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Utilization of Sustainable Vegetable Production Technologies in Oyo State, Nigeria

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Abstract – **The study focused on Utilization of Sustainable Vegetable Production Technologies in Oyo State Nigeria. Specifically, the research work ascertained the socio-economic characteristics of vegetable farmers; determine the accessibility and level of utilization of sustainable vegetable production technologies and problems associated with sustainable vegetable production technologies. A multistage sampling technique was used in selecting 240 vegetable farmers. Structured interview schedule was used to obtain information from the respondents. The data was analyzed using percentages, means and Pearson Product Moment Correlation. It was revealed that majority (92.5%) of the respondents were married. The mean household size was 5 persons. The mean years of vegetable production experience was 17 years. The mean farm size was 1.1 hectare and mean annual income from vegetable production was ₦256, 000.33. Respondents accessed various sustainable vegetable production technologies such as improved vegetable varieties, water management, fertilizer (organic) application and this were utilized at various levels. Sustainability of these technologies were also determined. Strongly significant relationship exist between numbers of accessed sustainable vegetable production technologies and utilization of the technologies (r = 0.748, p = 0.000). The study recommends that Farmers should be given more extension education on the necessity to utilize inorganic fertilizers on their vegetable farms.**

Keywords – **Sustainable, Sustainable Vegetable Technologies, Utilization, Vegetable Production, Vegetable Production Technologies.**

I. Introduction

Vegetables are the edible portion of an herbaceous annual or perennial crop which could either be consumed raw (green/fresh) or after a little cooking. According to many local experts active in Nigeria's agribusiness sector, vegetable production in Nigeria is a sustainable and lucrative business. The domestic consumption of locally grown and native vegetation is high and the growth cycle of vegetation and cultivation is relatively quick at three times the rate of crops such as cassava which can stay in the ground for over a year taking-enough time and land for three planting seasons in the case of many other vegetation. With the most up to date farming methods and the correct investment approach, producing vegetables such as tomatoes, pumpkin, watermelon, cucumber, okro, spinach and so on can guarantee a great harvest both in the field and financially [1].

Vegetable production provides jobs and supports agribusiness, thereby creating economic opportunities. Many vegetable production systems, however, are not sustainable over the long-term. For example, some systems are rapidly degrading the environment due to intense applications of synthetic pesticides and fertilizers, often leading to food contamination and groundwater pollution and contributing to soil erosion. By definition a Sustainable Vegetable Production System (SVPS) should meet the needs of present as well as future generations. Approaches used should not be harmful to the health of farmers nor consumers and should ultimately lead to a reduced impact of agriculture on the environment [2].

Food and Agricultural Organisation [3] estimated that about 790 million people are chronically undernourished in the developing regions of the world. Specifically, daily food consumption consists of mainly cereals, roots and tubers. This poor feeding habit predisposes the people to infections and such disease as typhoid fever, heart, liver and kidney disease due to poor body defense mechanisms. However, adding vegetables to peoples' diet can correct these infections and diseases since the nutritional content of vegetables varies considerably, though generally they contain little protein, fat and varying proportions of vitamins, pro-vitamins, dietary minerals and health-related phytochemicals.

Challenges of vegetable production in Nigeria as identified by [4] includes: Pest and diseases (bacterial, viral, fugal and nutritional diseases), poor Agricultural pricing and low fertilizer use, low access to Agricultural credit, land tenure insecurity, infrastructure problem and Post-harvest losses. Based on the aforementioned problems; specifically, the research work is designed to:

(i) Ascertain the socio-economic characteristics of vegetable farmers.
(ii) Determine the level of utilization of sustainable vegetable production technologies.
(iii) Determine the problems associated with sustainable vegetable production technologies.

II. Methodology

The study was carried out in Oyo state Nigeria. The State which is homogeneous has a population of about 6million and is predominantly occupied by the Yoruba people. Within the State however, there are sub-ethnic groups with distinct dialect peculiarities. The people of Oyo State may be divided into five broad groups which are: the Ibadans, the Ibarapas, the Oyos, the Oke-Oguns and the Ogbomosos. The State covers a total of 28,454 square kilometres of land mass and it is bounded in the south by Ogun State, in the

north by Kwara State, in the west it is partly bounded by Ogun State and partly by the Republic of Benin, while in the East by Osun State. The landscape consists of old hard rocks and dome shaped hills, which rise gently from about 500 meters in the southern part and reaching a height of about 1,219 metres above sea level in the northern part. The topography of the State is of gentle rolling low land in the south, rising to a plateau of about 40metres. The State is well drained with rivers flowing from the upland in the north-south direction. Oyo State has an equatorial climate with dry and wet seasons and relatively high humidity. The dry season lasts from November to March while the wet season starts from April and ends in October. Average daily temperature ranges between 25 °C (77.0 °F) and 35 °C (95.0 °F), almost throughout the year. The vegetation pattern of Oyo State is that of rain forest in the south and guinea savannah in the north. Thick forest in the south gives way to grassland interspersed with trees in the north. The state consists of thirty three local government areas. Agriculture is the main occupation of the people of Oyo State. The climate in the State favours the cultivation of crops like maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew, vegetables and so on [5]

The population of the study comprises all vegetable farmers in Oyo State, Nigeria. A Multistage sampling technique was used in collecting data from the vegetable farmers. The first stage involved random selection of two (2) agricultural zones out of the four (4) zones in the state, which are Ibadan/Ibarapa and Ogbomoso zones. The second stage involved a purposive selection of three (3) local governments from each of the two (2) zones selected based on high level of vegetable production in the area. The third stage involved random sampling of 3 villages/towns from each of the local governments. The last stage involved random selection of 10% from population of vegetable producers based on their cooperative society in each village. This gives a total of 240 vegetable producers.

Primary data was collected from the field through the use of structured interview schedule. Two major variables were measured in the study. Dependent and Independent variables. The dependent variable is the utilization of sustainable vegetable production technologies. The dependent variable was measured by asking the respondents, the frequency of their utilization of sustainable vegetable production technologies which was scored as follows: Always = 3, Sometimes = 2, Rarely =1, Never = 0. The independent variables consist of the socio-economic characteristics of vegetable farmers. Both descriptive statistics such as means, frequency count and Percentages and inferential statistics (Pearson Product Moment Correlation) were used to analyze the data.

III. Result and Discussion

Socio - Economic Characteristics of the Respondents

Table 1 shows the distribution of respondents according to their socio economic characteristics. Male respondents (71.3%) dominated the vegetable production in the study area. The bulk (72.5%) of the respondents fell between 31-50 years. This means that respondents involved in sustainable vegetable production in the area were in their productive years. Very few (5.0%) of the respondents claimed no formal education. This means that most of the respondents in the study area were literate but had low level of education. Majority (92.5%) of the respondents were married. This is an indication of availability of family labour on vegetable farm. The mean household size was 5 persons. It means that respondents had small household size. The mean years of vegetable production experience was 17 years. It implies that respondents had vast knowledge of vegetable production in the area. The mean farm size was 1.1 hectare. This means that farmers operate on small scale basis. The mean annual income from vegetable production was ₦256,000.33. This could be attributed to small scale operation of vegetable producers in the area.

Table1. Distribution of respondents according to their socio economic characteristics

Socio-economic characteristics	Frequency	Percentage
Gender		
Male	171	71.3
Female	69	28.7
Age (Years)		
≤ 30	9	3.7
31 – 40	90	37.5
41 – 50	84	35.0
51 – 60	51	21.3
61 and above	6	2.5
Years of formal education		
No formal education	12	5.0
≤ 6	48	20.0
7 – 12	138	57.5
13years and above	42	17.5
Marital status		
Not married	18	7.5
Married	222	92.5
Household size (persons)		
≤5	120	50.0
6 – 10	105	43.8
11 and above	15	6.2
Years of vegetable production experience		
6 – 10	15	6.2
11 – 15	48	20.0
16 and above	177	73.8
Farm size (hectares)		
≤2	222	92.5
3 – 5	18	7.5
Annual income from vegetable production(₦'000)		
≤ 250	36	15.0
251 – 750	201	83.7
751 – 1,000	3	1.3

Source: Field survey, 2017.

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Accessibility, Utilization Level and Sustainability of Sustainable Vegetable Production Technologies.

Data presented on Table 2 revealed that all the respondents (100%) accessed improved varieties of *Corchorus olitorius* and Amaranthus, 88.6% accessed bitter leaf, 62.5% accessed water leaf, 96.3% accessed Celosia (*Soko*), few of the respondents (38.0%) accessed pumpkin and 65.8% accessed *Solanum (Gbagba)*. This implies respondents accessed various improved vegetable types in the area. In addition, 8.8% accessed pump irrigation while 99.1% accessed watering-can/bucket for irrigation. This means that respondents still depend on the traditional irrigation to produce their vegetables. Also, some of the respondents (45.4%) accessed organic fertilizer. This implies that most of the respondents still utilize inorganic fertilizer in the area.

On the utilization level, the bulk of the respondents (97.5%) utilized *Corchorus Olitorius,* 82.4% utilized bitter leaf, all (100%) utilized *Amaranthus,* 61.3% utilized water leaf, (93.8%) utilized Celosia 65.8% utilized *Solanum* but only 38% utilized pumpkin. This means that respondents utilized various vegetables types in the study area. Also, only 8.8% utilized pump irrigation. However, 97.9% utilized watering-can/bucket for irrigation, some of the respondents (45.4%) utilized organic fertilizer. Majority (95.0%) claimed harvesting of vegetable always done in the morning/late in the evening. Also, 99.1% claimed harvesting is done at physiological maturity. This means that respondents had applied vast knowledge on harvesting of vegetables.

On sustainability, most of the respondents still put those technologies under consideration to use. This means that vegetable technologies under consideration strive well in the area and respondents will continue to use these technologies attached to the production of it.

Table 2. Level of utilization of sustainable vegetable production technologies.

	Accessibility		Utilization			Sustainability		
Sustainable vegetable technologies	Yes	No	Always	Sometime	Rarely	Never	Still in use	not in use
Improved Vegetable varieties								
Corchorus (Ewedu)	240 (100)	0	228(95.0)	6(2.5)	6(2.5)	0	240(100.0)	0
Bitter leaf (Ewuro)	213(88.6)	27(11.3)	63(26.2)	135(56.2)	15(6.2)	27(11.3)	198(82.4)	15(6.2)
Amaranthus (*Tete*)	240 (100)	-	237(98.8)	3(1.2)	0	0	225(93.8)	15(6.2)
Water leaf	150 (62.5)	90(37.5)	135(56.3)	12(5.0)	3(1.3)	90(37.5)	52(65.0)	27(34.2)
Celosia (*Soko*)	231 (96.3)	9(3.7)	162(67.5)	63(26.3)	6(2.5)	9(3.7)	231 (96.3)	0
Pumpkin	91 (38.0)	149 (62)	52(21.7)	39(16.3)	0	149 (62)	91 (38.0)	0
Solanum (*Gbagba*)	158(65.8)	82(34.2)	59 (24.6)	99(41.2)	0	82(34.2)	144(60.0)	14(5.8)
Water management								
Pump irrigation	21(8.8)	219(91.3)	21(8.8)	0	0	219(91.3)	21(8.8)	0
Watering can for irrigation	238(99.1)	2(0.9)	235(97.9)	0	3(1.2)	2(0.9)	238(99.1)	0
Fertilizer/ organic manure application								
Compost/poultry droppings	109(45.4)	131(54.6)	72(30.0)	37(15.4)	0	131(54.6)	109(45.4)	0
Harvesting								
Early morning / late evening	240 (100)	0	228(95.0)	12(5.0)	-	-	240 (100)	0
Harvesting at maturity	238(99.1)	2(0.9)	238(99.1)	0	0	0	238(99.1)	0
Source: Field survey, 2017.								

Problem Associated with Sustainable Vegetable Production Technologies.

Table 3 revealed that marketing of vegetable was not a problem to most (60.0%) the respondents. Pest and diseases infestation was a serious problem to (70.3%) of the respondents. Seed viability was a mild problem to 57.5% of the respondents. Inaccessibility to organic fertilizers was not a problem to 66.3% of the respondents. Water for irrigation mostly during dry season was a problem to 76.3% of the respondents. Inadequate access to land was a mild problem to 51.2% of the respondents. Soil erosion was a serious problem to 57.5% of the respondents. This implies that emphasis should be made to eradicate these problems towards formulating a virile sustainable vegetable production in the area.

Problems Associated with Sustainable Vegetable Production Technology

Problem*	Serious	Mild	Not a Problem
1. Marketing of vegetable	9(3.7)	87(36.3)	144(60.0)
2. Pest and disease	171(71.3)	69(28.7)	0
3. Seed viability	96(40.0)	138(57.5)	6(2.5)
4. Inaccessibility to organic Fertilizers	72(30.0)	9(3.7)	159(66.3)
5. Water for irrigation	18(76.2)	51(21.3)	6(2.5)
6. Inadequate access to land	21(8.8)	123(51.2)	96(40.0)
7. Soil erosion	138(57.5)	21(8.7)	81(33.8)

Sounrce: Field survey, 2017.
*Multiple response.

Pearson correlation analysis of the Relationship between numbers of accessed sustainable vegetable production technologies and utilization of the technologies.

Table 4 shows strongly significant relationship exist between numbers of accessed sustainable vegetable production technologies and utilization of the technologies ($r = 0.748$, $p = 0.000$). This means that the more the respondents access sustainable vegetable production technologies, the more the utilization level of those technologies.

Table 4. Pearson correlation analysis showing the relationship between numbers of accessed sustainable vegetable production technologies and utilization of the technologies

Variable	correlation coefficient (r)	P-value	Remarks
Numbers of accessed vegetable production technologies and utilization of the technologies	0.748	0.000	significant

Source: Field survey, 2017
Correlation is significant at 0.01 level

IV. Conclusion and Recommendations

It can be concluded based on the findings of the study that farmers accessed and utilized most of the sustainable vegetable production technologies include: Improved vegetable varieties: Corchorus, Bitter leaf, Amaranthus, Water leaf, Celosia, Pumpkin and Solanum; Water Management: Pump irrigation, watering can/ bucket; Organic manure application and Harvesting at various level in the study area. Also respondents put some technologies in continuous use while few were discontinued.

Based on the findings of the study, the following recommendations were suggested:

- Farmers should be given more extension education on the necessity to utilize inorganic fertilizers on their vegetable farms.
- Vegetable farmers can use their cooperative society to construct dams so that water will be made available during dry season for irrigation purposes.
- Farmers should be encouraged to patronize certified agro allied dealers on the purchase of seed to ensure viable seeds are purchased.

References

[1] Mawuli Z.R (2016): Investing in Vegetable production in Nigeria (editor) Nwandu O. Available online at https://www.welcome2africaint.com/single-post/2016/10/28/ Investing-in-Vegetable-production-in-Nigeria Accessed 12 December, 2016.

[2] Juroszek P., Lumpkin T.A and Palada M.C (2008): Sustainable Vegetable Production Systems, *Acta Horti.* 767, pp133-150.

[3] Food and Agricultural Organization (1992): Food and nutrition at the turn of the millennium. Information Division, FAO of the United Nation. Rome, Italy pg 2.

[4] Ibeawuchi I.I, Okoli N.A, Alagba R.A, Ofor M.O, Emma-Okafor L.C, Peter-Onoh C.A and Obiefuna J.C (2015): Fruit and Vegetable Crop Production in Nigeria: The Gains, Challenges and the Way Forward, *Journal of Biology, Agriculture and Healthcare,* 5 (2) pp 194-208.

[5] Oyo State Government (2018): The State. Available online at https://oyostate.gov.ng/about-oyo-state/

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