Analysis of Vegetable Marketing Determinants and Performance in Taraba State, Nigeria

[*1]Reuben JONATHAN & [2]Williams ZANDING FIBI

[1]Department of Agricultural Economics and Extension, Taraba State University, Jalingo, Taraba State, Nigeria

[2]Taraba State Ministry of Agriculture and Natural Resources, Taraba State, Nigeria

[*]Correspondent Author

DOI: https://dx.doi.org/10.47772/IJRISS.2023.701127

Received: 23 September 2023; Accepted: 06 October 2023; Published: 11 November 2023

ABSTRACT

The study analyzed vegetable marketing determinants and performance in Taraba State, Nigeria. The specific objectives of the study were to describe the socio economic characteristics; determine the performance; examine the factors influencing the marketing margin; determine the structure of vegetable markets in the study area and identify the constraints associated with it. Multistage and random sampling procedures were employed in selecting 110 vegetable marketers for the study. The analytical tools employed were descriptive statistics, marketing margin, marketing efficiency index analysis, multiple regression and Gini coefficient analysis. Results revealed that 60% of the vegetable marketers were female with about 66.36% married and within the active age. The mean marketing experience was estimated at 8 years and majority, 89.09% of the marketers had access to market information with 85.45% using personal savings as their initial marketing capital. Marketing efficiency index of 114.40% indicated high efficiency with marketing margin of 24.48%. This implies that marketing of vegetable is profitable. The value of the coefficient of determination, (R^2) of 0.8864 indicates that 88.64% of the variation in the marketing margin of the marketers was explained by the variables used in the model. The Gini coefficient value of 0.6858 indicated high level of inequality in earnings among the marketers hence high concentration. The major constraints identified were price fluctuation, 89.09% and perish ability, 72.73%. It was recommended that high level of sensitization on good storage systems, all season production and provision of infrastructural facilities be made to curtail the menace identified in the study area.

Keywords: Vegetable marketing, profitability, marketers' concentration, Taraba State

INTRODUCTION

The majority of food consumed by people and animals comes from vegetables, which are a crucial source of nutrition for both groups. The actual amount of minerals, vitamins, and fiber found in vegetables is typically where the real value of vegetables lies, even though the quantity of proteins, minerals, and fats may be limited and vary from one vegetable to another (Girei et al., 2017). A daily intake of 400g of fruits and vegetables was suggested by the Food and Agricultural Organization/World Health Organization (FAO/WHO) Consultation on Diet, Nutrition, and the Prevention of Chronic Diseases (WHO, 2003). Vegetables are a class of essential protective foods in human nutrition because of the minerals and vitamins they contain (Ohen et al., 2014). For this reason, any balanced diet should include both fruits and vegetables, and the amount of vegetables needed per person per meal should be in the range of 45% of the total volume of food consumed (Balogun et al., 2015).

In many regions of Africa, vegetables are among the most significant and commonly grown food and

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

income-generating crops, according to Okunlola (2009). Both small-scale farmers and large-scale businesses cultivate them extensively. They can provide a high yield per unit of land and, as a result, produce a high income for vegetable growers. According to Agbugba et al. (2013), it amounts to 500,000 to 600,000 tonnes annually in West Africa. Vegetable output in Nigeria is huge, with some estimates for annual production citing mind-boggling numbers. Vegetable marketing is so complicated and difficult due to its unique qualities, which include perishability, seasonality, and the need for uniformity (Adebisi-Adelani et al., 2011).

The vegetables have historically received less marketing attention since they are seen as minor crops compared to cash and main crops (Thompson and Agbugba, 2013). However, it is crucial to remember that vegetable marketing is one of the most lucrative but risky agribusinesses due to their high perishability, price, and yield variations, as well as their unique features, combined with changing consumer demand that could lead to increased uncertainty faced by the marketers (Adebisi-Adelani et al., 2011). In light of this, concerns about the effectiveness of vegetable marketing have been present over time. As more people express interest in starting vegetable businesses, particularly as market intermediaries and help with distribution, vegetable marketing is gradually growing. The activity will guarantee a ready market for the goods as well as a reliable source of income for vegetable marketers.

REVIEW OF RELATED LITERATURE

Markets are places or settings where the dynamics of supply and demand, which determine prices, work (Olukosi et al., 2005). All the institutions and individuals involved are kept in close communication through the organization of the trade of goods. According to Kohl and Uhls (1998), a market is a place where economic operations are organized and facilitated as well as decisions about what to create and distribute are made. The interaction between sellers and purchasers is the focal point of the market concept. Both the towns' economic foundation and the local government's tax base are supported by the market. Thus, the market serves as a bridge between individuals with different racial, ethnic, and cultural backgrounds as well as an economic institution.

The agricultural market is a unique form of market with unique features that set it apart from other markets. These are mostly caused by elements that have an impact on the supply of agricultural goods and producers' circumstances. Marketing is the process of providing goods to consumers in the right form, at the right time, and at the right location in order to satisfy their demands. According to Asogwa and Okwoche (2012), marketing adds form, time, place, and possession utilities to goods and services, giving them economic worth. Marketing was described by Kotler and Keller (2012) as "an organizational role and a collection of processes for producing, conveying, and providing value to the consumers and for managing customer relationships for the benefit of the firm and the stakeholders. In the marketing process, buyers and sellers are connected and have the ability to respond to shifting supply and demand conditions (Achike and Anzaku, 2010).

In order to make products from producers available to consumers in the form they desire, at the location they desire, and for a price that is agreeable to both the producers and consumers for effecting a change of possession, Arene (2016) asserts that agricultural marketing encompasses all those physical, legal, and economic services. Agricultural marketing, according to Olukosi et al. (2005), Kohls and Uhl (1998), is the execution of all commercial operations engaged in the flow of commodities and services from the point of starting agricultural production until they are in the hands of the final consumer. This covers the assembly, handling, storage, transportation, processing, wholesale, retail, and export of agricultural commodities, as well as ancillary support services like market information, the creation of grades and standards, the trade in agricultural commodities, financing, and price risk management, as well as the institutions involved in

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

carrying out the aforementioned tasks.

However, socio-economic factors play important roles in marketing and have been studied by various academics. Marketing of agricultural products, such as fruits and vegetables, has historically been a job preference for women and young people in many parts of Nigeria. In their study on the marketing analysis of a few vegetables in Port Harcourt Metropolis, Rivers State, Ikechi and Ayman (2018) discovered that the majority (77.8%) of vegetable marketers were women. While Bakari and Usman (2013) found that the majority (53.33%) of respondents were women and that 58.67% of all respondents were married in the Yola-North and South local government districts of Adamawa state, Nigeria. This suggests that marketing for vegetables is a job that can be done by both men and women, albeit women tend to dominate the industry. It was found by Okonkwo et al. (2020) in the South-South zone of Nigeria, that the mean age of respondents was 38.7 years in the region; age also plays a crucial part in marketing since it aids marketers in carrying out laborious and demanding job. The less physically fit a businessperson is as they age, the more they will need to rely on hired help or agents to carry out their tasks.

According to Arua et al. (2020), another socioeconomic feature trait that affects agricultural marketing is the marital status variable, which is significant in household decision-making and confers responsibility on an individual. In their study, they came to the conclusion that most vegetable marketers in Port Harcourt (55%) were married. In a similar vein, Ibrahim et al. (2020) stated that education and experience are real tools for picking up fresh perspectives and abilities that have a favourable impact on the scope of an enterprise's revenue and profit. In addition, Joyce et al. (2020) reported that 42.8% of the marketers had 6 to 10 years of marketing experience in the Mubi Metropolitan region of Adamawa State, Nigeria. Due to business strategies and networking established over time, marketers who stay with a company for a longer period of time are better prepared to explore business prospects. Ikechi et al. (2018) study on household size found that households with 1-3 people made up the highest percentage (40%) of all households, followed by households with 4-6 people (32%) and 7-9 people (13%), and households with >9 people (5%). This suggests that the majority of marketers had larger households, indicating that these households had more people living in them and required more labor for family care as well as more mouths to feed.

In contrast to Joseph et al. (2018) argument, Kumar (2014) suggested that effective agricultural marketing helps to raise rural incomes in developing nations by boosting the producer's share of the consumer price. Additionally, they suggested that creating an effective and efficient marketing system is a crucial long-term strategy for adjusting to sustainable agricultural development. Other researchers' findings were reported by Isitor et al. (2016) in their study, which showed that fluted pumpkin has a marketing efficiency of 10.85, tomato has a marketing efficiency of 3.88, and okra has a marketing efficiency of 5.27 in Ifo and Ado-Odo LGAs. Fluted pumpkin is more efficient than the other crops. Other research by Osondu et al. (2014) in Kwara State on the performance of vegetable marketing revealed that, despite having higher marketing efficiencies than wholesalers, retailers made more profit than wholesalers, with marketing efficiencies of 160.60% and 167.40%, respectively. Egbeadumah et al. (2016) discovered tomato sellers' marketing to be economically effective in Abeokuta South, with a value of 1.31, indicating that for every naira invested, 0.31 naira or 31kobo was realized in the region.

According to Olukosi et al. (2005), marketing margin refers to the price differential that occurs as a particular commodity flows from the primary producer to the final customer. For a given commodity, the marketing margin is the difference between what the buyer pays for the finished good and what the producer is paid (Arene, 2003). In their study, Taye et al. (2013) observed that the largest wholesaler net marketing margin per basket, N698.4, was reported in the Iloro market (Central), followed by N601.1 in the Ogbese market (North), and the lowest was discovered in the Owena market (South) regions. Furthermore, Egbeadumah et al. (2016) reported that selling tomatoes is a lucrative industry with a marketing margin of 536 Naira per basket, while Umar et al. (2017) discovered that an average fresh tomato retailer received

margins of N808.2 and N10.5 at on and off season, respectively.

Market structure is defined as those characteristics of an organization of a market which seems to influence strategically the nature of competition and pricing within the market (Olukosi *et al.*, 2005). The Gini coefficient measures the inequality among values of a frequency distribution. The occurrence of non-competitive behaviour like collusion and income inequality is indicated by the Gini Coefficient's proximity to unity (Girei et al. 2017). Ndaghu et al. (2010) found that the structure and practices of vegetable selling in the Gombe State, Local Government Area of Kwadom Yalmatu Deba showed a high concentration of (0.69), which indicates non-competitive pricing behavior and inequality in incomes among the merchants.

Agricultural marketing, particularly the selling of vegetables, faces many difficulties. Numerous studies have been done that identify various barriers to the selling of vegetables in Nigeria. In their study on the effectiveness of vegetable marketing in peri-urban areas of Ogun State, Nigeria, Isitor et al. (2016) examined the challenges faced by vegetable marketers and found that the top three issues were vegetable spoilage, poor road networks, and insufficient access to capital. According to Bakari and Usman (2013), the two biggest issues facing vegetable traders in Yola's North and South Local Government Areas were inadequate capital and improper storage. In a related study by Ridwan et al. (2021) on Marketing analysis of vegetables in Enugu State, Nigeria, the major challenges faced by vegetable marketers included high shop rent, high transportation costs, low capital, price volatility, poor credit facilities, and a low supply of vegetables due to seasonal variation.

Statement of the problem

Every home needs a source of vegetables. In addition to being consumed domestically, vegetables like tomatoes also generate foreign exchange for their producer nations through exportation (Haruna et al. 2012). The tomato's high perishability deters many farmers from entering large-scale production and current growers from expanding their scale of production. As a result, both fresh and processed tomato products are expensive and have low productivity. Similar to this, due to its perishable nature, seasonality, and bulkiness, Bulama et al. (2020) classified marketing of vegetables as a complex phenomenon. Agbugba et al. (2013) state that in order to handle the tonnes of vegetables that are produced, an effective marketing mechanism will be necessary. In general, among other known variables, vibrations from transport trucks navigating undulations and imperfections on the roadways are what cause damages and losses in fresh product (Ibeawuchi et al., 2015). These elements may lower the profit that marketers can realize. Despite the fact that vegetables require specialized marketing facilities, the government used to focus more on production than marketing, which led to low productivity in the processing industries and high costs for both fresh and processed goods. According to Bulama et al. (2020), the market infrastructure and systems of better storage infrastructure need to be taken into account to maintain a constant supply of vegetables throughout the year. Examining how produce is obtained and used to close the shortfall gap between supply and demand is crucial to achieving this.

Marketers and farmers value the potential of vegetables. To increase agricultural productivity and employment, Nigeria must market its agricultural products and output. Agricultural marketing creates specialized production for higher efficiency and skills, opening doors for the exchange of goods and services. Additionally, vegetable marketing will have a huge impact on the rural sector, especially for households in Taraba State, who rely on it as a source of income and subsistence. Marketers of tomatoes, onions, and other vegetables will undoubtedly find the study's conclusions helpful in developing appropriate marketing strategies for their products while reducing marketing expenses. Therefore in order to ensure that farmers and marketers get a high return on their capital investment, the study aimed at analyzing the marketing of some selected vegetables in Agricultural Zone I of Taraba State. Hence, the study was

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

designed to provide answers to the following research questions:

1. What are the socio economics characteristics of vegetable marketers in the study area?
2. What is the performance of vegetable marketing?
3. What are the factors influencing marketing margin of vegetable marketers?
4. What is the structure of vegetable market in the area? and
5. What are the constraints associated with vegetable marketing?

Objective of the study

The aim of the study was to analyze the determinants and performance of some selected vegetables marketing in Agricultural Zone I of Taraba State, Nigeria. The specific objectives of the study were to:

1. describe the socio economic characteristics of vegetable marketers in the study area;
2. determine the performance of vegetable marketing;
3. examine the factors influencing marketing margin of the marketers;
4. determine the structure of vegetable market; and
5. identify the constraints associated with vegetable marketing.

MATERIALS AND METHODS

The study area

The study was conducted in Zing, Yorro and Jalingo Local Government Areas (LGAs) of Agricultural Zone I of Taraba State, Nigeria. Agricultural Zone I is made up of six LGAs namely; Jalingo, Ardo-Kola, Zing, Yorro, Lau and Karim-Lamido with their headquarters at Zing, see (Fig. 1). Yorro which happens to be one of the LGAs selected lies between latitude $8^0$53' North and longitude $11^0$33' East sharing borders with Lau to the North-west, it has a total population of 89,865people (NPC, 2006) census and a land area of 1,160Km^2 with Mika market as one of the major markets. Zing LGA lies between latitude $8^0$53' North and longitude 11 ^{0}44' East, it has an area of 1,030Km^2 and a population of 127,363people (NPC, 2006) having its major market at Zing main market. Farming is an important occupation of residents in Zing and Yorro LGA which enable them to have most of the vegetables they sell. Jalingo LGA, which is the capital of Taraba State, lies in the savannah region, covered foothills of the shebshi mountain about 25 miles (40Km^2) South-east of Benue River connected by road via Yola and Wukari. It lies between latitude $8^0$53' N and longitude $11^0$23' E and has a land area of 195Km^2 with a population of 139,845persons (NPC,2006)

The study area lies in the tropical region with distinct wet and dry seasons. The wet season is between (April –October) while the dry season is between (November to March) with annual rainfall ranging from 500mm to 1000mm per annum (TADP, 2016). Farming is the key economic activity in the study area producing food crops like maize, groundnut, rice, yam, sorghum and so on. Vegetables produced include tomato, onion spinach, sweet pepper, sorrel and others. The vegetation of the area also provides good pasture for rearing animals and the riverside area for fishing activities. The people in the area also engage in other livelihood activities which include hunting, trading, blacksmithing and so on. The main ethnic groups found in the area are Mumuye, Yandang, Jenjo, Wurkun, Jukun-Kona, Hausa/Fulani and others just to mention few.

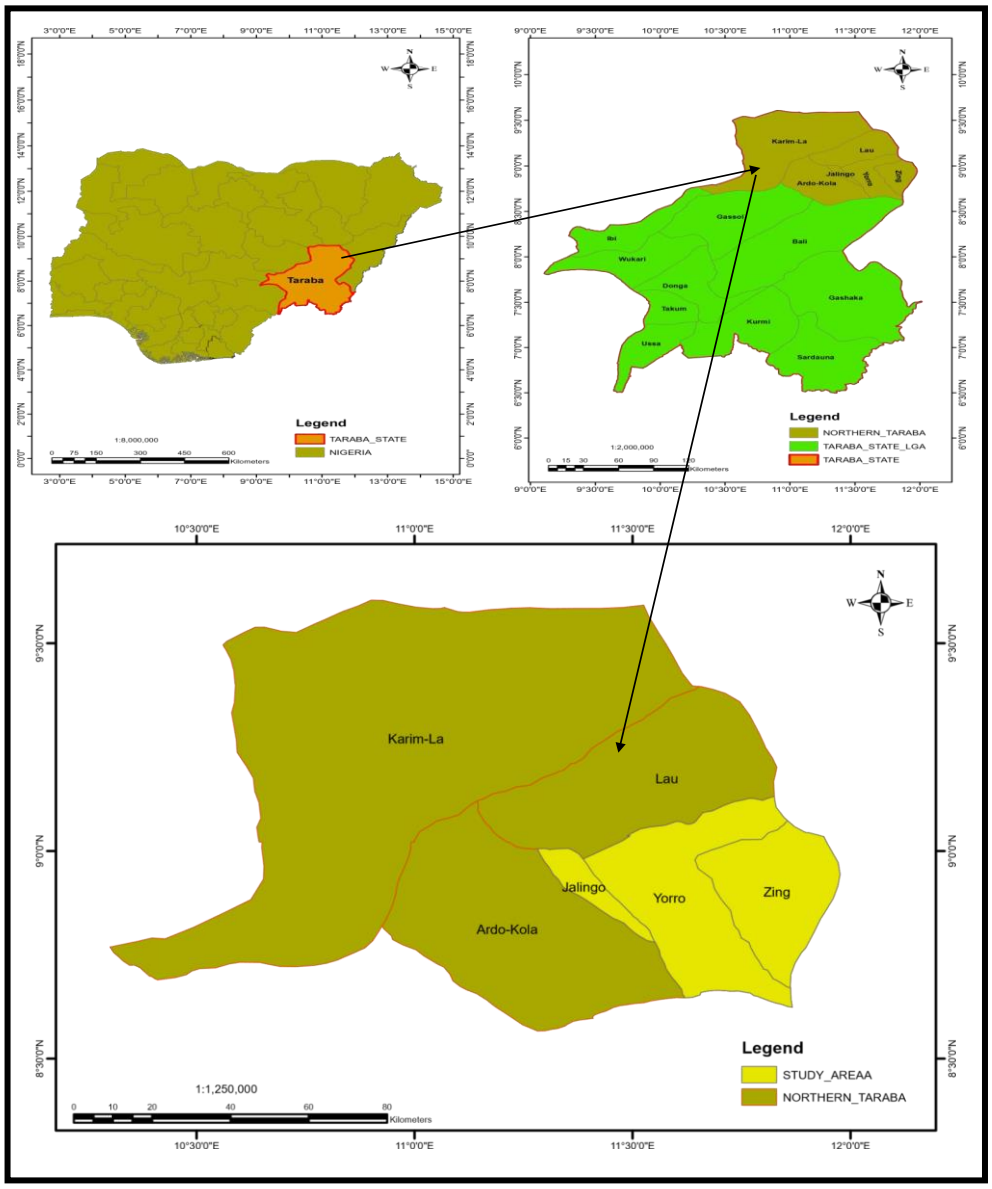

Figure 1: Map of Tararba State, Showing the Study area.

Source: Geography Department. Taraba State University, 2022

Sampling procedure and sample size

Multi-stage sampling procedure was employed for the study, Snowball and simple random sampling technique was used in the selection of the respondents, According to Taraba State Agricultural Development Programme (TADP, 2016), there are four (4) operational zones in the state, namely: – Zone I, II, III and IV. Zone I comprises of Ardo-Kola, Jalingo, Lau, Karim-Lamido, Yorro and Zing LGAs with headquarters at Zing. Zone II has Wukari, Ibi, Gassol and part of Bali (Garba-chede/Dakka) LGAs with headquarters at Wukari. Zone III comprises of Takum, Donga, Ussa, Kurmi, part of Bali (Bali/Suntai) LGAs, and Yangtu and Ngarda Special Development Areas (SDAs) with headquarters at Takum. Zone IV has only Sardauna LGA probably because of its difficult terrain with the headquarters at Gembu.

In the first stage, purposive sampling was used to select three out of five LGAs in Zone I because of the predominance production and marketing of the produce in the area. Secondly, Snowball sampling procedure enables us to identified major vegetable markets and marketers in the selected LGAs. The three major

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

markets identified were Tashan Lau in Jaligo LGA, Zing town Market in Zing LGA and Mika market in Lau LGA. Thirdly, simple random sampling technique was used in selecting 110 marketers to form the sample size from the sample frame size of 155 marketers as clearly presented in Table I using Yamane (1967) formula as illustrated in equation 1.

Taro Yamane Formula.. $N = n/(1+n(r2))$ ..... (1)

Where: n = Sample size, N = Total population of vegetable marketers in the study area, r^2 = Confidence Interval (0.05)

Table1: Distribution of questionnaire administered in the study area

S/No	LGA	Markets	Population	Sampling size
1	Jalingo	Tashan Lau	75	52
2	Yorro	Mika	34	23
3	Zing	Zing	46	35
Total	3	3	155	110

Source: Field survey, 2022

Method of data collection

The targeted population for the study comprised of vegetable marketers in Agricultural Zone I of Taraba State, Nigeria**.** Data for this study were collected mainly from primary source. This was done manually through the administration of structured questionnaire to the respondents. Questionnaire administration was done by the researcher and some research assistants who were carefully selected and trained. Data collection was done in the month of August to October, 2022.

Analytical techniques

The analytical tools that were used in analyzing the data collected include the followings:

Descriptive statistics

Descriptive statistics involved the use of central tendency such as means, percentages, and frequency distributions to describe the socio-economic characteristics of vegetable marketers, objective (i) and constraint associated with vegetable marketing, objectives (v)

Marketing margin analysis

Marketing margin has remained an important tool in analyzing the performance of marketing systems. It is the difference between what the consumer pays for final product and the amount the producer receives (Arene, 2003). It is expressed in equation (2) as:

$MM = SP – CP$ ..... (2)

Where: MM = Marketing margin (N), SP = Selling Price (N), CP = Cost Price (N)

In percentage, it can be expressed as shown in equation (3)

MM = (selling price- cost price)/(cost price) × 100/1 .....(3)

Marketing efficiency index

The marketing efficiency (ME) used to achieve objective (ii) showing the performance of marketing, was computed following Olukosi *et.al*. (2005) as shown in equation (4) and (5) by Shepherd Futrel Model indicated as:

ME = (Output of marketing)/(Input of marketing) × 100/1 .....(4)
ME = (Total Revenue)/(Total Cost) × 100/1 .....(5)

Olukosi and Isitor (1990) estimated marketing efficiency by dividing output of marketing by input of marketing and multiplied by 100, where output of marketing was proxy as net returns from marketing activities and input of marketing was proxy as cost of marketing activities. If the marketing efficiency coefficient equals one, the marketing is efficient but if it is less than one the market is not efficient. On the other hand, if the marketing efficiency coefficient is greater than one then the market is highly efficient.

Multiple regression analysis

This was used to analyze factors influencing marketing margin of the marketers, objective (iii). The Economic, econometrics and statistical criteria were used in selecting best functional form among linear, semi log, double log and exponential functions. It is expressed explicitly as seen in equation 6:

$Y= f (X_1, X_2, X_3, X_4, X_5, X_{6,} X_7) + e_i$ ..... (6)

Where:

Y = Marketing Margin (N)

X_1 = Sex (male=1 otherwise 0)

X_2= Age of the respondents (years)

X_3 = Educational level of the respondents (measured by number of years spent in school)

X_4 = Access to credit (access=1 otherwise 0)

X_5 = Selling Price (N)

X_6 = Initial capital (N)

X_7 = Marketing experience (years)

The functional forms that were tried in explicit form are shown in the following equations

Linear Function

$Y= \beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\cdots\beta_7 X_7+ei$ ..... (7)

Exponential Function

$LnY= \beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\cdots\beta_7 X_7+ ei$.....(8)

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

Semi-log Function

$Y= \beta_0+\beta_1 \ln X_1+\beta_2 \ln X_2+\beta_3 \ln X_3+\cdots\beta_7 \ln\beta_7+ei$ .....(9)

Double log function

$\text{Log}Y = b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3+\ldots b_7\log X_7+ e_i$.....(10)

β_0=intercept

β_1- β_7 =estimated

parameterse_i= error term

Variables explanation

Dependent Variable (Marketing Margin): According to Arene (2003) and Ibrahim et al. (2020), the marketing margin is the difference between the prices paid by producers and consumers for an identical amount and quality of a given good. Among the independent variables are:

Sex is assessed in the model as a dummy variable with a value of 1 for male and 0 for female. It can refer to either of the two sexes (male or female). With expected positive (+) sign.

Age is the number of years that a person has been alive and actively involved in life (the activeness or strength input). This variable on marketing margin is predicted to have a negative relationship. As you get older, your business engagement becomes less active, and vice versa. Educational level– it is generally considered an important variable that could enable them have access to business information and technical know-how like credit and information on prices of vegetables. It is measured by number of years spent in school, with expected positive co-efficient.

Access to credit is one of the elements that might help marketers enhance their marketing margins. The capacity for corporate expansion may depend on its availability. This was measured using a dummy variable, with "Yes" denoting credit availability and "No" denoting a marketer's inability to obtain credit. The expected sign of the co-efficient is (+).

Experience in marketing is the duration of time spent in the industry. Most people, Ibrahim et al. (2020) agreed that experienced marketers would be more effective at carrying out the marketing activities and would therefore make more money. Years were used to measure it and the expected sign of the coefficient is positive (+). The researcher used the software E-views, version 10, to analyze the variables affecting the marketers' marketing margin.

Gini coefficient index

The Gini coefficient index and Lorenz curve were used to determine the income distribution (concentration) among the marketers so as to determine the structure of the market. Reuben and Mshelia (2011); Girei et al. (20017) used Gini coefficient to determine the structure of yam markets in Southern Part of Taraba State and vegetable market structure in Nasarawa State, respectively by using the formula:

$GC = 1 - \sum XY$ .....(11)

Where: GC = Gini coefficient, X = the proportion of vegetable marketers, Y = the cumulative proportion of total sales (income), $\sum$ = Summation sign. When the determined coefficient value is (high) close to 1,

itmeans more inequality in terms of earnings, with less concentration in the market. But where the value is tending towards 0, with the marketers having equal earnings and concentration then they can compete with one another in terms selling and buying in the market.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The majority (60%) of respondents in Table 2 were female, indicating that women are primarily responsible for marketing vegetables in the Zone. This may be due to the widespread perception that women are more successful in marketing than men in terms of gaining favour with consumers and attracting them to their products. Similar results were attained by Ikechi and Ayman (2018) in their investigation of the marketing of particular vegetables in the Port Harcourt Metropolis of Rivers State, Nigeria, where the majority (77.8%) of vegetable marketers were women. Furthermore, it suggests that both men and women can participate in vegetable marketing; however women are more likely to partake in this business.

Age is an important factor in marketing since it enables marketers to complete difficult tasks. According to Table 2, the average age of vegetable marketers in the study area was assessed to be 39 years old, ranging from 19 to 62 years old. The distribution reveals that the majority of marketers (57.27%) were in the 19–40 age group, with only approximately 43 marketers being 41 years of age or older. This suggests that vegetable marketers were enthusiastic and young. This outcome is consistent with that of Okonkwo et al. (2020), who discovered that respondents' average ages in the South-South Zone of Nigeria were 38.7 years old. A businessperson's ability to physically carry out operations decreases with age, necessitating a greater reliance on hired labor or agents.

The socioeconomic factor of marital status affects household decision-making and bestows accountability on a person. The distribution of respondents' marital status revealed that the majority (66.36%) of them were married, which was consistent with the findings of Arua et al. (2020), who revealed in his study that the majority (55%) of vegetable marketers in Port Harcourt were married. On the other hand, the results showed that over 80% of the marketers attended one type of education or the other. This is in consonants with Ibrahim et al. (2020) who asserted that education is essential for the management and growth of any business. An individual's managerial abilities will be more effective when more literate than an individual that is illiterate.

The success and stability of any business depends on the skill and experience of the manager. Ibrahim *et. al*. (2020) opined that education and experience are veritable tools for acquiring new ideas and skills which reflect positively on the scope of enterprise's income and profit. The distribution of marketing experience of the respondents in Table 2 showed that over 60 % had marketing experience above 6 years, with a mean of 8years. This result indicated that the marketers are well experienced in vegetable marketing as this may likely have a positive implication on the marketing efficiency. The longer marketers stay on a business, the better they would be equipped in exploring the business opportunities as a result of business tactics and networking developed over the years. This finding corroborate with the results of Joyce *et al*. (2020) on the analysis of fresh tomato retail marketing in Mubi metropolitan area Adamawa State, Nigeria that 42.8% of the marketers had 6 to10 years marketing experience.

Production companies, retailers, consumers, the government, and academic institutions all depend on market intelligence. According to the distribution of respondents depending on their access to market information, which is shown in Table 2, the majority of respondents (89.09%) had this access, while just a small percentage, 10.91%, did not. The inference is that marketers are more likely to make wise marketing decisions that would increase economic returns if they are up to speed with the most recent knowledge about

the marketing system.

Table 2: Socio-economic characteristics of the respondents

Variables	Frequency	Percentages(%)	Mean
Sex			
Male	44	40	
Female	66	60	
Age(years)			
≤20	8	7.27	
21-30	24	21.82	
31-40	31	28.18	39
41-50	27	24.55	
≥50	20	18.18	
Min =19			
Max = 62			
Marital status			
Single	22	20	
Married	73	66.36	
Divorced	5	4.55	
Widow	10	9.09	
Level of education			
No formal	15	13.64	
Primary	28	25.45	
Secondary	55	50	
Tertiary	12	10.91	
Experience(years)			
5-Jan	41	37.27	
10-Jun	46	41.82	
15-Nov	10	9.09	
16-20	7	6.36	8
≥21	6	5.46	
Market information			
Yes	98	89.09	
No	12	10.91	

Source: Field survey, 2022

Performance of vegetable marketing

Two methods were used to evaluate the effectiveness of the local vegetable market, namely the efficiency of the business and the marketing margin.

Marketing margin of the vegetable marketers

Tomato, sweet pepper, and onion each had a marketing margin for the marketers of 20.97%, 22%, and 28.21%, respectively, as shown in Table 3. The fact that onions can be preserved for a longer period of time than other foods may be the reason for their higher profit margin. Additionally, the high margin of onion could be caused by the fact that the produce are more frequently used in the area than others which leads to a high demand of it. The result in Table 3, also showed that the total margin of all the vegetable sellers was 24.48%, implies that 1% increase in the purchase of onion will lead to an increase in the selling price of onion by28.21%, this also applied to that of sweet pepper and tomato marketers by 22% and 20.97% respectively. Therefore, the greater the work involved in changing a form of a product and providing services to satisfy the consumers' need, the greater the marketing margin. The studied by Bakari and Usman (2013) in Adamawa State, Nigeria disagreed with this finding that sweet pepper is the most profitable vegetable marketing venture with a gross margin of N4,399.15 and a marketing margin of N349.15 per basket. The results showed good performance since there was a moderate changed in the marketing margin of the vegetables marketed.

Table 3: Marketing margin of some selected vegetables N/100 kg bag

Marketing cost	Tomato N/100 kg bag	Sweet pepper N/100kg bag	Onion N/100 kg bag	Total for all vegetables N/100 kg bag
Cost of purchase	5,400	8,000	10,000	23,400
Transportation cost	100	100	500	700
Tax	50	50	50	150
Labour	100	120	150	370
Storage	50	–	–	50
Marketing materials cost	500	500	1,000	2,000
Total marketing cost	6,200	8,770	11,700	26,670
Selling price	7,500	10,700	15,000	33,200
Marketing margin	20.97%	22.00%	28.21%	24.48%

Source: Field Survey, 2022

Marketing efficiency

The sum of the transportation, market tax, labor, storage, marketing material, and product costs was calculated to be the total marketing cost. Table 4 displays the total expenses and total revenue. Sweet pepper marketing was significantly more effective than that of the other vegetables, with a value of 119.04% compared to tomatoes'98.05% and onions' 113.78%. Vegetable marketing was quite effective in the research area, as seen in the results presented in Table 4, where the total marketing efficiency value for all the vegetables was 114.40%. It shows that marketers can achieve break-even and generate a profit of roughly 14.4%. This proves that the businesses are not just successful but also potentially long-lasting. The results concur with that of Bulama et. al. (2020) on the studies of vegetable marketing in Abuja Municipal Area Council obtained a marketing efficiency value of 106% for tomato, 126% for pepper, and 107% for onion.

Table 4: Marketing efficiency computation for vegetables N/100 kg bag

Items	Tomato N/100 kg bag	Sweet pepper N/100kg bag	Onion N/100 kg bag	Total for all vegetables N/100 kg bag
Marketing cost	138599	543700	407200	1089499
Total revenue	135900	647200	463300	1246400

M.E %	98.05%	119.04%	113.78%	114.40%

Source: Field Survey, 2022

Factors influencing marketing margin of vegetable marketers

The results as presented in Table 5 depicts the findings of the ordinary least square regression analysis conducted to look at the variables affecting vegetable marketers' marketing margin. Based on monetary, econometric, and statistical considerations, the lead equation was decided upon as the double log function that is equation 10. In all the explanatory variables, 6 out of the 7 explanatory variables included in the model had coefficients that were significant at various levels of significance and had the predicted co-efficient signs except age which had positive sign instead of negative. The factors that were analyzed includes: Sex (X_1), age (X_2), education (X_3), access to credit (X_4), selling price (X_5), initial capita (X_6), and marketing experience (X_7). The data fitted the model well, as shown by the coefficient of determination (R^2) value of 0.8864, which shows that 88.64% of the variation in the marketers' marketing margins can be accounted for by the model's variables. The value of the F-Statistics indicates that the entire model is likewise significant at the 1% level.

It was found that the sex of the marketers did not have any significance in the marketing margin of the business. On the age of the marketers, the calculated age coefficient of 0.234, which is statistically significant at the 5% level, even though contradicts the expected negative sign means that a rise in age will result in an increase in the marketers' marketing margin. This is to be expected because becoming older is likely to bring about a gain in the marketing process in terms of handling, packaging and bargaining with customers to attract more marketing margins. In addition, vegetable marketing require less hard labour but more of experience, of course in improving the effectiveness of marketing initiatives. The findings agreed with Okonkwo et al. (2020) in the South-South Zone of Nigeria that age also plays a crucial part in marketing since it aids marketers in carrying out marketing functions.

The respondents' level of formal education had a positive coefficient and was significant at 5% level, suggests that the more educated they are the more marketing margin accrued in their businesses. It variably means a percent increases in the level of education increased marketing margin by 3 percent, which is impressive. This result is line with the assertion made by Ibrahim et al. (2020) who stated that education and experience are real tools for picking up fresh perspectives and abilities that have a favourable impact on the scope of an enterprise's revenue and profit. This is paramount to note that education is essential for the marketers to better understand and use the available information and techniques in increasing their profit margin.

Furthermore, increase in respondents' credit access would enable them acquire more modern facilities which will variably result in an increase in the marketers' marketing margin. According to Bulama et al. (2020), the market infrastructure and systems of better storage infrastructure need to be taken into account to maintain a constant supply of vegetables throughout the year. The results in Table 5 indicated that access to credit facilities positively increase the marketing margin of the marketers in the area. It also means that a percent increase in credit facilities will increase the vegetable marketing margin by 2 percent in the Zone which is commendable and encouraging if facilitated. According to the coefficient of selling price, a rise in the selling price of a marketer would result in an increase in the marketer's marketing margin. This implies that as the selling price rises by a percent, the marketing margin appreciably rises by 66 percent while all other variables remain constant. This result depict to us that in all the variables, selling mechanism is a key factor in determining the marketing margin in vegetable business. The results is in conformity with the findings of Ndaghu et al. (2010), who found that the structure and practices of vegetable selling in the Gombe State,

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

Local Government Area of Kwadom Yalmatu Deba showed non-competitive pricing behavior and inequality in incomes among the merchants.

Initial capital is statistically significant at the 1% probability level and positively affected the marketing margin of marketers in the research area. This might be anticipated because marketers who invest a lot of money should have a bigger marketing margin because marketing activities benefit from economies of scale. On the other hand, the positive coefficient of marketing experience in vegetable marketing lead to an increase in marketing margin. It shows that experience is statistically significant at 1% level and a percent increase in year of experience of the marketers will increase marketing margin by 26 percent keeping other variables constant. This indicates that more seasoned marketers generate better sales margins than less seasoned ones. In a similar vein, Ibrahim et al. (2020) stated that experience are real tools for picking up fresh perspectives and abilities that have a favourable impact on the scope of an enterprise's revenue and profit.

Table 5: Factors influencing the marketing margin of marketers

Variables	Coefficient	Standard error	t-ratios
Sex (x_1)	0.012	0.009	1.36
Age (x_2)	0.234	0.099	2.35**
Education (x_3)	0.032	0.013	2.50**
Access to credit (x_4)	0.024	0.011	2.22**
Selling price (x_5)	0.667	0.065	10.34***
Initial capital (x_6)	0.192	0.063	3.04***
Experience (x_7)	0.266	0.073	3.65***
Constant	-0.714	0.287	-2.49**

Source: Field survey, 2022

R-squared = 0.8864, Adj R-squared = 0.8786

F (7, 102) = 113.74***, Prob > F = 0.0000

***P<0.01 ** P<0.05 *P<0.10

Market structure of vegetable marketers

The Gini Coefficient analysis was used to measure the structure of vegetable

markets in the study area and the result is as presented in Table 6. The marketers having weekly sales of not more than N20,000 constituted about 49%, those making weekly sales of N20,001–N40,000 were 39% consequently, marketers with weekly sales of N40,001 – N80,000 were 14%, while those with weekly sales of N80,000 and above were 8%. The computed Gini Coefficient index was 0.68 indicating a relative high level of inequality in the earnings of the marketers, an indication of high concentration of the marketers. By implication, high income individuals receive much larger percentage of markets total income. The findings agreed with that of Ndaghu et al. (2010), who found that the structure and practices of vegetable selling in the Gombe State, Local Government Area of Kwadom Yalmatu was 0.69, which indicated non-competitive pricing behavior and inequality in incomes among the merchants. The value of the Gini coefficient is an indication of imperfect market system that is characterized by low competition. By implication, there are large number of buyers and sellers and there is also free entry and exit into the market.

In addition, Fig. 2, shows the Lorenz curve for vegetable marketing in the zone, indicating the divergence of the observed curve from the line of equal distribution (LED). This gives a visual measure of the concentration of sellers in vegetable marketing, thus, there was income inequality in the marketing of the vegetables, which led to high concentration of sellers and market power in the markets. This exhibits features of imperfect market of monopolistic nature.

Table 6: Computation of Gini coefficient of vegetable marketers

Income (N)	No of sellers	Prop. of sellers (X)	Cum. Prop. of sellers	Total sales (N)	Prop. of income	Cum Prop. of income (Y)	XY
< 20,000	49	0.4455	0.4455	310,900	0.0878	0.0878	0.0391
20,001-40,000	39	0.3546	0.8001	1,064,900	0.3008	0.3886	0.1378
40,001-60,000	10	0.0909	0.891	439,100	0.124	0.5126	0.0466
60,001-80,000	4	0.0364	0.9274	280,000	0.0791	0.5917	0.0215
80,001-100,000	1	0.009	0.9364	100,000	0.0283	0.62	0.0056
> 100,000	7	0.0636	1	1,345,340	0.38	1	0.0636
Total	110			3,540,240			∑XY= 0.3142

Source: Field Survey, 2022

GC = 1-∑XY

1- 0.3142= 0.6858

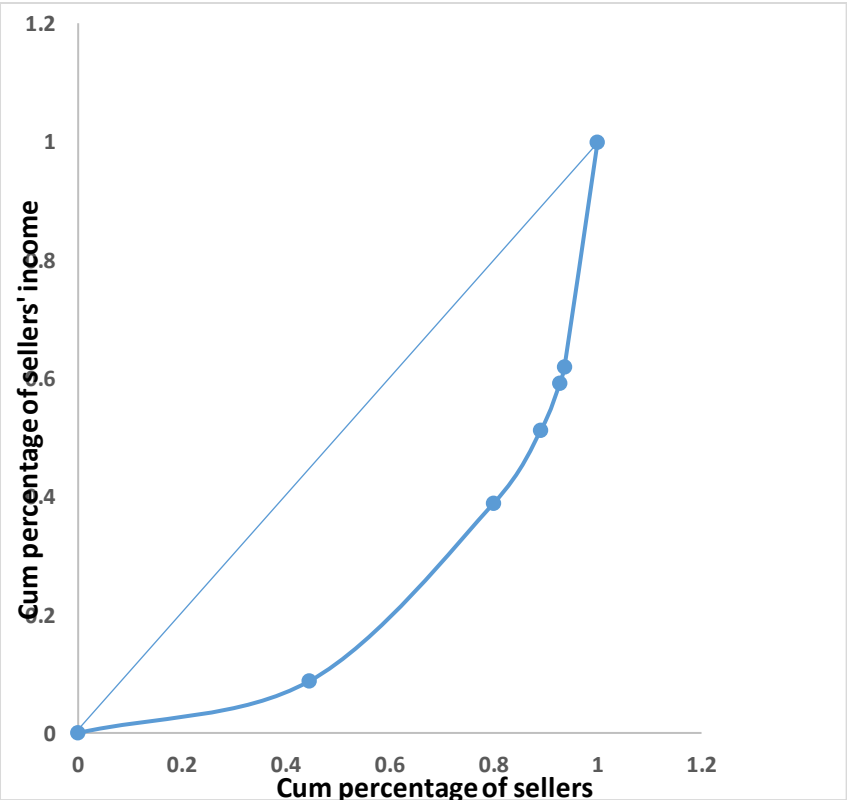

Fig. 2: Lorenz curve for vegetable marketing in Agricultural Zone I of Taraba State markets.

Constraints associated with vegetable marketing

The results of constraints to vegetable marketing are as shown on Table 7. The results revealed that the most severe constraints to vegetable marketing were price fluctuation (89.09%) and perishability (72.73%) as they were ranked first and second respectively. Similar results were obtained by Oladejo and Oladiran (2014) in Oyo State Nigeria where 78.8% of tomato marketers faced the problem of rapid deterioration in tomato quality due to the perishable nature of tomato. The challenge of price fluctuation could be as a result of low production caused by problem of seasonality. This finding also agreed with that of Arua *et al.* (2020) in Onitsha Metropolis of Anambra State, that vegetable prices increase during the off season. It was also reported that the seasonal nature of tomato production is considered as bottlenecks which hampers all years round availability and causes fluctuation in prices of the product. Considering the inadequate storage facilities and high perishability, farmers are easily exploited by the wholesaler and are forced to sell their produce at low prices thereby earning low profit from the business.

Table 7: Constraints of vegetable marketing in the study area (n=110)

Constraints	Frequency n=100	Percentage (%)	Rank
Price fluctuation	98	89.09	1
Perishability (spoilage)	80	72.73	2
Inadequate credit facility	50	45.45	3
Inadequate storage facilities	45	40.91	4
Irregular supply	42	38.18	5
Seasonality	35	31.82	6
Low price of the commodity	21	19.09	7
Location not strategic enough	15	13.64	8
High cost of production	10	9.09	9
Inadequate market information	9	8.18	10
High marketing commission	6	5.45	11

Source: Field survey, 2022

Multiple response*

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings from the study showed that vegetable marketing was a profitable business in Agricultural Zone I of Taraba State. Furthermore, it was revealed that the women dominated the business and that vegetable market was competitive. However, the business is bedeviled by constraints which were predominantly price fluctuation and perishable (spoilage) nature of the produce.

Recommendations

Based on the findings of this study, the following recommendations were made

1. Government should improve rural infrastructure (poor feeder roads) which would facilitate faster delivery of vegetables to reduce spoilage.

2. It is also recommended that NGOs and the government should strengthen extension service especially in the aspect of market information to marketers in order to enlighten them on how best they can preserve the produce to have even distribution all season round.
3. There is need for marketers to be educated by the NGOs on efficient vegetable storage methods as this would reduce spoilage and economic losses.

REFERENCES

1. Achike, A. I. & Anzaku, T. A. K. (2010). Economic analysis of the marketing margin of benniseed in Nasarawa State, Nigeria. *Journal of Tropical Agriculture, Food, Environment and Extension,* 9(1):47-55.
2. Adebisi-Adelani, O., Olajide-Taiwo, F. B., Adeoye, I. B. & Olajide-Taiwo, L. O. (2011). Analysis of production constraints facing Fadama vegetable farmers in Oyo State, Nigeria. *World Journal of Agricultural Sciences,* 7 (2):189-192.
3. Agbugba, I. K., Nweze, N. J., Achike, A. I. & Obi, A. (2013). Market structure, conduct, channel & margin of dry season okra vegetable in South-Eastern Nigeria. *International Proceedings of Chemical, Biological and Environmental Engineering, Singapore,* 55(14):73-78.
4. Arene, C. J. (2003). *Introduction to agricultural marketing and policy.* Enugu Fulladu Publishing Company.
5. Arene, C. J. (2016). *Economic analysis of agricultural and rural development project: planning, appriasal, implementation, and evaluation,* (2nd). Nsukka: University of Nigeria press Ltd.
6. Arua, R. N., Ezenwanne, O. C., Ibe, J. C. & Umaru, I. I. (2020). Determinants of vegetable consumption among household in Onitsha, Anambra State, Nigeria. *Journal of Agripreneurship and Sustainable Development,* 3(4): 119-128.
7. Asogwa, B. C. & Okwoche, V. (2012). Marketing of agricultural produce among rural farm households in Nigeria: The case of sorghum marketing in Benue State, Nigeria. *International Journal of Business and Social Science,* 3(2):26-34.
8. Bakari, U. M. & Usman, J. (2013). Marketing of some selected vegetables: In Yola- North and South Local Government Areas of Adamawa State, Nigeria. *The International Journal of Engineering and Science*, 2(11): 13-17.
9. Balogun, O. I., Bello, T. A. & Afodu, O. J. (2015). Determinants of farm productivity among fluted pumpkin farmers in Ikenne Local Government Area, Ogun State, Nigeria. *Ethiopian Journal of Environmental Studies and Management,* 8(2): 152-160.
10. Bulama, Y. M., Sule, B. A., & Hammanjoda, A. M. (2020). Economic analysis of wholesale vegetable marketing in Abuja Municipal Area Council, Abuja, Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences,* 6(2): 28-35.
11. Egbeadumah, M. O., Djomo, R. & Ewung, B. (2016). Structure, conduct and performance of tomato retailers in Abeokuta South, Ogun State, Nigeria, *International Journal of Research Studies in Agricultural Sciences,* 2(4):33-39.
12. Girei, A. A., Haruna, U. & Osazuwa, V. N. (2017). Analysis of profitability of pumpkin (Cucurbita spp.) production in central agricultural zone of Nasarawa State, Nigeria. *Asian Research Journal of Agriculture,* 3(1): 1-9.
13. Haruna, I., Nkegba, P. K. & Ustarz, Y. (2012). Structure, conduct and performance of tomato marketing in Ghana. *Journal of Economics and Sustainable Development,* 3(10)
14. Ibeawuchi, I. I., Okoli, N. A., Alagba, R. A., Ofor, M. O., Emma-Okafor, L. C., Peter-Onoh, C. A. & 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):194-208.
15. Ibrahim, U. S., Tahir, A. D., Abdullahi, B. D. and Abdu, A. (2020) Socio-economic factors influencing marketing efficiency of fresh tomato marketers in Yankaba Market of Nassarawa Local Government Area, Kano State, Nigeria. *Journal of Agriculture Economics, Environment and Social Sciences,* 6(2): 71-80.

16. Ikechi, K. A. & Ayman, S. (2018). Marketing analysis of selected vegetables in Port Harcourt Metropolis, Rivers State, Nigeria. *Journal of Agriculture and Veterinary Science,* 11(2): 26-34.
17. Isitor, S. U., Otunaiya, A. O. & Iyanda, J .O. (2016). Efficiency of vegetable marketing in Peri-Urban Areas of Ogun State, Nigeria. *Journal of Agricultural Science*, 8(3).
18. Joyce, C. M., Titus, J., Saminu, Y. M. & Daniel, J. (2020). Analysis of fresh tomato retail marketing in Mubi Metropolitan Area, Adamawa State, Nigeria. *International Journal of Scientific Research and Engineering Development.* 3:499-507.
19. Joseph, K. R., Eric, K. B. & Newton, N. (2018). Empirical analysis of structure and conduct of tomato marketing in Loitoktok, Kajiado Country, Kenya. *International Journal of Agricultural Extension and Rural Development*, 6(4):628-638.
20. Kohls, R. L. & Uhl, J. N. (1998). *Marketing of Agricultural Products*, (8th ed). New York: Macmillan Publishing Company. New York, pp 8-60.
21. Kotler, P . & Keller, K. (2012). *Marketing management* (14th ed). New Jersey, United State of America: Pearson Prentice Hall.
22. Kumar, S. (2014). Marketing efficiency analysis: A case of broiler marketing in Anand district of Gujarat. *International Journal of Commercial and Business Management,* 7(1): 186-190.
23. NPC (2006). National Population Commission, Census Estimate for Nigeria Abuja.
24. Ndaghu, A. A., Taru, V. B. & Isah, J. A. (2010). Structure and conduct of vegetable marketing in Kwadom Yalmatu, Deba Local Government Area of Gombe, Nigeria. *Global Journal of Agricultural Sciences,* 10(1):71-75.
25. Ohen, S. B., Umeze, G. E. & Cobham, M. E. (2014). Determinants of market participation by cucumber farmers in Odukpani Local Government Area, Cross River State, Nigeria. *Journal of Economics and Sustainable Development*, 5(2):188-196.
26. Okonkwo-Emegha, K., Obiekwe, N. J., Agu-Aguyi, F. N., Okafor, I. P. & Umebali, E. E. (2020). Determinants of profitability of organic farming technologies among vegetable farmers: Evidence from South-South Zone, Nigeria. *American-Eurasian Journal of Agriculture & Environmental Science,* 20(1): 51-55.
27. Okunlola, I. A. (2009). Factors associated with fadama production of vegetables by small-scale farmers in Ondo State, Nigeria. *Journal of Food, Agriculture and Environment, 7(3&4)*:551-555.
28. Oladejo, J. A. & Oladiran, J. O. (2014). Marketing analysis and consumption pattern of tomato in oyo State, Nigeria. *International Journal of Agriculture Innovation and Research* 2:811-817.
29. Olukosi, J. O. & Isitor, S. U. (1990). *Introduction to Agricultural Marketing and Prices: Principle and Applications.* Living Books Series, G.U. Publications, Abuja, Nigeria. pp 37-48.
30. Olukosi, J. O., Isitor, S. U. & Ode, M. O. (2005). *Introduction to Agricultural Marketing and Prices: Principle and Applications*. Living Books Series, G.U. Publications, Abuja, Nigeria. 121-126.
31. Osondu, C. K., Nwadike, F. C., Ijoma, J. C., Udah, S. & Ugboaja, C. (2014). Marketing performance on salad vegetables: The case of cabbage marketing in Abia State, Nigeria. *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems*, 4(3):151-162.
32. Ridwan, M. D., Angela, E. O., Festus, E. D., Chinedum, J. C. & Anthony, O. U. (2021). Marketing analysis of vegetables: the case of carrot and cucumber marketing in Enugu State, Nigeria. *Turkish Journal of Agriculture-Food Science and Technology,* 9(2): 346-351.
33. Reuben, J. & Mshelia, S. I. (2011). Structural analysis of yam markets in southern part of Taraba State, Nigeria. *Journal of Agricultural Science*, 2(1): 39-44.
34. Taraba Agricultural Development Programme [TADP], (2016). *Crop Production Recommendation for Taraba State.* Taraba Press Limited, pp31-39.
35. Taye, S. M., Olufemi, A. D. & Fapetu, O. (2013). Marketing performance and efficiency of evaporative-preservation cooling system for fresh tomato marketing in Ondo State, Nigeria. *African Journal of Agricultural Research,* 8(5):468-474.
36. Thompson, D. E. & Agbugba, I. K. (2013). Marketing of tropical vegetable in Aba area of Abia State, Nigeria. *Journal of Agricultural Economics and Development,* 2 (7):272-279.
37. World Health Organization, (2003). Diet, Nutrition and the Prevention of Chronic Diseases. Report of

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue X October 2023

a Joint FAO/WHO Expert Consultation, WHO Technical Report Series #916, Available online at: *www.medicinenet.com/script/main/art.asp.*

38. Umar, S. U. & Abdu, M.Y. (2017). Profitability analysis of fresh tomato retail marketing in some major markets of Kano State, Nigeria. *International Journal of Research in Science*, 3(4):13-16.