

FACTORS AFFECTING THE CULTIVATION OF SELECTED UNDERUTILIZED INDIGENOUS VEGETABLES IN OSUN STATE, NIGERIA

¹Alao O.T., ²Ogunjimi S.I, and ³Ajala A.O

¹Department of Agricultural Economics and Extension, Osun State University, Ejigbo Campus, Osun State alao40@yahoo.com

²Department of Agricultural Economics and Extension, Federal University Oye-Ekiti

³Department of Agricultural Economics and Extension, Landmark University Omu-Aran, Kwara State

Corresponding Author: Email jimisunday@ yahoo.co.uk Telephone +2348035996430

Abstract

This study focused on the factors affecting the cultivation of some selected Underutilized Indigenous Vegetables (UIVs) in Osun State, Nigeria. A multistage sampling procedure was used to select 180 respondents used for the study. Data were collected using validated and pre-tested structured interview schedule. The collected data were analyzed using descriptive and inferential statistics. The results showed that the majority (80%) of the vegetable farmers were women with household sizes of 1-5 members and farm sizes below an acre. The majority of the farmers cultivated UIVs such as *Telfairia occidentalis* (Fluted pumpkin, Apiroko), *Solanum macrocarpon* (Garden egg, Igbagba), *Solanum nigrum* (Glossy nightshade, Odu, *Solanum scabrum* (Huckleberry, Ogummo)), *Trichosanthes cucumerina* (Snake tomato, Tomati elejo), *omygdalina* (Bitter leaf, Ewuro), *Curcubita pepo* (Field pumpkin, Elegede), *Crassocephalum crepidoides* (Fireweed, Ebolo) at low level. Also, 84.4percent of the farmers generated more money from vegetables than other sources of income. The factors affecting the cultivation of some selected underutilized vegetables include poor market (81.28%), inadequate extension services (77.66%), unavailable seed (71.34%), and inadequate finance (76.21%). The constraints to the cultivating UIVs include theft, inadequate fertilizer/manure and poor irrigation. There was no taboo against planting and consumption of UIVs. There was a positive and significant relationship between farm size ($r = 0.165$), farm land acquisition ($r = 0.258$), level of education ($r = 0.207$) and the cultivation of the underutilized-indigenous vegetables (UIVs) at $P \leq 0.05$. The study recommends the concentration of extension services towards enhancing the cultivation of underutilized indigenous vegetables

Keywords: Economic values, Extension Agents, Extinction, Under-utilized Indigenous vegetables.

Introduction

Vegetables have important features in Nigerian diets, a traditional meal without it is assumed to be incomplete. Indigenous vegetables provide food, income and employment opportunities for many farmers, and are of medicinal advantages. For instance, pumpkin is well known for boosting blood in anaemia patients. They are known for the high iron and vitamins content. Despite all the economic and nutritional benefits of these vegetables, most of them are being gathered from the wild from time immemorial, and those being cultivated are on a very small scale by few peasant farmers. Over the years, the diversity of these indigenous vegetables is being seriously eroded as a result of the multiplicity of environmental and socio-cultural factors. Evidence of this is the fact that most of these vegetables are very scarce to come by nowadays. These vegetables have been so underutilized that their nutritional and Economic strength are also being forgotten.

The term underutilization refers to the categories of wild and cultivated plants which in general, involve

species whose potentials have not been fully realized and utilized. It may also mean plants currently abandoned by farmers but which could be revived through specific interventions such as adding value to their marketing (Padulosi and Hoeschle-zeledon, 2004).

Indigenous Vegetables are “those crops, which are part of a larger biodiversity portfolio, once popular but are now neglected by users’ group for some agronomic, genetic, economic, social and cultural factors”. Other terms/ synonyms of underutilized species according to Padulosi and Hoeschle-Zeledon, (2004) are Orphan, abandoned, niche, and promising, underdeveloped species

Some of the species have an enormous wealth of agro biodiversity and great potential for contributing to improved incomes, food security and nutrition, and combating the 'hidden hunger' caused by micronutrient (vitamin and mineral) deficiencies. They have medicinal properties, and are recognized to have traditional uses in localized areas. Some

UIVs like Worowo- (*Solanecio bialfrae*) and Ishapa- (*Hibiscus sabdariffa*), were in the past used during festivals like Christmas. They are strongly linked to the cultural heritage of their nativity. However, some of them have weak or no formal seed supply systems. They are collected from the wild and are produced traditionally with little or no external inputs. The underutilized vegetables receive little attention from research, extension services, policy and decision makers, donors, and technology providers. (Adebooye and Opabode, 2004).

The Food and Agricultural Organization (FAO, 1998) reported that countries of West and Central Africa sub-regions have identified a large number of underutilized species that are important to the livelihoods of the local population. According to Adebooye *et al.* (2003), some of the notable crops among the UIVs include seven cereals, eight legumes, four roots and tubers, eight oil crops, 31 fruits and nuts, 17 vegetables and spices, four beverages, 38 medicinal plants and 44 genera of forages. (Adebooye *et al.* (2003) reported an expanded list of twenty-four indigenous leaf vegetables that are eaten in southwest Nigeria only. Several other species have been listed by Okafor (1983, 1998,) in Nigeria, Abbiw (1990) in Ghana and Chweya (1997) in Kenya for the entire tropical Africa.

The cultivation of vegetables is no more popular due to the non-availability of inputs, illiteracy, expensive and complex technologies (Mofeke *et al.*, 2003). The under-cultivation of the crops led to majority of them going into extinction. There is the need to consider these indigenous vegetables because they have the potential of improving the revenue base of the farmers and also generate employment for the teaming population. In the light of this, the study set at providing answers to the following questions.

Despite the Nutritional, medicinal, cultural and diverse resource value of the UIVs and their immense contributions to food security and economic growth in Nigeria, it is observed that many of them have been under-cultivated over the past decades and this have led to majority of these vegetables going into extinction. Therefore, high concentration is needed on these underutilized-indigenous vegetables which if adequately considered, promises to, generate revenue, provide employment, and provide adequate nutritional values for consumers, as these vegetables have done in time past, during their hay days of cultivation.

- i. What are the personal characteristics of the farmers cultivating these underutilized-indigenous vegetables?
- ii. What are the economic importance of these underutilized-indigenous vegetables?
- iii. What is the current level of cultivation of these underutilized-indigenous vegetables in the State of Osun?
- iv. What are the socio-factors impeding the cultivation of these underutilized-indigenous vegetables?

Objectives of the study

The main objective of this study is to assess the socio-cultural factors influencing the cultivation of underutilized indigenous vegetables in Osun State, Nigeria.

The specific objectives are to:

- i. Describe the personal and socio-economic characteristics of farmers
- ii. examine the economic importance /significance of these underutilized-indigenous vegetables;
- iii. determine the level of cultivation of these underutilized-indigenous vegetables; and
- iv. identify the socio-cultural factors affecting the cultivation of these underutilized-indigenous vegetables.

Hypothesis of the study

1. There is no significant relationship between the socio-economic characteristics of farmers and the cultivation of underutilized-indigenous vegetables.

Methodology

The study was conducted in the three Agricultural Development Programme (ADP) zones of Osun state. A multistage sampling procedure was used to select 180 respondents. In the first stage, two Local Government Areas (LGAs) were purposively selected from each of the three ADP zones, based on their involvement in cultivation of the UIVs. In the second stage, three communities were purposively selected from each LGA. Finally, ten (10) UIV farmers were randomly selected from each community, given a total of 180 respondents. A validated and pre-tested structured interview schedule was used to elicit information from the farmers. The interview schedule was designed in English language and interpreted into Yoruba language on the field for illiterate farmers (respondents). To determine level of cultivation, the number of acreage cultivated by each farmer was used. Using national farm size classification, the farmers were categorized into small (1-2 hectares | 2.5-5.0 acres), semi-medium (2-4

hectares 1 5.0-10.0 acres), medium (4-10 hectares 1 10.0-20.0 acres) and large (>10 hectare 1 25 acres) size groups on the basis of their operational land holdings (Navjot and Poonam (2014). This was subjected to analysis using mean and standard deviation. Mean plus standard deviation gave the High level of cultivation, mean minus standard deviation equaled low level of cultivation. The difference between high and low gave the medium level of cultivation. Data collected were analyzed using both descriptive statistics such as frequency counts and percentages, means, standard deviation, and inferential statistic such as Pearson correlation.

Results and discussion

Socio-economic characteristics of respondents

Data in Table 1 shows socio-economic characteristics distribution of the respondents. The majority (80%) of the respondents were female while the remaining 20percent were male. This might be as a result of male involvement in planting of permanent crop such as cocoa, kolanut etc. that brings much money and the fact that vegetable planting is been perceived as female's work. The majority (67.8%) of the respondents were between 30 and 60 years old while 23.3percent were 61 years and above. Only very few (8.9%) respondents were less than 25 years old. The majority of the farmers were at their middle age though still strong to bear the tediousness task of farming but may soon be getting old and retiring from UIV farming. Furthermore, majority (67.8%) of the farmers were married. The result was expected since majority of the farmers were in their middle aged. Almost half (47.2%) of the respondents had no formal education, 31.7percent had primary education, 19.4percent had secondary education, while only 1.7% had post-secondary education.

This implies that almost half were illiterate. In view of this, therefore, it is expected that the respondents in the study area might not be able to understand and adopt improved management practices involved in planting UIVs. This is in line with the findings of Tijani *et al* (2001) and Ogunjimi (2002) that majority of arable crop farmers and cacao farmers respectively had no formal education. Also, most (57.8%) of the farmers practiced Islamic religion while others were Christians, Over eighty percent (80.6%) had a moderate household sizes. It may be as a result of the adoption of western culture which encouraged small family size

Majority (68.3%) of the respondents got their farmland through leased holding. Few (25%) of them inherited theirs, very few (5%) of them purchased their farmland, while 1.7 percent got theirs as gift. This implies that most of the UIV

farmers were not the owners of their farmlands, Most (93.4%) of the respondents had below an acre of farmland, very few (5%) had an acre, while only 1.1 percent of the respondents had above an acre of farmland. It shows that UIV farmers cultivate a small area of land and were rarely visited by extension agents and.

Table 1: Distribution of respondents according to their socio-economic characteristics (N= 180)

Characteristics	Frequency	Percentage (%)
Sex		
Male	36	20
Female	144	80
Age		
Less than 25	16	8.9
26-45	49	27.2
46-55	73	40.6
above 55	42	23.3
Marital status		
Single	15	8.3
Married	122	67.8
Widowed	30	16.7
Separated	13	7.3
Level of education		
No formal education	85	47.2
Primary	57	31.7
Secondary	35	19.4
Postsecondary	03	1.7
Religion		
Christianity	76	42.2
Islam	104	57.8
Household size		
0	1	0.6
1-5	147	81.6
6-9	32	17.8
Land acquisition		
Inheritance	45	25.0
Purchase	9	5.0
Gift	3	1.7
Leased	123	68.3
Farm size		
Below an acre	169	93.9
An acre	9	5.0
Above an acre	2	1.1
Extension contact		
No contact	89	49.4
1-5	60	33.3
6 and above	31	17.3

Source: Field Survey, 2013

Economic importance of Underutilized Indigenous Vegetables

Results in Table 2 show the farmers' mean earning from vegetable and non-vegetables per day. The mean earning per week from vegetable was ₦22,144 In contrast, the mean earning of the farmers per week from other crops was ₦13,663. The mean income per week from livestock was ₦12, 013 and the mean income per week from non -farming work was ₦ 8,885.40. The results implied that mean income derived from the UIVs was higher than other sources (other crops, Livestock and non-farming activities).

Table 2: Distribution of farmers based on their vegetable and non-vegetable earnings (₦)

Earnings	Mini mum	Maxi mum	Mea n	Std. deviat ion
Vegetable earning per week	3500.00	8000.00	2214.40	16167.89433
Non vegetable earning				
Other crops earning per week	2000.00	5000.00	1366.30	9665.94752
Livestock earning per week	2500.00	3000.00	1201.30	6013.67650
Non farming earning per week	2000.00	3000.00	8885.40	5893.49492

Source: Field Survey, 2013

3.3. Level of Cultivation of Underutilized Indigenous Vegetables

Table 3 shows the distribution of the respondents according to their level of UIVs' cultivation.

The majority of the respondents were at low level of cultivation of *Solanum nigrum* ((Glossy nightshade, Odu, (82.1%) *Solanum scabrum* (Huckleberry, Ogummo)(84.4%), *Trichosanthes cucumerina* (Snake tomato, Tomati elejo)(86.7%), *Curcubita pepo* (Field pumpkin, Elegede}(92.6%), *Crassocephalum crepidoides* (Fireweed, Ebolo) (89.4%). Others include *Telfairia occidentalis* (Fluted pumpkin, Apiroko) (83.3%), *Solanum macrocarpon* (Garden egg, Igbagba) (78.3%), *Solanecio bialfrae*(Worowo)(96.4%) and *Vernonia amygdalina* (Bitter leaf, Ewuro) (85.0%) also at low level of cultivation. This implies that, the level of cultivation of UIVs in Osun State was at low

Table 3: distribution of the respondents according to their level of cultivation (N = 120)

UIVs	Low level %	Medium level %	High level %
<i>Solanum nigrum</i> ((Glossy nightshade, Odu,	82.1	15.6	2.3
<i>Solanum scabrum</i> (Huckleberry, Ogummo))	84.4	13.7	1.9
<i>Trichosanthes cucumerina</i> (Snake tomato, Tomati elejo)	86.7	13.3	0.0
<i>Curcubita pepo</i> (Field pumpkin, Elegede}	92.6	7.3	0.0
<i>Crassocephalum</i>	89.4	9.8	0.8

crepidoides (Fireweed, Ebolo)			
<i>Telfairia occidentalis</i> (Fluted pumpkin, Apiroko)	83.3	15.0	1.7
<i>Solanum macrocarpon</i> (Garden egg, Igbagba)	78.3	20.9	0.8
<i>Amaranthus virides</i>	87.5	10.8	0.2
<i>Teteabalaye</i>			
<i>Omygdalina</i> (Bitter leaf, Ewuro)	85.0	13.3	1.7
<i>Solanecio bialfrae</i> (Worowo)	96.4	3.6	0.0

Source: Field survey, 2013

Note: 8 plots = 1 acre, a standard plot is 120 by 60 feet or 100 by 50 feet plot

Mean = 5.9

Standard deviation = 2.3

Level of cultivation =

$5.9 + 2.3 = 8.2 = \text{High}$

$5.9 - 2.3 = 3.6 = \text{Low}$

$8.2 - 3.6 = 4.6 = \text{Medium}$

Constraints to the cultivation of UIVs

Results in Table 4 show the constraints to the cultivation of underutilized indigenous vegetables in Osun State. Inadequate finance (98.9%), pests and disease (96.1%), unavailability of land (86.1%) and high production cost (82.8%) are the major constraints to the cultivating *Telfairia occidentalis* (Apiroko). Poor access to extension services (100%), high production cost (98.9%), and unavailability of seed (98.9%), are the major problems affecting the cultivation of *Solanum nigrum* Odu.

Furthermore, poor access to extension service (100%), high production cost (87.8%) and poor market (80.6%) are the constraints of cultivating *Solanum macrocarpon* (Igbagba). Whereas, Seed unavailability (99.4%) is the main constraints affecting the cultivation of *Solanum scabrum* (Ogunmo).

Moreover, poor market (86.7%) and pests and diseases (87.2%) were the constraints to the cultivation of *Trichosanthes cucumerina* (Tomati elejo).

Also, poor access to extension services (100%), pests and diseases (84.4%) and high production cost (84.4%) were the major constraints affecting

cultivation of *Curcubita pepo* (Elegede). While unavailability of seed (100%) and poor access to extension training and services (89.4%) were the constraints hindering the cultivation of *Solanecio bialfræe*(Worowo)

In a nut shell, the cultivation of UIVs are faced with an avalanche of constraints such as unavailable seed, poor irrigation, poor extension training and services, pest and diseases, poor access to farm land, high cost of production and inadequate finance.

These problems must be solved to allow cultivation and prevent the extinction of the Under-utilized indigenous vegetables.

Test of hypothesis

There is no significant relationship between selected socio-economic characteristics of farmers and the cultivation of underutilized-indigenous vegetables.

The results in Table 5 showed that there are positive and significant relationship between farm size ($r = 0.165$), farm land acquisition ($r = 0.258$), level of education ($r = 0.207$) and the cultivation of the underutilized-indigenous vegetables (UIVs) at $P \leq 0.05$.

This showed that the higher the magnitude of these variable, the higher the cultivation of the UIVs. Whereas, there are negative and significant relationship between age ($r = -0.081$) and the cultivation of the underutilized-indigenous vegetables at $P \leq 0.05$. This revealed that the older the respondents the lower the cultivation of the UIVs.

Conclusion and recommendations

Most of the farmers had low level of education, had below an acre farm size, were at their middle ages. They were at low level of cultivation of UIVs. Age, marital status, farm land acquisition and farm size are significantly correlated to the cultivation of UIVs. Cultivation of UIVs are faced with avalanche of constraints such as unavailable seeds, poor irrigation, poor extension training and services, pest and diseases, poor access to farm land, high cost of production and inadequate finance.

Extension programmes geared toward the publicity of the nutritional and economic importance of underutilized indigenous vegetables should be embarked upon by governments and Agricultural Institutions for farmers and consumers.

This may increase interest of consumers in consuming UIVs, which will increase demand and in turn increase level of cultivation. Adequate social amenities and infrastructure such as, good road network, storage facilities, electricity, good water supply, should be made available to farmers. Governments and financial Institutions should work more on providing financial aids to vegetable farmers.

Similarly, more farmlands should be made opened for vegetable farming at a reduced cost.

Table 4. Distribution of UIVs farmers according to the constraints affecting their cultivation.

Constraints	<i>Telfairia occidentalis</i> (Apiroko)	<i>Solanum nigrum</i> Odu	<i>Solanum macrocarpon</i> (Igbagba)	<i>Solanum scabrum</i> (Ogunmo)	<i>Trichosanthes cucumerina</i> (Tomati elejo)	<i>Vernonia amygdalina</i> (Bitter leaf, Ewuro)	<i>Curcubita pepo</i> (Elegede)	<i>Solanecio biafrae</i> (Worowo)	<i>Crassocephalum crepidoides</i> (Fireweed, Ebolo)	<i>Amaranthus virides</i> (Teteatetedaye)
iSeed	10%	98.9%	70.6%	99.4%	82.8%	72.8%	80%	100%	82.8%	16.1%
Land	86.1%	87.2%	58.3%	71.1%	85.4%	58.9%	77.2%	48.3%	75%	61.1%
Pest & Disease	96.1%	89.4%	65.3%	39.4%	87.2%	58.3%	84.4%	54.4%	34.4%	100%
Perishability	56.7%	82.2%	53.9%	41.1%	61.1%	51.1%	72.2%	59.4%	48.3%	88.3%
Poor Market	79.4%	78.9%	80.6%	60.0%	86.7%	51.1%	73.3%	85.6%	95.6%	84.4%
Irrigation	30.6%	30.6%	28.9%	25.0%	17.8%	88.3%	37.8%	20.0%	13.3%	15.6%
Production Cost	82.8%	83.3%	64.4%	60.0%	28.9%	11.2%	73.9%	65.0%	62.2%	58.3%
Finance	98.9%	98.9%	87.8%	63.3%	61.7%	27.8%	84.4%	79.4%	79.4%	70.0%
Extension	70.2%	100%	100%	78.9%	83.3%	38.3%	100%	89.4%	92.8%	91.7%
Taboo	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Others	37.2%	37.2	28.3%	43.9%	29.4%	31.7%	45.6%	32.2%	43.3%	17.8%

Source: Field Survey, 2013 Table 5:

Table 5: Summary of Correlation Coefficient between socio-economic characteristics of farmers and level of cultivation

Variables	Coefficient (r)	r ²
Age	-0.081	0.00660
Level of education	0.207	0.043
Farm land acquisition	0.258	0.067
Farm size	0.165	0.028

Source: Field Survey, 2013.

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Appendix



Figure 1: *Telfairia occidentalis* (English name: Amaranth, Yoruba name: Tete atetedaye)



Figure 2: *Amaranthus viridis* (English name: Fluted pumpkin, Yoruba name: Apiroko/ugu)



Figure 3: *Crassocephalum crepidioides* (English name: fireweed, Yoruba name: Ebolo)



Figure 4: *Veronia omygdalina* (English name: bitter leaf, Yoruba name: Ewuro)



Figure 5: *Solanecio biafrae* (Yoruba name: woorowo)



Figure 6: *Trichosanthes cucumerina* (English name: Snake tomato, Yoruba name: Tomato elejo)



Figure 7: *Solanum macrocarpon* (English name: eggplant, Yoruba name: Igbagba)



Figure 8: *Solanum nigrum* (English name: African nightshade, Yoruba name: Odu)



Figure 9: *Solanum scabrum* (English name: arlet eggplant, Yoruba name: Ogunmo)



Figure 10: *Curcubita pepo* (English name: Field pumpkin, Yoruba name: Elegede)