Assessing the Marketing Channels of Sweet Melon and Watermelon in Bauchi and Gombe States, Nigeria

[1]Mohammed, S.Y*., [1]Onwuaroh, A.S., [1]Panwal, E.F., [1]Iroegbute, U.K.

[1]Department of Agricultural Economics and Extension,
Faculty of Agriculture,
Federal University Kashere,
Gombe State.

Email: suleiyidi@gmail.com

Abstract

The study Assessed the Marketing of Sweet Melon and Watermelon in Bauchi and Gombe States, Nigeria. Multi-stage sampling technique was employed in the selection process which gave rise to 335 sweet melon and water melon marketers; 172 marketers were randomly selected from Bauchi State and 163 from Gombe State. Data were collected using structured questionnaires and analysed using descriptive statistics which include frequency counts and percentages. The result revealed that sweet melon and watermelon marketing operators were dominated by the retail marketers who constituted up to 81.67% of the respondents. About 76% of the marketers had access to free flow of information, sourced through the use of mobile communications (GSM) and about 52% sourced information through meetings with other marketers within the market. The producers, rural assemblers, wholesalers and retailers were found to be the major actors in the marketing channel of sweet melon and water melon in the area. Inconsistence and poor prices, poor transportation facilities and perishability of the products constituted the major problems to sweet melon and water melon marketing in the study area. The study recommended that stakeholders in watermelon marketing should assist and encourage one another in providing better storage facilities as this will help reduce loss. Also, non-governmental organizations (NGOs) and rich individuals *should help in improving the bad road conditions which has over the years slowed down the transmission speed of perishable goods.*

Keyword: Melon, Producers, Rural Assemblers, Wholesalers, Retailers and Perishability

INTRODUCTION

Fruit vegetables are mostly cultivated in tropical countries and are important for both human and livestock consumption as they contain all the body nutritional requirements for a living. They provide essential nutrients that prevent human health problems like cancer, stroke, high blood pressure, heart attack and other cardiovascular diseases (Bertoia *et al.,* 2015). Sweet melon and watermelon can be eaten raw, fresh, sliced into bits for their sweet and juicy pulp and this juicy pulp could be mixed with sugar, water or milk. Nutritionally, these fruits supply the body with low calories, lycopene which prevent cancer and other diseases, vitamin A, vitamin C , proteins, carbohydrates, fibre, potassium, calcium, iron, fats and

water which all are necessary for good health and development for both human and livestock needs (Onyemauwa, 2010).

Sweet melon *(Cucumis melo* L.) is a warm, long season crop adaptable to all climatic zones. Mature fruits of sweet melon cultivars are usually consumed fresh for the sweet and juicy pulp. The pulp is also mixed with water and sugar, or with milk, and sometimes served as refreshing drink or made into ice cream. Immature fruits of non- sweet types, including snake, are used as a fresh, cooked, or pickled vegetable and are also stuffed with meat, rice and spices or fried in oil (Adamu, 2015). The fresh produce of the world production represents 9% international trade, 30% industrial and the remaining 61% covers the domestic markets (Irtwange, 2006).

Water melon (*Citrullus lanatus*) is consumed throughout the world and is mainly cultivated in the tropical countries. Water melon is good for human consumption and livestock needs as it contains most of the basic daily nutritional requirements of the body. Watermelon is referred to as to "the chief of the world's luxuries and king over all fruit of the earth" (Adamu *et al.,* 2015).

Production and marketing of sweet melon and watermelon have over the years been met with lots of challenges. Insect pests attack, fruits-cracking, fruits rotting, diseases, lack of credit facilities, high cost of inputs and marketing problems among others are major problems facing the production of watermelon in Nigeria (Chamo *et al.*, 2016).
 Given the increasing popularity and importance of sweet melon and watermelon as dessert in many homes in Nigeria, it is imperative to identify the marketing channels and problems encountered in the marketing process. This will help marketing operators and policy makers in proffering solutions and workable policies that could positively transform sweet melon and watermelon production and marketing in Nigeria. Also, not so much work has been done to assess the marketing of watermelon in north-eastern region of Nigeria. This research was initiated to fill the gap by providing information on the marketing operators and price information sources of watermelon among marketers in the region. The flow of information about prices in marketing is very crucial as it guides producers, marketers and consumers in making effective marketing decisions as traders need to know the prices at which to buy and sell and consumers need to know prices of goods and services they might buy for their consumption. Findings from this study will add to existing literatures on sweet melon and watermelon marketing in Northeastern Nigeria.

The broad objective of the study was to assess the marketing channels of sweet melon and watermelon in Bauchi and Gombe States, Nigeria. The specific objectives were to: identify the marketing operators involved; examine the sources of price intelligence; identify the marketing channels for sweet melon and watermelon, and acertain the constraints associated with sweet melon and watermelon marketing in the study area.

METHODOLOGY

The Study Area
The study was carried out in Bauchi State which lies between Latitudes 10^0 17' and 11^0 00'N and Longitudes 9^0 45' E and $11^012'$E. The state has a land area of 49,119 km² and from 2006 population of 4,676,465, the projected population of the state is 6,410,872 (given a growth rate of 3.6%) (NPC, 2006). The climate condition of the state is characterized by the dry and rainy seasons. The rainy season begins from May and ends in September, and the dry season starts in October and lasts up to April with the mean annual rainfall ranges from 600mm to

1300mm. The temperature ranges from a minimum of 18.5^0C to a maximum of 32^0C, with April being the hottest and January the coldest month (Bauchi State Agricultural Development Projects (BSADP), 2009). Predominant ethnic groups in the state are Hausa, Fulani, Kanuri, Gerawa, Sayawa, Jarawa, Bolawa, Kare –Kare and Warjawa (Eniolorunda, 2016).

Gombe State lies between Latitudes 10^0 16' and 11^0 00'N and Longitudes $11^0$00'E and $11^0$11'E. The state has a land area of 20,265 km² and from 2006 population of 2,365,040 , the projected population of the state is 3,647,459 (given a growth rate of 4.05%) (NPC, 2006). The climate condition of the state is characterized by the dry and rainy seasons. The rainy season begins from April and ends in October, and the dry season starts in November and last up to March. The mean annual rainfall ranges from 600mm to 1200mm and the state has a minimum and maximum temperatures of 22.7^0C and 33.5^0C respectively (Gombe State Economic Empowerment and Development Strategy (GOSEEDS), 2010). The inhabitants are predominantly farmers but they are also involved in trading and other skilled works such as blacksmithing and carpentry (Eniolorunda, 2016). The major agricultural crops grown in the states are sorghum, millet, maize, groundnut, cowpea, soybeans, onion, acha and pepper. Others include tomato, sugarcane, and sweet potato and melon (both watermelon and sweet melon) (Eniolorunda, 2016).

Sampling Procedure and Sample Size

A multi-stage sampling procedure was used in selecting the sampled population for this study. Stage one involved the purposive selection of 3 main Local Government Areas (LGAs) each from Bauchi and Gombe States, making a total of 6 LGAs. The LGAs were selected based on high population and large markets for sweet melon and watermelon. The second stage involved purposive selection of 3 major markets from each LGA, making 18 markets and the last stage involved simple random selection of respondents from these markets. Sample size to be drawn from each village was determined using the Yamane sample size determination formula which was earlier used by Onwuaroh et al. (2017) In all, 335 sweet melon and water melon marketers were randomly selected from a sample frame of 2056 collected from the selected markets of the study area. Out of the 335 questionnaires administered, only 300 were successfully filled and returned back, therefore the study worked with data from 300 marketers.

Table 1: Sample Size Distribution

State	LGAs	Number of Selected Markets	Sample Frame	Sample Size
Bauchi	Kirfi	3	321	52
	Bauchi	3	440	72
	Misau	3	297	48
Gombe	Balanga	3	247	40
	Gombe	3	335	55
	Yamaltu-Deba	3	416	68
Total	**6**	**18**	**2056**	**335**

Source: Field survey, 2016-2017

Method of Data Collection

The data for this research were collected from wholesale and retail sweet melon and water melon marketers using structured questionnaires.

Data Analysis
The analytical tool used in this study was descriptive statistics which include frequency count, tables and percentage.

RESULTS AND DISCUSSION

Sweet Melon and Watermelon Marketing Operators
Table 2 shows the major operators in sweet melon and watermelon. Knowing who the major operators are will enable policy makers and other interest groups to know who best to contact when dealing with price control of the market.   The result from Table 2 revealed that sweet melon and watermelon marketing was dominated by retailed marketers which constituted up to 81.67% of the respondents, whereas, the remaining 55 respondents were shared between wholesalers and the rural assemblers with 14.67% and 3.67% respectively, this indicated that sweet melon and water melon markets were mainly dominated by the retailers hence, may likely have power on price in the market. The result is in line with the findings of Mohammed *et al*. (2014); FAO (2013); Haruna *et al*. (2012) and Olukosi and Isitor (2005), who reported that marketing of sweet melon and watermelon were dominated by retailers. However, this was contradicted by Isibor and Ugwumba (2014) on their study which showed that watermelon marketing in Nnewi metropolis was controlled by men at the wholesale level and women at the retail level.

Table 2: Distribution of Sweet melon and Watermelon Marketers According to Market Operators

Market Operators	Frequency	Percentage
Rural Assemblers	11	3.66
Wholesalers	44	14.67
Retailers	245	81.67
Total	**300**	**100.00**

Source: Field survey, 2016-2017

Market Intelligence for Sweet Melon and Watermelon Marketers
As shown in Table 3, about 52% of the respondents sourced prices information through organising meeting with other marketers within the markets with only 0% in other markets (markets outside the study market). The result also revealed that 27.30% of marketers sourced price informations through markets survey within the markets with 10.70% of the respondents in other markets. Information on prices from other markets were obtained through the use of mobile communications (GSM) which constituted 76.30% of the respondents with only 4.70% of them within the markets. Marketers that do not receive any information about price either within or outside the markets constituted about 49% and 13% respectively. This showed that the sweet melon and watermelon marketers obtained free flow of information through meetings with other marketers within the markets in order to fix a price or a range at which they sold their commodity, while for other markets they used GSM calls and asked about the price to enable them fix theirs. This is because most decisions on pricing depend on the accurate information available; hence reduce the problems of keeping the commodity for longer periods to avoid loses as a result of perishability of the products. This is in line with the findings of Abdullahi (2015), Benjamin and Victoria (2012) as well as Damisa (2007) who separately reported that marketers gathered price information through meeting with other marketers, while Haruna (2011) and Abdu (2006) revealed that marketers obtained information on prices through the use of GSM.

Table 3: Distributions of Sweet melon and Water melon Marketers According to Sources of Information

Information	Within the market		In other market (markets outside the study market)	
Sources	Frequency	Percentage	Frequency	Percentage
Meeting	155	51.70	0	0.00
Market surveys	82	27.30	32	10.70
GSM call	14	4.70	229	76.30
Not Available	49	16.30	39	13.00
Total	**300**	**100.00**	**300**	**100.00**

Source: Field survey, 2016-2017

Sweet Melon and Watermelon Marketing Channels
Fig 1 showed the marketing channels for sweet melon and watermelon. The major participants identified in the channelling of sweet melon and watermelon in the study area include the producers, rural assemblers; wholesalers; urban wholesalers (brokers), market retailers, mobile retailers and the final consumers. The result further showed that three channels were found to be more active and functional and therefore regarded as the major channels; these include the producer channel, wholesale channel and retail channel. Each stage in the channel has value added and the value addition incurs extra cost which is reflected in the final price of the sweet melon and watermelon.

The result further revealed that wholesalers sell to urban wholesalers (brokers) as well as to market and mobile retailers who at the end sell to final consumers. Even though many linkages can be drawn with respect to sweet melon and watermelon marketing, those presented in Fig 1 are the major channels through which sweet melon and watermelon move from the producers to the ultimate consumers. The perishable nature of sweet melon and watermelon may probably restrict the total number of its intermediaries or participants along the value chain. All the marketing channels shown in this study are important and do have vital roles they play but the major three channels identified are most important because they hold commodity for longer period of time when compared with other channels. This result is in line with the findings of Agbugba (2003) whose study on Economics of Vegetable Production and Marketing in Aba Area, Abia State showed producer, wholesale and retail channels to be the major channels in marketing of fruits and vegetables. Also, the work of Isitor *et al*. (2016) which showed producers, wholsalers and retailers to be the major marketing channels for vegetables corroborates the finding of this work. The aforementioned authors opined that shorter market channels help to minimize losses due to rot and also maintain the nutritive quality of the produce .
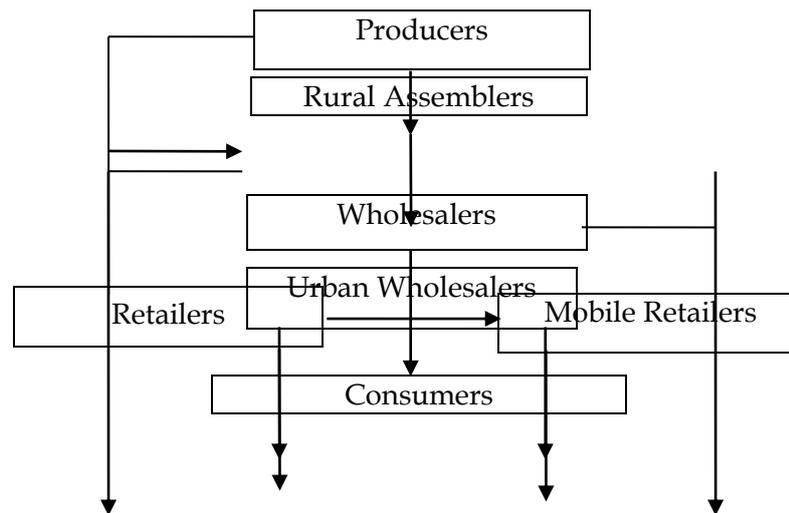
Figure 1*: Sweet melon and Water melon Marketing Channels in Bauchi and Gombe States, Nigeria.*
Source: Field survey, 2016-2017

Constraints to Sweet Melon Marketing
The problems associated with Sweet melon marketing in the study area were presented in Table 4. These problems include inconsistence and poor prices; inadequate storage facilities; inadequate processing facilities; poor transportation facilities and perishability of the products

1. Inconsistence and Poor Prices: The inconsistence and poor price of the products which is ranked 1st with a mean score of 2.31 was found to be the major problem associated with the marketing of sweet melon. The perishable nature of the product in most cases has forced the marketers to offer their products to buyers at low prices to avoid damage due to rot. Marketers who encounter heavy losses due to rot sometimes may avoid marketing the product in subsequent years to recover from their losses and this reduces the market competition, thereby increasing the price of sweet melon and watermelon. The high prices further attract more marketers which make the market more competitive, thereby resulting in price drop. The price fluctuation of the product is a major challenge to both marketers and producers.   This is in line with the findings of Yohanna (2006) that commodity price fluctuation (ranked 3rd.) was found to be among the constraints affecting the marketing of Orange in Bauchi metropolis, Bauchi State of Nigeria.

2. Inadequate Storage Facilities: Due to the bulky and perishable nature of sweet melon, their handling and storage tend to be difficult as a result of poor storage facilities. The result indicated that inadequate storage was a challenge facing marketer; it was ranked 7th with the mean score of 1.82. This implies that the respondents incurred considerable losses of their produce which invariably reduced their income in the business. The finding agrees with the works of Taphee *et al*. (2015); Adamu *et al*. (2011); Sajo (2015) and Mohammed *et al*. (2012) who reported inadequate storage facilities among the most severe problems which ranked 2nd in okra marketing, 3rd in watermelon marketing, 3rd in onion marketin and 4th in orange marketing respectively.

3. Inadequate Processing Facilities: Most fruits and vegetable marketing in Nigeria are faced with inadequate processing and preservation facilities. Food processing plants are virtually limited or even none in existence, with the exception of few flour mills in Sokoto

and oil mills in Gusau (Mohammed, 2010). As shown in Table 4, sweet melon marketers with the challenge of inadequate processing facilities ranked 8th with the mean score of 1.77. Thus, absence of good and affordable processing facilities may result to prompt selling of the commodity at any given price and time in order to reduce these losses due to perishable and bulky nature of the products. This is in line with studies of Adamu *et al.* (2015), Mohammed *et al.* (2014), Sajo (2015) that fruits and vegetables marketers in their study areas recorded problem of inadequate processing facilities as a major constraint affecting their respondents and were found to be ranked 1st,3rd and 4th respectively.

Table 4: Constraints to Sweet Melon Marketing in Gombe and Bauchi States

	Constraint levels						
	Very serious	Serious	Not serious	Total	Mean scored	SD	Rank Order
Constraints	1	2	3				
Inconsistence and poor prices	20	166	114	694	2.31	0.59	1st
Inadequate storage facilities	84	185	31	547	1.82	0.59	4th
Inadequate processing facilities	118	132	50	532	1.77	0.71	5th
Poor transportation facilities	40	186	74	634	2.11	0.61	2nd
Perishability of the products	74	186	40	566	1.89	0.61	3rd

Source: Field survey 2016-2017
Note: Multiple response were recorded
SD= Standard deviation

4. Poor Transportation Facilities

An efficient transport system is critically important to an efficient agricultural produce marketing. If transport facilities or services are of poor quality or extensive, then marketers will be at a disadvantage when attempt to sell their produce. This may lead to increase in the marketers' cost of transport which invariably increase his marketing cost and this increase will lower his total revenue and net profit at the end. Poor transport facilities such as impassable roads or slow and poor transport services can lead to produce loses as a result of perishable and bulky nature of Sweet melon especially if the commodity is going to be transported to distance place. Table 4 indicated that majority of the respondents faced the problem of poor transportation facilities (ranked 3rd) and recorded the mean score of 2.11. The result is also similar to the studies of Adamu *et al.* (2015); Taphee *et al.* (2015), Sajo (2015); Mohammed *et al.* (2014); and Yohanna (2006), who all reported that Fruits and Vegetables marketers identified lack of good transportation facilities as part of the major problems faced by their respondents.

5. Perishability of the Products:

The bulky and perishable nature of agricultural produce especially fruits and vegetables such as sweet melon and watermelon make its marketers not to handle the commodity for longer period of time. This may be attributed to poor transportation services, lack of good storage and preservation facilities in our marketing system, hence this compelled the marketers to dispose the commodity at any given price in order to reduce the loses as a result of produce spoilage when kept for long periods. The result in Table 4, indicated that perishability of produce is one of the factors affecting the smooth marketing and distribution of sweet melon in the study area. The problem was found to rank the 6th with a mean score of 1.89 as recorded. This agrees with the findings of Taphee *et al.* (2015); Adamu *et al.* (2011); Sajo (2015); Mohammed *et al.* (2014); and Yohanna (2006) who separately reported the perishability problem was among the most serious

problems affecting the marketing of fruits and vegetables in their study areas. The result is contrary to the work of Adamu *et al.* (2015) who did not report it as part of the respondents' problems.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the result indicated that there was free flow of information, which is mainly sourced through meetings and use of mobile communications (GSM). The market was mainly dominated by retailers; this implies that price control was majorly in their hands. The producers, wholesalers and retailers were the major marketing channels of sweet melon and watermelon in the area; a shorter channel reduces the losses encountered before reaching the consumers. Inconsistence and poor prices; poor transportation facilities and perishability of the products constituted the major problems to sweet melon and watermelon marketing in the study area. The study recommended that stakeholders in watermelon marketing should assist and encourage one another in providing better storage facilities as this will help reduce loss incurred; such assistance could come in the form of loans, grants, trainings etc. Also, the non-governmental organizations (NGOs) and rich individuals should help in improving the bad road conditions which has over the years slowed down the speed of transporting perishable goods.

REFERENCES

Abdullahi, S. (2015).Comparative Economic Analysis of Small-Scale Groundnut Oil Processing of *Maiborgo* and *Yardakar* Varieties in Gombe Metropolis, Gombe State, Nigeria. Unpublished M.Sc. Thesis submitted to the Department of Agricultural Economics, Abubakar Tafawa Balewa University of Technology Bauchi, Bauchi State, Nigeria. 131pp.

Adamu, Y. (2015). Comparative Analysis of the Water Melon and Sweet Melon Production Among Farmers in Gombe and Bauchi States, Nigeria. Unpublished Ph.D. Thesis submitted to the Department of Agricultural Economics, Modibbo Adama University of Technology Yola, Adamawa State, Nigeria. 139pp.

Adamu Y; Babawuro A. and Kubura H. (2011). Profitability of Water melon Production and Marketing in Kirfi Local Government Area of Bauchi State, Nigeria. Proceedings of 25th Annual National Conference of FAMAN heald at Federal College of Agriculture Akure, Ondo State, Nigeria. Pp. 231-236.

Adamu, Y., Mohammed, S.Y. and Hamidu, K. (2015). Analysis of Profitability of Sweet Melon marketing in Gombe Metropolis, Gombe State, Nigeria. *Journal of Agricultural Economcs and Social Sciences.* **1**(2): 144-150. Agriculture Akure, Ondo State, Nigeria. Pp 231-236.

Abdu, Z. (2006). Economics of Soyabean marketing in Guinea Savannah Zone, Nigeria. Unpublished Ph.D Thesis, Agricultural Economics and Extension programme, Abubakar Tafawa Balewa University, Bauchi, Nigeria. 1-168pp

Agbugba, I.K (2003). Economics of Vegetable Production and Marketing in Aba Area, Abia State,Unpublished B.Agric. Thesis, Dept. of Agricultural Economics, University of Nigeria, Nsukka

Benjamin, C. A. and Victoria, A.O. (2012). Marketing of Agricultural Produce among Rural Farm Households in Nigeria. The Case of Sorghum Marketing in Benue State, *International Journal of Business and Social Sciences.*3(13)269-277

Bertoia, M.L., Mukamal, K.J., Cahill, L.E., Hou, T., Ludwig, D.S., Mozaffarian, D., Willett, W.C., Hu, F.B. and Rimm, E.B (2015). Changes in Intake of Fruits and Vegetables and

Weight Change in United States Men and Women Followed for Up to 24 Years: Analysis From Three Prospective Cohort Studies. *PLoS medicine*.12(9):e1001878.

Bauchi State Agricultural development Project (BSADP) (2009). Progress and Achievement in Agriculture. Ramadan Press Ltd. 55pp

Chamo, A.M., Sabo, B. B., Karaye, A.K and Rabiu, A.M. (2016). Factors Affecting Watermelon (CitrullusVulgarus) Production among Farmers of Gada Community, Kazaure Local Government Area, Jigawa State. *Global Advanced Research Journal of Agricultural Science* 5(12): 432-439

Damisa, M. A. (2007). Price Information and Market Integration of Grains Markets in Kazaure and Yankwashi Local Government Areas of Jigawa State. *Asian Journal of Marketing,* 1 (1): 23 – 26.

Eniolorunda, P.A. (2016). Factors Influencing Adoption of Recommended Conservation AgriculturalPracticesof Maize Farmers in Bauchi and Gombe States, Nigeria. An Thesis Submitted to The School of Postgraduate Studies Ahmadu Bello University, Zaria, in Partial Fulfillment of the Requirments for the Award of the Degree of Doctor of Philosophy in Agricultural Extension and Rural Sociology (unpublished).

Food and Agriculture Organisation (FAO) (2013). Agricultural and Food Marketing Management: FAO Corporate DocumentRepository, Rome, pp 1 – 31; http://www.fao.org/docrep/004/W3240E/W3240E01.html.

Gombe State Economic Empowerment and Development Strategy (GOSEEDS) (2010). Handbook, Abuja, Dandafid Nig. Ltd, pp 48.

Haruna, D. (2011). Economics of Groundnut Marketing: A Case Study of Bogoro and Tafawa Balewa Local Gorvernment Areas of Bauchi State,Nigeria. Unpublished M.Sc. Thesis submitted to the Department of Agricultural Economics, Abubakar Tafawa Balewa University of Technology Bauchi, Bauchi State, Nigeria. 84pp.

Haruna, U., Sani, M. H., Danwanka, H. A. and Adejo, E. (2012). Economic Analysis of Fresh Tomato Marketers in Bauchi Metropolis of Bauchi state, Nigeria, *Nigerian Journal of Agriculture, Food and Environment.* **8** (3): 1 – 8.

Irtwange, S. V. (2006). "Maturity, Quality and Marketing of Fruits and Vegetables", *International Journal of Agricultural Engineering,* **7** (8).

Isibor, A.C. and Ugwumba, C.O.A. (2014). Analysis of Watermelon (*Citrullus Lunatus*) Marketing in Nnewi Metropolis of Anambra State, Nigeria. *Journal of Sciences and Multidisciplinary Research.* 6, (2) ISSN: 2277-0135, Pp. 1 – 8.

Isitor, S.U., Otunaiya, A.O. and Iyanda J.O. (2016). Efficiency of Vegetable Marketing in Peri-Urban Areas of Ogun State, Nigeria *Journal of Agricultural Science;* 8(3): 142-150

Mohammed, S. Y. (2010). Economic Analysis of Orange Marketing in Gombe metropolis, Gombe State, Nigeria. Unpublished M.Sc. Thesis submitted to the Department of Agricultural Economics, Abubakar Tafawa Balewa University of Technology Bauchi, Bauchi State, Nigeria, 89pp.

Mohammed, S. Y., Haruna, U. and Adamu, Y. (2012). Cost and Returns of Orange Marketing in Gombe Metropolis, Gombe State, Nigeria. *Journal of agricultural Science and Technology Research.* **11**(2): Pp. 141-147.

Mohammed, S.Y.,Salawu, J. A. and Adamu, Y. (2014). Socio-economic Characteristics and Marketing Margin of Orange Marketers in Gombe Metropolis, Gombe State-Nigeria. *Journal of Scientific Research.*, **1**(2): 36-42

N.P.C. (2006). Annual Statistical Abstract on Nigeria Population Census,Abuja, NPC, pp 22. Nnamdi, A. (2000). Research Methodology in the Behavioural Sciences, Lagos, Longman Nigeria Plc, Pp 194.

Olukosi, J. O; Isitor, S. U and Ode, M. O. (2005). Introduction to Agricultural Marketing and Price: Principles and Appliances, Abuja, Living Books Publishers Company, 120pp.

Onwuaroh, A.S., Yusuf, R.O., Yusuf, O. and Akpu, B. (2017). Impact of Insurgency on Income of Farmers in Northeastern Nigeria. *Dutse Journal of Pure and Applied Sciences (DUJOPAS)*, 3 (2): 101-113

Onyemauwa, C. S. (2010) Marketing margin and efficiency of watermelon marketing in Niger Delta Area of Nigeria. *AgriculturaTropica Et Subtropica*, 43:196-201. Osuji, U. S. A., Aiyedun, J. O. and Femi, A. A. (2006). Statistical Methods II, Lagos, Gold Print (SS) Ltd, 181pp.

Sajo, I. A.(2015). Economic Analysis of Onion Marketing in Gombe Local Government Area, Gombe State, Nigeria. MSc. Thesis submitted to the Department of Agricultural Economics, Abubakar Tafawa Balewa University of Technology Bauchi, Bauchi State, Nigeria. (Unpublished) 79pp.

Taphee, B.G., Reuben, J., Mshelia, S.I. and Jongur, A.A.U. (2015). Economic Analysis of Fresh Okro Marketing in Jalingo Metropolis, Taraba State, Nigeria, *American Advanced Journal of Agricultural Sciences 2015*. 1: 1-7.

Yohanna, D. (2006). Profitability Analysis of Mobile Mango and Orange (Vendors) in Bauchi metropolitan Area of Bauchi State, Nigeria.Unpublished Undergraduate Project, submitted to Agricultural Economic and Extension Department, ATBU Bauchi, Nigeria, 39pp.