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FACTORS INFLUENCING YOUTHS' UTILIZATION OF UNDERUTILIZED INDIGENOUS VEGETABLE INNOVATIONS AS A LIVELIHOOD STRATEGY IN SOUTHWESTERN NIGERIA

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ABSTRACT

Underutilized indigenous vegetables (UIVs) play a highly significant role in food security, employment creation and income generation for the youth in both urban and rural settings in fighting against poverty and hunger. However, certain factors are responsible for youths' utilization of these innovations in producing these vegetables. The study therefore, focused on factors influencing youths' utilization of UIV innovation as a sustainable livelihood strategy in Southwestern Nigeria. A multistage stage sampling procedure was used to select the respondents. Data were gathered through structured interview schedule from 155 youths between the age of eighteen to forty years. Data were analyzed using appropriate descriptive statistical tools while factor analysis was used to isolate crucial factors influencing youths' utilization of UIV innovations. The result showed that the respondents had a mean age of 28.3 years while above half (52.9% and 58.1%) were male and single, respectively. The mean annual income from vegetable production was $ 305.81 with the mean farm size of 0.8 ha. Further results indicated that site selection, marketing and storage were the major UIV innovations utilized by the respondents. Majority (68.4%) utilized UIV innovations at moderate level. Educational, experience, economic benefit, institutional support and community factors were the crucial factors influencing youth utilization of UIVs innovations. Relevant stakeholders should promote utilization of UIV innovations among young farmers as a sustainable livelihood strategy.

Key Words: Factor, innovations, underutilized indigenous vegetable, utilization, youth

INTRODUCTION

Youth generation represents a major catalyst for change and a backbone of a nation which can be mobilized for national development through participation in agriculture (Valerie, 2009). The youths have also been identified as constituting the major resource-base for any country which wants to embark on any meaningful agricultural and rural development projects (Onuekwusi, 2005). Ugwokwe *et al.* (2005) noted that youths have been a part of the overall agricultural development process in Nigeria because of their immense contribution of agriculture to the economy. In many countries youth integration in agricultural activities is important for the development of the agricultural sector. This is because youths have potential to overcome some major constraints in agriculture development as they are more open to new ideas and practices than adult farmers (Daudu, 2009).

According to FAOSTAT (2007), vegetables can be defined as any plants that contain 70-95 percent of water, generally low in dry matter and nutrients, often contain minerals and vitamins that are partly lost in cooking and often a large part of the commodity is discarded during preparation. Vegetables are predominantly classified into as either exotic or indigenous vegetables (Laker, 2006). Indigenous vegetables are abundant, easily accessible, locally adaptable, cost effective and acceptable in custom and traditions of tribal and set-

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tler communities (FAO, 1988). In Africa, indigenous vegetables hold excellent potential to improve nutrition and increase dietary diversity, where malnutrition remains a major problem. Many of these vegetables are richer in protective elements than exotic counterparts and also have anti-bacterial, anti-viral, anti-inflammatory, antithrombotic, vaso-dilatory actions and antioxidant activities (WHO, 2003). They are rich and comparatively cheaper sources of vitamins and minerals. Their consumption in sufficient quantities provides taste, palatability and increases appetite and provides fair amount of fibres (Kundu *et al*., 2010).

Indigenous vegetables are good source of income to youths who produce them. It is possible to earn much money annually on vegetable farming with little initial capital and small piece of land as against most arable crops (Eleke, 2004). Despite the fact that they occupy a small share of the arable land area, quick growing and yield immediate return to the growers, vegetable production, particularly in Nigeria, has the potential to be highly profitable, increase employment opportunities, generate income and bring about an increasing commercialization of the rural sector (Weinberger and Lumpkin, 2007). To this end, re-igniting interest in the production and taste for - indigenous and traditional foods like indigenous vegetable can help not only to improve nutrition but also to increase incomes, to restore biodiversity, and to preserve local cultures (Stone *et al*., 2011).

Involvement of youth in productive activities like cultivation of underutilised vegetables which will enhance sustainable livelihood, has been of great concern to government and non-governmental organizations in Nigeria for many years, because most of the farmers that engaged in vegetables production are from older illiterate generations. Valerie (2009) further argued that young farmers are needed to replace the ageing farmers. It has also been reiterated that, the productivity level of the aged farmers cannot meet the demand of ever increasing population (Cook, 1996). Government at different levels and donor agencies, have initiated intervention projects to engage youths in productive ventures. One of such intervention projects was Nigeria-Canada underutilised indigenous vegetable (Ni-Can Veg) project (106511) which is an IDRC/CIDA sponsored project through the Canadian International Food Security Research Fund (CIFSRF). This project attempted to stimulate youth interest in the production of underutilised indigenous vegetables (UIVs) in Southwestern Nigeria as a means of sustainable livelihood strategy. Since 2013, Ni-Can Veg project has been playing a great role in creating awareness, enhancing capacity building and empowerment of vegetable farmers to develop best management practices of locally available underutilised indigenous vegetables for income generation and better nutrition. This was intended to inculcate the positive attitude to youth toward vegetable production as a sustainable livelihood strategy.

Previous studies conducted by (Obwona, 2000) and Ajibefun, 2006) indicated that the low rate of utilization of agricultural innovations/ technologies among farmers could be due to low expected benefits from the practice or other factors such as farmers' characteristics or technology factors which may not encourage the utilization of technologies by farmers. However, many youths in the study area have been trained on best agronomic practices (innovations) in the production of underutilised vegetables while some of them have been utilising these UIVs innovations. But, the question is, what are the factors influencing Utilization of UIV innovations by the youths? The specific objectives of this study were to,

(1) describe socio-economic characteristics of youth respondents who utilized of UIVs innovation in the study area;
(2) determine the level of utilization of UIVs innovations by the respondents; and
(3) identify factors that influence youth's utilization of UIV innovations in the study area.

METHODOLOGY

The study was conducted in Southwestern Nigeria. The population for the study consists of youth people between 18 and 40 years of age who participated in Ni-Can Veg projects under the auspices of Obafemi Awolowo University, Ile-Ife and Osun State University, Osogbo, Nigeria. The project covered Osun, Ekiti, and Oyo States. A multi-stage sampling procedure was used to select respondents for the study. At the first stage, Osun and Ekiti States were purposively selected based on the fact that they had the largest number of youth that participated in the project. At the second stage, nine production sites were proportionately selected in Osun State and Ekiti State based on active participation of youths in the production sites. In Osun State, *Ilode, Omiokun, Okuku, Inisha 1, Inisha 2, Osogbo 1,* and *Osogbo 2* project sites were selected while *Ikole* and *Iludun* project sites were selected from Ekiti State. At the third stage, a total of 155 respondents were proportionately selected from the two States. Validated and pre-tested interview schedule was used to elicit information on personal and socio-economic characteristics of the respondents and UIVs production activities they participated in. The data were summarized using descriptive statistics like frequency counts, percentages, mean and standard deviation. Factor analysis was used to isolate crucial factors influencing youth's utilization of UIVs. The variables were grouped using principal component analysis with varimax rotation. The cut-off point for constant loading was 0.30 and the constant loading less than 0.30 was discarded (Ashley, 2006; Madukwe, 2004). Also, Kaiser's criterion was used to determine which factor to retain in the result of the analysis, thus factors with Eigen value greater than one were retained. The factors were thereafter named based on the following criteria as employed by Alabi *et al*. (2013) and Famakinwa *et al*. (2017).

(i) Picking synonyms of the highest loaded variables on each factor.
(ii) Joint explanation or interpretation of the meaning of the positive and highly loaded variable on each factor and/or retaining the name based on the similarity of the features reposed in the variables contributing to the factors.
(iii) The researcher's subjective interpretation of experiences from literatures.

Measurement of Variables

The dependent variable was conceptualized as youths' utilization of UIV innovations. The dependent variable was measured by calculating total utilization score of each respondent from indicators arising from various innovations on underutilized indigenous vegetable (production, processing and marketing). The reaction was against a 4-point scale of utilization ranging from never utilize (1 point), rarely utilize (2 points), occasionally utilize (3 points) and regularly utilize (4 points) as employed by Adeyemo *et al*. (2017). The maximum score for each respondent was 64 points while minimum score was 16 points. The total score per respondent was further classified into three categories as follows: low, moderate and high level of utilization using mean of total utilization score plus/minus standard deviation.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Results in Table 1 show that the mean age of the respondents was 28.3 with standard deviation of 5.5 years. This is in line with finding of Agboola *et al.* (2015) that the mean of age of youth vegetable farmers in Oyo State was 28.6 ± 3.8 years. Most of these young people are creative, energetic and innovative and always ready for productive activities, therefore, these qualities should be harnessed by motivating and encourage them to adopt and utilize UIV innovations in production, processing and marketing. About 52.9% of the respondents were male while 47.1 percent were female. This implies gender is not a barrier in utilizing UIVs innovations as both male and female youths were involved. Results

show that almost two-third (64.5%) of the respondents had secondary education with the mean years of formal education of 9.6 ± 2.4 years. These imply that that youth who are involved in the cultivation of underutilized indigenous vegetables under Ni-Can Veg pro-

Table 1: Distribution of respondents by selected personal and socio-economic characteristics (n=155)

Socio-economic characteristics	Frequency	Percentage	Mean ± Standard deviation
Age			
< 20yrs	10	6.5	
20- 30yrs	92	59.3	28.3 ± 3.8
> 30yrs	53	34.2	
Sex			
Male	82	52.9	
Female	73	47.1	
Farm size (ha)			
< 0.5	87	56.1	
0.6-1.5--	41	27.8	0.84 ± 0.06
> 1.5	27	17.4	
Years of formal education			
< 7 years	25	16.1	9.6 ± 2.4
7-12 years	100	64.5	
> 13 years	26	18.7	
Years of residence			
< 10 years	21	13.5	
10-19years	120	77.4	12.7 ± 5.2
> 20 years	14	9.1	
Social participation in organization			
Youth organization	22	14.2	
CBO	7	4.5	
Student organization	30	19.4	
Cooperative society	92	59.4	
Social Clubs	2	1.3	
Community development association	2	1.3	
Years of experience in farming			
< 5 years	39	25.2	
6-10years	83	53.5	6.8 ± 4.4
> 10 years	33	21.3	
Mode of land acquisition			
Inheritance	85	55	
Purchase	47	30	
Gift	8	5	
Lease	15	10	
Income (1USD= N 360)			
< N 18,000	40	25.8	
N 18,000 - N 37,999	45	29	N 37,073
N 38,000- N 57,999	36	23.2	
> N 58,000	34	21.9	

ject were literates; hence, they might be ready to utilize the innovation. About 62.6 percent of the respondents had farming as their primary occupation. This suggests that due to short gestation period of vegetable production and its ability to generate income quickly might be the factors that attract youth into vegetable production as against other farming activities. The findings further reveal that above half (56.1%) of the respondents had farm size of less than 0.5 ha for cultivation of UIVs. This finding implies that majority of the youths make use of small farm size for vegetable production and this conforms to the finding of Agboola *et al.* (2015) that asserted that the mean farm size of vegetable farmers is less than 0.8 ha. The average income realized from cultivation of UIVs was $ 305.81per annum. This result means that majority of the youth farmers' income from UIV production was below the minimum wage of $ 50 per month for the least paid Nigerian worker which may be due to low consumption UIVs in the study area; indicating the need for scaling up the income potentials of UIV production to make them more attractive to the unemployed rural youths, thereby minimize rural-urban migration. Hence, there is still need to stimulate their interest in production of UIVs. This is gives credence to the report of Agboola *et al.* (2015), who noted that young farmers earn less income from vegetable production. Many (59.4%) of the respondents belonged to cooperative society. This corroborates the findings of Alabi (2010) and Aladekomo (2011) who described cooperative society as an association which majority of farmers belong to. Above half (53.5%) had 6-10 years of experience in vegetable production business with the mean farming experi-

Table 2: Distribution of respondents by utilization of UIV innovations (n=155)

UIV innovations	Never utilised Feq	Seldomly utilised Freq	Occassinally utilised Freq	Regularly utilised Freq	Mean	Rank order
Improved land clearing	2	31	31	87	3.26	11th
Tree felling	13	31	31	57	2.90	16th
Stumping	13	15	36	86	3.19	13th
Processing	1	15	49	85	3.34	5th
Selection of suitable site	1	7	43	99	3.48	1st
Preparation of nursery bed	21	0	67	62	3.02	15th
Application of pesticides	17	0	28	106	3.38	4th
Use of pumping machine for irrigation	1	21	34	93	3.33	7th
Supplying& thinning	3	15	68	63	3.15	14th
Use of improved seed varieties	3	27	31	87	3.28	9th
Use of herbicides for weed control	3	16	46	87	3.32	8th
Application of organic manures/ fertilizers	2	18	39	90	3.28	9th
Timely harvesting	11	0	45	93	3.34	5th
Planting of seed	1	18	59	71	3.21	12th
Storage	2	13	35	100	3.43	2nd
Marketing	1	17	52	80	3.40	3rd

Grand mean score = 3.27

ence of 6.8 years. With this experience in vegetable production, it is expected that the respondents would be able to make sound decisions as regards resource allocation and management of their farms. Above half (55%) of the respondents acquired land used for vegetable production through inheritance while about one-third got access to land through outright purchase. This corroborates the findings of Famakinwa *et al.* (2017) which established that majority of the famers acquired land for farming through inheritance, rent and outright purchase. (I $ US=N 360)

Utilization of UIV Innovations

Results in Table 2 reveal that out of the sixteen UIV innovations, selection of suitable site (mean = 3.48) ranked the highest among the UIV production innovations which respondents utilized, followed by storage of underutilized vegetables (mean = 3.43), marketing of UIVs (mean= 3.40), application of pesticides to control vegetables pests (mean= 3.38), harvesting of vegetables at the right time (mean=3.34), processing of UIVs (mean=3.34), use of pumping machine for irrigation (mean=3.34), use of herbicides for weed control (mean =3.28), use of improved seed varieties (mean =3.28) and in that order. Comparing the grand mean score of 3.27 with individual mean score, it shows that respondent mostly utilized site selection, storage of produce, marketing, application of pesticides, processing, use of pumping machine for irrigation, use of herbicides for weed control and use of improved seed varieties. This could be because these innovations are easy to practice and have relative advantage over old methods they have been using before.

Level of Utilization

Results in Table 3 show that majority (68.4%) of the respondents were at a moderate level of utilization while few (12.2% and 15.9 %) of the respondents had high and low level of utilization respectively. This implies that most of the respondents in the study area were moderately utilized underutilized indigenous vegetables innovations in the study area. This could be as a result of low income realized from the production of UIVs and unfavourable community attitude towards production and consumption of UIVs.

Factors influencing of Utilization of UIV Innovations

Results in Table 4 show the results of varimax factor rotation pattern with the measures that were highly loaded on each of the five factors extracted that influenced youth utilization of UIV innovations. The cut-off point for constant loading was 0.30 and the constant loading less than 0.30 was discarded (Anselm *et al*, 2010; Ashley *et al*, 2006; Madukwe, 2004). Out of all the variables listed, the loading that gives Eigen value of greater than one were five in number. Also, Kaiser's criterion was used to determine which factor to retain. Thus factors with Eigen value greater than one were retained. The contribution of each of the highly loaded variables to youth Utilization of underutilised vegetables innovations were shown in Table 5. The results in Table 5 reveal that five factors cumulatively explained about 70.09 % of the total variance which implies that these variables are strong enough to determine youth utilization of UIV innovations while 29.19 % of the variance account for unknown factors.

Table 3: Distribution of respondent according to level of utilization of UIV innovation (n=155)

Utilization score	Level of utilization	Frequency	Percentage
Less than 23.6	Low	25	15.9
Between 23.6 and 34.2	Medium	106	68.4
Above 34.2	High	19	12.2

Mean = 28.9, Standard deviation = 5.3

Educational factors: Results in Table 4 show that level of education (L=0.963), marital status (L=0.598) and household size (L=0.627) were variables that contributed to educational factor. The finding implies that level of youth utilization of UIV innovations depend largely on their educational attainment. Since education is an asset for adoption decisions which will eventually lead to full utilization of UIV innovations. This is result corroborates the finding of Nnadi and Akwiwu, (2008) who established that education determine youth participation in agriculture in Imo State.

Table 4: Factor analysis showing variables that influence youth utilization of UIV innovation (n=155)

Variables	L	L^2	Λ
Educational factor			
Marital status	0.598	0.36	
Level of education	0.963	0.93	1.68
Household size	0.627	0.39	
Personal experience factor			
Age	0.510	0.26	
Years of education	0.629	0.40	1.61
Experience in vegetable production	0.788	0.62	
Farm size	0.574	0.33	
Institutional support factor			
Distance of Ni-CanVeg site	0.354	0.13	
Provision of loan	0.646	0.42	
Provision of irrigation facilities	0.847	0.72	1.57
Provision of inputs by projects	0.548	0.30	
Economic benefit			
Availability of credit sources	0.476	0.23	
Income from UIVs	0.770	0.59	
Membership of cooperatives	0.340	0.12	
Length of stay in the community	0.466	0.22	1.63
Community factor			
Community attitude to UIVs	0.704	0.50	
Availability of infrastructures	0.646	0.42	0.92

*Significant. Contributing at $p \leq 0.01$,
L=Loading for factor, L^2= Square of loading,
λ = Latent root for factor ($\Sigma L\lambda$)

***Experience factor*:** This was named from age (L=0.510), years of education (L=0.629), years of experience in vegetable production (L=0.788) and farm size (L=0.574). The finding implies that youths' Utilization of UIV innovations depends largely on level of experience of youth in vegetable production before introduction of UIV innovations. Hence, experience is gained with age. Physical maturity coupled with their experience in vegetable production could enhance youths' utilization of UIV innovations. Youth who have good years of experience in vegetable production and mature enough would likely embrace utilization of UIV innovations. This is because it is expected that youth who good experience would be able to make sound decisions as regards resource allocation and management.

***Institutional support factor*:** Result from Table 4 show that variables that contributed to institutional support factor as provision of project demonstration site (L=0.354), provision of loan by the projects (L= 0.646), provision of irrigation facilities like pumping machines at subsidized price (L=0.847) and provision of other inputs by the projects (L=0.548). This implies roles played by Ni-Can Veg projects such provision of demonstration site for youth training in production of UIVs, provision of loan by the projects, provision of necessary inputs like seeds and irrigation facilities like pumping machines for the youth at subsidized price would enhance youth in utilizing these innovations.

Economic benefit factor: was named from four variables namely availability of sources of credit (L=0.476), income realized from vegetable production (L=0.744), membership of cooperative societies (L=0.340) and long stay in the community (L=0.466). Amount of income realized from cultivation of UIVs

could determine youths' utilization UIV innovations because amount of income benefits realized from cultivation of UIVs could determine whether the youth would utilize the innovations or not after they have been trained. This is similar to the finding of Obwona (2000) and Ajibefun, (2006) who established that expected benefits such as better income could influence rate of utilization of technology.

Community factor: was named after attitude of community members to UIVs production and consumption (L= 0.704) and availability of infrastructures in the community (L=646). Favourable attitude of the community members towards production and consumption of underutilized vegetables coupled with availability of infrastructures in the community could boost youth interest in farming and influence their utilization UIV innovations introduced to them. A community where its members have unfavourable attitude towards UIV production and consumption and lack necessary social amenities, would definitely have negative impact on their youth in participating in agriculture.

CONCLUSION

Based on the findings of the study, it could be concluded that despite the contribution and importance of underutilized indigenous vegetables, majority of the youths are still utilizing UIV innovations at moderate level which accounted for low income being realized from them. It was also established that the factors that influence youth utilization of underutilized vegetables innovations were educational factor, experience factor, economic benefit factor, community factor and institutional support factor. It is recommended that government and other relevant agencies should be involved in promoting utilization of UIV innovations as a means of income generation among young farmers by giving them necessary support such as credit and inputs provision; this would stimulate the youths' interest in production UIVs. Finally, all factors identified should be enhanced by relevant stakeholders in order to encourage youths to key to relevant programmes that would boost agricultural production and improve their livelihood status.

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Table 5: Factor names and percentage variation accounted for by each factor that influence youth utilization of UIVs innovations (n=155)

Factors	Name	Eigen values	Variation %	Cumulative %
1	Educational	7.30	20.30	20.30
2	Experience	5.12	16.51	36.81
3	Institutional support	4.34	12.82	49.63
4	Economic benefit	3.98	10.62	50.25
5	Community	2.81	9.84	70.09

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