3.49   High
$\overline{X}$ 3.50 – 4.49   Very high

This means that any mean score of less than 2.50 was regarded as not important

TableA. Distribution of Anambra State's twenty one Local Government Areas under the four agricultural zones

Onitsha zone	Anambra zone	Awka zone	Aguata zone
Onitsha North	Anambra East	Dunukofia	Orumba South
Onitsha south	Anambra West	Aniocha	Orumba North
Ogbaru	Ayamelum	Awka North	Nnewi South
Ekwusigo	Oyi	Awka South	Nnewi North
Ihiala		Njikoka	Aguata
Idemili North			
Idemili South			

Sources: [8].

Fig. 1. Map of Anambra state

Fig. 2. Bush buck (*Gongronema latifolium*)

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of the Respondents in Bush Buck Production

Results in Table 1 shows that the majority (72.5%) of respondents were males, mean age was 43 years, large proportion (73.5%) were married, 77.7% were literate, and 50.0% were farming, with mean farming experience of 12 years. Greater proportion (60.5%) of the respondents had household size of 4-7 persons. About 48.8% of them had an annual income of ₦50.000, 63.8%of them used both family + hired labour in production of bush buck. The finding shows that greater proportion of the farmers' use combination of family + hired labour for

4

farming activities. This could make for easier reach and faster activities in the farm. This agrees with [9], who reported that family labour is becoming inadequate in farm production; hence most farm households hire labour in farm management.

Table 1. Percentage distribution of farmers socioeconomic characteristics in Bush buck production

Variables	Frequency (n=80)	Percentage (%)	Mean ($\bar{X}$)
Sex			
Female	58	72.5	
Male	22	27.5	
Age (years)			
20-29	13	16.2	
30-39	13	16.2	
40-49	31	38.8	43 years
50-59	16	20.0	
60 and above	7	8.8	
Marital Status			
Single	2	2.8	
Married	58	73.5	
Divorced	2	2.2	
Widowed	18	21.5	
Level of education			
No education	18	22.5	
Primary education	29	36.3	
Secondary education	28	35.0	
Tertiary education	5	6.2	
Primary occupation			
Farming	40	50.0	
Civil servants	11	13.8	
Traders	29	36.2	
Farming experience (years)			
1-5	10	12.5	
6-10	24	30.0	
11-15	26	32.5	12 years
16-20	12	15.0	
21 and above	8	10.0	
Household size			
1-3 persons	22	28.3	
4-7 persons	49	60.5	5 persons
8 and above persons	9	11.2	
Family annual income (₦)			
50, 000 and above	39	48.8	
51,000 -60,000	18	22.5	
61,000 – 70,000	14	17.5	
71,000 and above	9	11.2	
Source of labour			
Family	20	25.3	
Hired	9	10.9	
Both	51	63.8	
Purpose of production			
Sales	60	75.0	
Family consumption	17	21.2	
For local herbs production	3	3.8	

Source: field work, 2016

Greater proportion of the farmers (75.0%) main purpose for bush bucks production is to generate income. This finding corresponds with [1], who reported that bush buck (*utazi*) is produced mainly for sales and typically consumed fresh in south-eastern Nigeria.

The results clearly show that majority of the farmers earned low family annual income. This might be discouraging the farmers for continuity in production of bush buck (*Utazi*). It might lead to some of the farmers abandoning bush buck (*Utazi*) production to cultivation of other agricultural produce. It is pertinent to note that this might be part of the reason why underutilized vegetables go extinct. The findings revealed that females were more involved in bush buck (*Utazi*) production in the study area. This finding agrees with [10], who reported that women are the key players in the production of vegetables, as they are mostly involved in indigenous vegetables such as *Utazi* (bush buck). Most of the farmers were experienced adult farmers who could make decisions and were in their middle age, full of energy and active. The finding is in line with [11], who reported that most farmers are below fifty years of age. Farm households seemed to believe in marriage and large families for effective distribution of farm labour. The result corresponds with [12], who identified the rural farmers as married, with large family size, since most of them depend on family labour for their agricultural activities.

Literacy level of farmers is vital in dissemination; adoption of innovation and technical efficiency [13,6], This aligned with [6], who stated that education play positive role in farmers' adoption of innovation; through education communication, skills, attitude and changes are attained in agricultural production. The results revealed that vegetable production, especially *Utazi* seem a viable source of their income generation. To Ajani and [14], rural dwellers have different sources of income in order to cater for the needs of the family.

3.2 Agronomic Activities in Bush Buck Production

Data in Table 2 show that 10 items out of the 12 investigated were perceived by farmers as important in bush buck production. These include: land acquisition ($\bar{X}$=3.10), land clearing ($\bar{X}$=3.00), bed/ridge making ($\bar{X}$=2.99), planting ($\bar{X}$=3.73), pests and diseases control ($\bar{X}$=2.58), weeding ($\bar{X}$=2.70), fertilizer/agro-chemical application ($\bar{X}$=2.57), Harvesting ($\bar{X}$=3.79), storage ($\bar{X}$=2.81) and marketing ($\bar{X}$=3.72). The farmers rated water management ($\bar{X}$=2.48) and nursery preparation ($\bar{X}$=2.27), less important activity in bush buck production.

The findings show that the farmers are involved in harvesting as the most important agronomic activity performed in bush buck production. Farmers participate in land acquisition not only for bush buck production, but for cultivation of other additional vegetables such as fruited pumpkin, amaranthus, vine spinach, okra and cocoyam. Bed/ridge making help stir the soil in the farm. It also makes for adequate moisture and drains out excess water for the plant root to grow well. The findings revealed that farmers were involved in control of pest and diseases, weeding, fertilizer/agro-chemical application, harvesting and marketing of bush buck. Bush buck are planted through stem propagation. Planting is carried out seasonally by the farmers, especially at the beginning of the raining season. Based on the findings, it seems safe to conclude that bush buck propagation through the stems take some time for growth. The seeds are not ease to come by in young growing plant.

3.3 Participation of Household Members in Bush Buck Production

Table 3 shows that males were more involved in activities like land preparation, provision of planting inputs, stalking, and control of pests and diseases. The females and children are seen to be more engaged in activities like planting, weeding, and sales of the bushbuck, while harvesting is mostly done by all members of the households.

The finding shows that 50.0% of respondents' farmlands are family owned, 38.8% inherited their farmlands, 7.5% respondents got their farmlands as a gift from friends or relatives and only 3.0% farmlands were purchased. This indicates that majority (50.0%) of rural farmers' use family owned lands for farming. This implies that less would be spent in purchase of farm land since most family lands in the study area are by inheritance.

Table 2. Mean distribution of agronomic activities that are involved in bush buck production among farmers

S/N	Agronomic activities	Mean ($\bar{X}$)
1	Land acquisition	3.10
2	Land clearing	3.00
3	Bed/ridge making	2.99
4	Nursery preparation	2.27
5	Planting	3.73
6	Pests and diseases control	2.58
7	Weeding	2.70
8	Water management	2.48
9	Fertilizer/agro-chemical application	2.57
10	Harvesting	3.79
11	Storage	2.81
12	Marketing	3.72

Source: Field work, 2016; mean ≥2.5= Accept

Table 3. Participation of household members in bush buck production

Farmland ownership	Frequency(n=80)	Percentage (%)
Gift	6	7.5
Inherited	31	38.8
Family owned land	40	50.0
Outright purchase	3	3.7
Source of inputs		
Father	47	58.8
Mother	33	41.2
Children	-	-
All	-	-
Preparation of land		
Males	37	46.2
Females	12	15.0
Children	10	13.0
All	21	25.8
Planting bush buck		
Males	10	12.5
Females	44	55.1
Children	9	11.2
All	17	21.2
Staking of bush buck		
Males	44	55.0
Females	15	18.8
Children	10	12.4
All	11	13.8
Farm weeding		
Males	12	15.0
Females	35	43.8
Children	14	17.5
All	19	23.8
Pests and diseases management		
Males	40	49.3
Females	13	16.2
Children	10	12.5
All	17	22.0
Marketing of bush buck		
Males	6	7.5
Females	26	32.5
Children	25	31.2
All	23	28.8

Source: Field work, 2016

3.4 Perceived Constraints to Bush Buck Production in the Study Area

Table 4 reveals that respondents were of the view that the major constraints encountered by farm households in the production of bush buck are pests and disease attack ($\overline{X}$ = 3.10), weed infestation ($\overline{X}$ =3.01), limited extension services ($\overline{X}$ =2.99), post-harvest losses ($\overline{X}$ =2.96), low yield ($\overline{X}$ = 2.53), poor soil fertility ($\overline{X}$ = 2.54).

However, the less constraints faced in bush buck production by farm households include: inadequate capital ($\overline{X}$ = 1.65), limited capital ($\overline{X}$ =1.70), shortage of labour ($\overline{X}$ =1.75), shortage of irrigation water ($\overline{X}$ = 1.99), poor environmental conditions ($\overline{X}$ = 2.01), limited marketing opportunity ($\overline{X}$ = 2.31), ill health ($\overline{X}$ = 2.53) and limited access to market ($\overline{X}$ =2.41). This finding agrees with [15], who mentioned that constraints faced by vegetable farmers are weed infestation ($\overline{X}$ =3.80) and pest attack ($\overline{X}$ = 3.62). This implies that farmers might experience poor yield and reduced harvest due to pest /diseases infestation and poor management. It could be that they do not have knowledge of improved methods of pests/diseases management. This could infer that the farmers might not be aware of the concept of integrated pest management (IPM)

Table 4. Mean distribution on perceived constraints to bush buck production in the study

	Item	Mean($\overline{X}$)
1	limited capital	1.70
2	inadequate land	1.65
3	shortage of labour	1.75
4	limited access to market	2.41
5	limited extension services	2.99
6	poor soil fertility	2.54
7	poor environmental conditions	2.01
8	weed infestation	3.01
9	shortage of irrigation water	1.99
10	pests and diseases attack	3.10
11	limited marketing opportunity	2.31
12	Post-harvest losses	2.96
13	ill health	2.53
14	low yield	2.53

- *mean ≥2.5= constraints*
- *Source: Field survey, 2016*

4. CONCLUSION

Bush buck is highly produced by farm households in agricultural zones of Anambra state. Since finance and farm lands were not major constraints to the production of bush buck, most male farmers participate in land preparation, provision of planting inputs, stalking, and control of pests and diseases. The females and children were more involved in activities such as planting, weeding, and sales of the bush buck. All the farmers participate in harvesting of the bush buck. There is need for proper management of pests and diseases, and post-harvest losses for better production. There is need for the government to increase the activities extension services among farm households. Provision of information on basic techniques to increase production is also needed through effective actions on the part of the extension agents.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ugochukwu NH, Babady NE, Cobourne M, Gasset SR. The effect of *Gongronema latifolium* extracts on serum lipid profile and oxidative stress of hepatocytes of diabetic rats. Journal of Bioscience. 2003;28(1):2–5.
2. Eleyinmi AF. Chemical composition and antibacterial activity of *Gongronema latifolium*. Journal of Zhejiang University Science B. 2007;8(5):352-358. Available:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1859873/
3. Agbo CU, Baiyeri KP, Obi IU. Indigenous knowledge and utilization of *Gongronema latifolium* Benth: A case study of women in University of Nigeria, Nsukka. Bio-Research Journal. 2005;3(2):66-69.
4. Ihesie GC. Health benefits of *Gongronema latifolium* (Utazi). The Guardian; 2015. Available:http://guardian.ng/features/health/health-benefits-of-gongronema-latifolium-utazi/
5. Opara MN. Some edible spices of Southeastern Nigeria with anti-parasitic properties: A review. American Journal of Ethno-medicine. 2014;1(6):384-392. Available:http:// www ajethno.com (Retrieved on .6th August 2016)

6. Emodi AI. Analysis of rice (*Oryza spp*) innovation system in Southeast Nigeria. Ph.D Thesis, Department of Agricultural Extension, University of Nigeria, Nsukka; 2010.

7. National Population Commission of Nigeria, NPCN (2006), Population figure of Republic of Nigeria, Abuja; 2017. Available:http://www.population.gov.ng/index.php/censusesRetrieved on 23rdJanuary

8. Onwubuya EA, Nenna MG, Ugbaja MO. African Journal of Agricultural Research. 2015;10(12):1421-1426. Available:http://www.academicjournals.org/journal/AJAR/article-full-text-pdf/6BDE17851832

9. Omotesho KF, Azeez Muhammad-Lawal, A, Ismaila DE. Assessment of hired labour use and food security among rural farming households in Kwara State, Nigeria. Journal of Agricultural Sciences. 2014; 59(3):353-361

10. Schippers RR. African indigenous vegetables: An overview of the cultivated species. University of Greenwich, Natural Resources Institute, London, UK. 2000;222.

11. Ekong EW. Group and non group women farmers access to agricultural production responses in AkwaIbom State, Nigeria. Ph.D. Thesis. Department of Agricultural Extension and Rural Development, Ibadan: University of Ibadan; 2000.

12. Jibowo AA. History of agricultural extension in Nigeria. In: S.F. Adedoyin (ed.) Agricultural Extension in Nigeria. Publication of Agricultural Extension Society of Nigeria. 2005;1-12.

13. Amaza PS, Tashikalma AK. Technical efficiency of groundnuts in Adamawa State, Nigeria. Journal of Arid Agriculture. 2003;13:127–1311.

14. Ajani EN, Andigbokwe EM. Promoting entrepreneurship and diversification as a strategy for climate change adaptation among rural women in Anambra State, Nigeria. Journal of Agricultural Extension. 2013;16(2). Available:http://dx.doi.org/10.4314/jae.v16i2.6

15. Edeoghon CO. An assessment of urban women participation in vegetable production in Ovia North East Local Government Area of Edo State, Nigeria. Journal of Agriculture and Veterinary Science (IOSR-JAVS). 2016;9(7):30-35. Available:www.iosrjournals.org, www.iosrjournals

_____

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/22288