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Analysis of Dry Season Vegetable Production among Farmers in Benue State, Nigeria

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ABSTRACT

The study was carried out to analyze dry-season vegetable production among farmers in Benue State, Nigeria. Data were collected through the use of a structured questionnaire from a sample of 182 respondents. Frequency, percentage, mean score, standard deviation and factor analysis were used for data analysis. Findings indicated that 52.2% of the respondents were aged between 31 and 40 years, the majority (71.4%) were female, married (78.6%) and 74.2% had a household size of 3-6 persons, among others. Results also revealed that the major reasons for engaging in dry season vegetable production in the study area were improving food security and nutrition (M=2.93), income generation (M=2.90), access to vegetables for household consumption (M=2.90), eradicate extreme hunger and poverty (M=2.89) and employment generation (M=2.54). Findings further revealed that major perceived challenges of dry-season vegetable production in the study area were named infrastructural, input related and environmental factors based on the item loading for factors 1, 2 and 3 respectively. The study concluded that the respondents were engaged in dry-season vegetable production in order to increase household consumption and generate additional income for economic empowerment. It is recommended that creating an enabling environment for the business to thrive as well as provision of infrastructural and credit facilities will enhance increase in production.

INTRODUCTION

Vegetables are important components of human diets and can easily be cultivated on small areas of land. Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) recommended a daily vegetable intake of 200g per person but the Nigerian national average is below this value (Kintomo et al. 2014). This inadequate intake of fresh vegetables may further be worsened during the dry season when moisture scarcity limits the area under cultivation and the number of

vegetables that can be grown and supplied to the urban areas (Ojo et al. 2010).

Nigeria as a country is unable to meet its domestic requirements for vegetables, fruits, floriculture, herbs and spices. According to Food and Agriculture Organization (FAO) (2010), Nigeria imported a total of 105,000 metric tonnes of tomato paste valued at 16 billion nairas to bridge the deficit gap between demand and supply in the country from 2009 to 2010. Kalu (2013) attributed these situations to socio-economic constraints surrounding the key actors in

the tomato value chain, institutional weakness and declining agricultural research.

In Nigeria, there are two distinct seasons, the rainy and the dry seasons. The rainy season is the normal cropping season and this starts in April and ends in October while the dry season starts in November and ends in March. During the rainy season, production of vegetables is high resulting in the saturation of the market, but during the dry season there is usually a scarcity of this important farm produce thereby leading to a high price due to short supply (Ibekwe et al. 2010). Dry season vegetable production if practiced with the required agricultural techniques have the propensity of uplifting the financial condition of the farmers and hence better their standard of living.

The demand for vegetables also outstrips the supply; causing scarcity of the commodity. Omeh (2012) buttressed this fact when he opined that vegetable is used in a variety of dishes, and it is widely consumed raw as well. It is in high demand in Nigeria and sells for reasonably good prices. If farmers have high yields in their crops and the demand for such crops is high, this consequently gives rise to high prices which eventually accrue more income to the farmers. Under the analyzed condition, vegetable farmers in Benue State should have no relationship with poverty, but the poverty rate recorded in the State is as high as 74.1 percent (National Bureau of Statistics, 2012). Hence, this study focused on the analysis of dry season vegetable production among farmers in Benue State, Nigeria in order to fill this existing knowledge gap. The following research questions were pertinent to this study: What are the socio-economic characteristics of dry-season vegetable farmers in the study area? What are the reasons for engaging in dry-season vegetable production in the study area? What are the perceived challenges of dry season vegetable production in the study area?

Specifically, the study sought to:

- i. Describe the socio-economic characteristics of dry-season vegetable farmers in the study area;
- ii. Ascertain the reasons for engaging in dry season vegetable production in the study area; and
- iii. Identify the perceived challenges of dry season vegetable production in the study area.

METHODOLOGY

The study was carried out in Benue State, Nigeria. Benue State is one of the 36 States located in the North-Central part of Nigeria. The State has 23 Local Government Areas that are grouped into 3 agricultural zones, namely; the Northern zone, the Eastern zone and the Central zone. It has its headquarters in Makurdi. Benue State derives its name from the river Benue, the second largest river in Nigeria after the Niger. The state was created out of the Benue Plateau State in 1976. Benue State has a population of 4,219,244 people (Nigeria Population Commission, 2006) and a total land mass of 34,095km². It is located between longitude 80E and 100E and latitude 6030N and 8o8N (Benue State Agricultural and Rural Development Authority (BNARDA), 1998). The state shares boundaries with Cross River and Ebonyi States to the south, Enugu State to the south-west, Kogi State to the west, Taraba State and Nasarawa State to the East and North, respectively. It shares an international boundary with the Republic of Cameroon to the South East (BNARDA, 1998).

The population for this study consists of all dry season vegetable farmers in Benue State, Nigeria. However, since it was impractical to study the entire population, a sample size of the population was taken for the study. In the first stage, the population of the study was stratified into three agricultural Zones, namely; Zones A, B and C. In stage two, six Local Government Areas where vegetables were predominantly produced were purposively selected from each of the three agricultural zones.

In the first stage, the population of the study was stratified into three agricultural Zones, namely; Zones A, B and C. In stage two, six Local Government Areas where vegetables were predominantly produced were purposively selected from each of the three agricultural zones. The LGAs were Logo and Kastina-Ala from Zone A, Makurdi and Tarka from Zone B and Otukpo and Ohimini from Zone C. In the third stage, two rural communities were purposively selected from each of the LGAs based on the level of involvement in dry-season vegetable production. The rural communities were Wende and Aganyi in Logo LGA, Abaji and Ayua from Kastina-Ala LGA, Nyongu and Northbank in Markudi LGA, Mbakyaa and Gwarche in Tarka LGA, Anmeji and Ehatokpe in Ohimini LGA and Asa1 and Upu in Otukpo LGA.

Finally, a sampling frame was developed for each of the rural communities, and using the proportional allocation of 20% (0.2), a total sample size of 182 respondents was selected.

Data were collected using a questionnaire. Frequency, percentage, mean score, standard deviation, and factor analysis were used to analyze data collected for the study.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Age (years)

Table 1 shows that most (52.2%) of the respondents were within the age bracket of 31–40 years, 31.9% were within the age bracket of 41–50 years, 10.4% were aged between 21 and 30 years, while 4.1% were aged 51 years and above. The mean age of the respondents was 38 years. This implies that most of the farmers were within the productive age and have the physical strength to cope with the rigor of dry-season vegetable production. This result is similar to the findings obtained by Oladimeji and Abdulsalam (2012) who reported that dry-season farmers in their study area had a mean age of 38 years.

Sex

The majority (71.4%) of the respondents were female, while 28.6% were male (Table 1). This implies that women were more involved in dry-season vegetable production in the study area than their male counterparts. This result however disagrees with the findings of Dam (2012) who reported that in Benue State, dry-season vegetable farming is mostly dominated by men.

Marital Status

About 79% of the respondents were married, 9.9% of the respondents were single, 3.3% are divorced, and 8.2% were widowed (Table 1). This implies that a very large proportion of the farmers were married. This finding agrees with Adesope et al. (2014) who reported that most vegetable farmers in their study area were married.

Household size (numbers)

Results in Table 1 show that the majority (74.2%) of the dry season vegetable farmers had household sizes of between 3 and 6 persons, 23.1% had household size of 7-10 persons, while 1.6% had household size of more than 10 persons. The mean household size was about 6 persons. This implies that family labour was readily available for dry-season vegetable production in the study area. The significance of household size in agriculture hinges on the fact that the availability of labour for farm production, the total area cultivated for different crop enterprises, the amount of farm produce retained for domestic consumption, and the marketable surplus are all determined by the size of the farm household (Amaza et al. 2009).

Level of education

About 38% of the respondents in the study area had primary education, 31.3% had secondary education, 7.7% had tertiary education, and 23.1% of the respondents had non-formal education (Table 1). This is an indication that the farmers in the study area were to some extent educated and literate. This characteristic may have enabled them to make production management decisions that enhance dry season vegetable production in the area. Ogundari (2006) noted that education is needed to enhance productivity among farming households in Nigeria. The educational level of farmers is very important in farm management because a high literacy level of the respondents would afford them the opportunity to understand and adopt modern farm practices, thereby enhancing productivity and profitability.

Annual income (Naira)

Results in Table 1 show that about 57% of the respondents obtained between ₦50, 000.00 and ₦100, 000 annually, 29.7% had between ₦100, 001 and ₦150, 000, while 11.5% had ₦150, 001 - ₦200, 000. It shows that the respondents obtained low income from dry season vegetable production. This finding agrees with Ajani and Igbokwe (2014) who opined that small-scale farmers do not earn much from their farms.

Farm size (hectares)

Findings in Table 1 show that most (65.9%) of the respondents had a farm size of ≤ 1 ha, 28.6% had a farm size of 1.1–2ha, while only 5.5% had a farm size of 3 ha and above. The mean farm size was 1.40 hectares. This implies that the majority of the

respondents were small-scale farmers who practice on a subsistence level. This is consistent with the findings by Dam (2012) who reported that vegetable

farmers had farm sizes that were generally small and often less than a hectare.

Table 1: Distribution of socio-economic characteristics of the respondents (n=182)

Socio-economic characteristics	Frequency	Percentage (%)	Mean Score
Age (years)			
≤20	1	0.5	38.04
21-30	19	10.4	
31-40	95	52.2	
41-50	58	31.9	
>50	9	4.9	
Sex			
Male	52	28.6	
Female	130	71.4	
Marital status			
Married	143	78.6	
Single	18	9.9	
Divorced	6	3.3	
Widow/widower	15	8.2	
Household size (numbers)			
<3	2	1.1	5.96
3-6	135	74.2	
7-10	42	23.1	
>10	3	1.6	
Level of education			
Tertiary	14	7.7	
Secondary	54	31.3	
Primary	69	37.9	
Non-formal education	42	23.1	
Annual income (Naira)			
≤50,000	2	1.1	162747.25
50,001-100,000	103	56.6	
100,001-150,000	54	29.7	
150,001-200,000	21	11.5	
>200,000	2	1.1	
Farm size (hectares)			
<1	120	65.9	1.40
1-3	52	28.6	
>3	10	5.5	
Farming experience (years)			
≤5	16	8.8	6.80
6-10	137	75.3	
11-15	26	14.3	
>15	3	1.6	
Major occupation			
Artisan	30	16.5	
Farming	120	65.9	

Civil service	12	6.6	
Petty trading	20	11.0	
Extension contact			
No	171	94.0	
Yes	11	6.0	
Membership of formal organization			
Yes	27	14.8	
No	155	85.2	
Type of formal organization			
None	155	85.2	
Cooperative society	12	6.6	
Farmer's association	9	4.9	
Fadama User group	6	3.3	
Access to credit facilities			
Yes	39	21.4	
No	143	78.6	

Reasons for engaging in dry season vegetable production

Farming experience (years)

The majority (75.3%) of the respondents had farming experience of between 6 and 10 years, 14.3% of them had farming experience of 10-15 years, while 8.8% of them had farming experience of ≤ 5 years (Table 1). This shows that dry-season vegetable farmers in the study area were relatively experienced. Farming experience plays a significant role in agricultural production. It is expected that the higher the farmers' experience in farming, the better the production capacity of the farmers (Adeyemo et al. 2010).

Level of education

About 38% of the respondents in the study area had primary education, 31.3% had secondary education, 7.7% had tertiary education and 23.1% of the respondents had non-formal education (Table 1). This is an indication that the farmers in the study area were to an extent educated and literate. This characteristic may have enabled them to make production management decisions that enhance dry season vegetable production in the area. According to Gama (2013), the level of awareness and adoption of agricultural innovations are affected by the literacy status of farmers. Those who are literate are expected to be more innovative because of their ability to get information quickly and ability to take risks. Ogundari (2006) noted that education is needed to enhance productivity among farming households in Nigeria. The educational level of farmers is very important in farm management because a high literacy level of the

respondents would afford them the opportunity to understand and adopt modern farm practices, thereby enhancing productivity and profitability.

Extension contact

Table 1 further showed that the majority (94%) of the respondents did not have contact with extension agents in the last one year, while 6% had extension contact. This implies that there was poor interaction between farmers and extension agents on dry season vegetable production, which may likely result in inefficiency in production. Increased extension contacts can lead to more knowledge on improved dry season vegetable production technologies thereby increasing productivity and profitability. Umar et al. (2009) argued that increased extension contacts would increase the adoption of improved farm production technologies. They further argued that the frequency of extension contact is very essential as it guides the farmers from awareness to the adoption stage of innovation.

Findings in Table 2 show reasons for engaging in dry season vegetable production in the study area which include improving food security and nutrition ($M=2.93$), income generation ($M=2.90$), access to varieties of vegetables for household consumption ($M=2.90$), eradicating extreme hunger and poverty ($M=2.89$) and employment generation ($M=2.54$). All the standard deviations are less than one. This shows that there are uniformity in the responses of the respondents. This also implies that there are various reasons why respondents engage in dry-season

vegetable production in the study area which could be attributed to the overriding importance of vegetables. This is consistent with the findings by Ali et al. (2002) who opined that vegetables generate more jobs per

hectare, on-farm, and off-farm, than staple-based agricultural enterprises.

Table 2: Mean score of reasons for engaging in dry season vegetable production

Reasons	Mean Score	Standard deviation
Income generation	2.90	0.89
Employment generation	2.54	0.86
Consolidate land ownership	1.84	0.84
Utilize opportunity created by nearby markets	2.24	0.93
Utilize available land areas	2.34	0.92
Produce raw materials	1.64	0.74
Beautify the surroundings	1.43	0.54
Access to varieties of vegetable for household consumption	2.89	0.85
Eradicating extreme hunger and poverty	2.90	0.82
For healthy consumption	1.74	0.78
Medicinal purposes	1.77	0.77
Improving food security and nutrition	2.93	0.84

Perceived challenges of dry season vegetable production

Table 3 shows the outcome of factor loadings from principal component analysis after varimax rotation of the perceived challenges of dry season vegetable production in the study area. These constraints were listed according to the proportion of variance associated with them and were classified under three major factors, namely; infrastructural, input related and environmental factors.

Factor 1 (infrastructural factors): Infrastructural factors were inadequate irrigable land and water (0.888), high cost of irrigation equipment (0.845), inadequate credit facilities (0.838), pests and diseases problem (0.763), polluted water (0.762), inadequate farm inputs (0.705), high cost of transportation (0.697), high cost of hired labour (0.639) and inadequate market (0.542). This is consistent with the findings of Nnadi et al. (2012) who opined that the greatest limitation of the smallholder farmers is capital. Access to agricultural credit has been positively linked to agricultural productivity in several studies. Yet, this vital input has eluded smallholder farmers in Nigeria.

Factor 2 (input-related factors): Variables that loaded under input-related factors were lack of capital (0.923), high cost of fertilizer (0.923), poor visits by extension agents (0.796), high cost of agrochemicals (0.788), low access to credit facilities (0.692), land tenure insecurity (0.545), poor quality harvest (0.612), An important institutional constraint is the absence of a clear title to land. Group ownership of land in Nigeria has been associated with such problems as limited tenure security, restrictions on farmers’ mobility, and the inevitable fragmentation of holdings among future heirs (International Food Policy Research Institute, 2005).

Variables that loaded under factor 3 (environmental factors) include post-harvest losses (0.854), poor storage and preservation facilities (0.846), inadequate information on new technologies (0.666) and natural disasters such as drought (0.575). These constraints altogether pose a great threat to dry season vegetable production in the study area. This is in line with Ebewore and Achoja (2013) who posited that a major challenge faced by the majority of the vegetable farmers was poor storage and preservation.

Table 3: Factor analysis of perceived challenges of dry season vegetable production

Challenges	Components		
	Factor 1	Factor 2	Factor 3
Inadequate irrigable land and water	0.888	0.200	0.238
High cost of irrigation equipment	0.845	0.307	0.292
Inadequate credit facilities	0.838	0.256	0.261
Pests and diseases problem	0.763	0.215	0.221
Polluted water	0.762	0.306	0.314
Inadequate farm inputs	0.705	0.298	0.023
High cost of transportation	0.697	0.362	0.239
High cost of hired labour	0.639	0.061	0.201
Inadequate market	0.589	0.076	-0.066
Lack of capital	0.273	0.923	0.082
High cost of fertilizer	0.233	0.796	0.219
Poor visits by extension agents	0.191	0.788	0.210
High cost of agrochemicals	0.321	0.692	0.217
Low access to credit facilities	0.264	0.569	0.292
Land tenure insecurity	0.205	0.545	0.329
Post-harvest losses	0.140	0.236	0.854
Poor storage and preservation facilities	0.045	0.236	0.846
Inadequate information on new technologies	0.201	-0.202	0.666
Natural disasters such as drought	0.477	0.405	0.575

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Factor 1: Infrastructural Factors

Factor 2: Input-Related Factors

Factor 3: Environmental Factors

Conclusion and Recommendations

The study concluded that majority of the respondents were middle-aged, female, married, literate and have small household size. The respondents indicated that reasons for engaging in dry-season vegetable production were to increase household consumption and generate additional income for economic empowerment. It is recommended that creating an enabling environment for the business to thrive as well as provision of infrastructural and credit facilities will enhance increase in production. The study further recommends the need for the respondents to join cooperative society in order to have easy access to credit facilities that will enhance productivity.

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