

**ANALYSIS OF FRESH TOMATO MARKETING IN MUBI METROPOLITAN AREA, ADAMAWA STATE*****Aliyu, A., Shelleng, B.A., Haddab, A.S. and Abubakar, A.**

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Received 20th April 2020; Accepted 25th May 2020; Published online 21st June 2020**Abstract**

The study analyzes fresh tomato marketing in Mubi metropolitan area. Primary data was the main source of data collected with the use of well-constructed questionnaire. Purposive and simple random sampling technique were adopted for the selection of respondents for the study. The analytical tools used include descriptive and inferential statistics such as Gini coefficient and gross margin. The result of the study revealed that majority (49.9%) of the sampled fresh tomato marketers are in their most active age (31 to 40 years) with majority of them were male and were married and had no formal education and could not read or write effectively. 100% of the marketers belong to marketers association. The analysis of the study shows that majority of them engaged in marketing of fresh tomato as full time business and do not have any other business apart from it with few of the respondents were in the business for long period of time and (93.9%) of them obtained their initial capital outlay from their personal saving and this led to their (marketers) inability to operate large-scale business in the study area. The analysis also, indicated channel 2 (producer's- wholesaler's - retailer- consumers) was the major channel of fresh tomato marketing and high inequality among fresh tomato marketers. This is an indication that there is fresh tomato marketers exercising control over the market price. The analysis of costs and returns per basket per day of fresh tomato marketing in the study area revealed that, it was a profitable and economically viable means of earning livelihood despite the constraints being encountered such that inadequate capital (rank 1), lack of storage facilities, seasonality and perish ability (rank 2, 3 and 4) were the major problem affecting fresh tomato marketing in the study area. Therefore, it is concluded that fresh tomato marketing in Mubi metropolitan area of Adamawa state is a profitable venture and economically viable means of earning livelihood with the gross margin of N1, 267, net income of N1, 215 and the gross ratio of 0.88 per basket per day, despite the problems encountered by the marketers and recommended that farmers should be encouraged to form cooperative societies so as to enable them obtain loans from commercial banks and agricultural and rural cooperative bank, at regulated interest rates.

Keywords: Fresh, Tomato, Marketing, Mubi, Adamawa State.**INTRODUCTION****Background of the study**

Agricultural marketing is one of the important branches of marketing that deals with the exchange of agricultural goods. Agricultural marketing starts when the crop is harvested. But the concept has been changed, as it is a process, which starts with the farmer's decision to produce saleable farm commodities involving all aspects of marketing structure or system both financial and institutional with economic considerations including products assembly, preparation for the market, distribution and use by the final consumer (Kaini and Werner, 1998). It comprises of all the activities from production to consumption such as harvesting, grading, packaging, storing, price fixation, selling and buying. Agricultural marketing deals with all the activities, agencies and policies involved in the procurement of farm inputs by the farmers and movement of agricultural products from the farm gate to the marketers (Kiruthiga *et al.*, 2015). Tomato (*Lycopersicon esculentum*) is one of the most important vegetables which supplies vitamins, minerals and fibres to its consumers and is of high nutritional values. It is widely accepted and commonly used in a variety of dishes as raw, cooked or processed products more than any other vegetable (Adugna, 2009). Tomato fruit provides 3 - 4% total sugar, 15 - 30mg/100g ascorbic acid; 7.5 - 10 mg/100ml treatable acidity and 20-50mg/100g fruit weight of lycopene - antioxidants for

cancer prevention especially those of the prostate gland, lungs and stomach. However, unlike cereals, the marketing of horticultural crops, in general; and vegetables and fruits in particular, is more complex and risky because of their perishability, seasonality and bulkiness nature thus, needs special care. As a result, the supply of vegetables is subjected to various problems including wide fluctuation in prices (Adenegan and Adeoye, 2011). Tomato is cultivated almost throughout Nigeria (Adenegan and Adeoye, 2011); cultivation on a large area can generate employment both at the urban and rural levels. In actual fact, in 2016, Nigeria is ranked as the second largest tomato producer in Africa and thirteenth in the world with an estimated total annual production of 1.7 million tones cultivated on 1 million hectares of land and an average yield of 20 - 30 tons/hectare (YISA, 2017). Yet Nigeria is the largest importer of tomato despite the fact that tomato production is a viable option to increase farm income and hence alleviate widespread poverty, considerable attention has not been given to its marketing aspects; because of the imbalance in distribution system and lack of organized marketing system, there is always a market glut of tomato in main production season and scarcity of the commodity in other seasons (Adenegan and Adeoye, 2011). There are many varieties within the two main types and this can often confuse a beginner tomato grower (Sacco 2008). Sacco describes these two main types of tomatoes as the hybrid and the open pollinated. Other authors however, describe what Sacco refers to as types, groups. Hybrid tomatoes are a cross between two different tomatoes often with a positive and negative aspect (Sacco 2007). The positive aspect is the fact that they carry desired traits of either parent such as size of fruit, resistance to

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some disease and even odour. On the negative front, their seeds could revert to wither of the parent plant or would become sterile and will not produce seeds at all. According to Sacco (2008), there are more tomato varieties sold worldwide than other vegetables. Gould (1992) reported that although not specifically documented, early tomatoes were probably small fruited, since they were most likely of the small fruited caesiforme variety cultivated by the Aztecs. Additionally, later emphasis on breeding for smooth skinned cultivars suggest that early cultivars initially had rough skin. Open pollination promotes continual small changes in the plant's production and immunities (Edlin, 2009). This therefore meant that through open pollination, new varieties are obtained over a period and if are isolated from other varieties to prevent further out crossing, this new variety becomes an heirloom. Heirloom tomatoes, as described by the Market Corner Newsletter (2005), are open-pollinated plants, grown directly from the seed of a previously fruit, from a history of folklore of its own (Vivrina *et al.*, 2003) and (Watson, 1996). No matter which definition one choose to go by, there is one major quality that all heirlooms must share, open pollination (Edlin, 2009). Domesticated tomatoes (*Solanum Iyeopersicum*) are naturally self-pollinating. Since they do not outcross very often, strains quickly become homogenous and produce "true to seed" (Edlin, 2009). Colors of heirlooms range from yellow, red, orange, purple, white, green, and bicolor combination of them all. There is also wide variety in their shapes and sizes. One can find tiny cherries and huge two-pounders in the same garden, along with globe, flattened, oblong pumpkin, egg, pear, and pepper shaped fruits.

Statement of the Problem

Tomatoes marketing begin at the farm gate (Haruna *et al.*, 2012). They are transported from the farm to the nearest assembly market for the consumers or wholesalers who assemble them to a big city market and sell to other wholesalers, retailers or consumers. Tomato marketing is poorly developed in Nigeria. Worst still, in the past, the government paid more attention to production with little attention to the marketing of vegetables such as tomato, pepper, onions, garden eggs, okra and leafy vegetables despite the fact that they need marketing facilities (Idachaba, 2000).

The unique characteristics of agricultural products including tomatoes pose some problems both to the farmers, marketers and final consumers. Its seasonality, bulkiness and perishability exert pressure on handling, packaging, transportation and sales with an attendant effect on the market price. Consequently, losses of 40-50 percent occur for many vegetables mainly due to spoilage, inadequate transportation, sorting, improper packaging and handling and lack of storage facilities. Also, another problem with tomato marketing is in the area of standard weights and measurements. These leave the consumer to their luck and haggling abilities in securing a good deal. This waste coupled with unpredictable prices accentuates variability in farm income which discourages small scale farmers from growing tomatoes for marketing which result to low productivity and high prices of both fresh and processed tomato products. The marketing of vegetable crops, in general, and tomato in particular, has been generally acknowledged. But, little research has been directed towards the economic analysis of tomato marketing especially in Mubi metropolitan area. Therefore, it is interesting to study the economics analysis of tomato marketing in Mubi metropolitan

area. In view of the above, the study will address the following research question below:

- i. What are the socio-economic characteristics of fresh tomato marketers in the study area?
- ii. What are the existing marketing channels of fresh tomato in the study area?
- iii. How is the structure of fresh tomato marketing in the study area?
- iv. What is the marketing margin of fresh tomato in the study area?
- v. What are the problems affecting fresh tomato marketing in the study area?

Objectives of the Study

The main objective of this study will be to analyze fresh tomato marketing in Mubi metropolitan area, while the specific objectives of the study are to:

- i. Describe the socio-economic characteristics of fresh tomato marketers in Mubi metropolitan area;
- ii. Identify existing marketing channels of fresh tomato in Mubi metropolitan area;
- iii. Examine the structure of fresh tomato marketing in the study area;
- iv. Determine the profitability of fresh tomato marketers in Mubi metropolitan area;
- v. Identify the problems affecting fresh tomato marketers in Mubi metropolitan area.

Scope and Limitation of the Study

The study focuses on the economic analysis of fresh tomato marketing. The study will be limited to Mubi metropolitan area in Adamawa State because of their relative importance in fresh tomato marketing. The study will also be limited to the socio-economic characteristics of fresh tomato marketers, marketing channels of fresh tomato, structure of fresh tomato marketing, profitability of fresh tomato marketing, and the problems associated with fresh tomato marketing in Mubi metropolitan area. This research would have gone beyond this scope but because of some limitations it could not. One of the limitations is financial constraint. Therefore, more could not be gotten and inadequate time resources. Another constraint will be the inability of the respondents to correctly respond to the question in the questionnaire very well however, this will minimize through interview to select the respond and fill the question clearly. For the case of time, the study will be conducted during time of their sales and school session, lack of proper attention will be envisaged. Due to the mentioned constraint the study will be conducted in Mubi metropolitan area.

Significance of the Study

The study can be used to suggest strategies for smooth integration among production and marketing by referring to root causes for supply and marketing problems starting from production till the consumption of the product. The study will serve as reference for researchers to embark upon similar or related work in other parts of the country as it generates new information about fresh tomato marketing on the study area and the study include input price and output price, drought and diseases as determinant of fresh tomato supply for that particular area which are not incorporated by other studies. The

other benefit that were anticipated is that its significance as a source material for further studies, which could be a major input to formulate appropriate marketing policies. In addition to this fresh tomato price currently increase more than previous time so study on marketing of fresh tomato today is important to identify whether producers gets the right share or not. Finally, it will also be of relevant in the academics for teaching and research purposes as well as addition to the existing body of knowledge and volume of literature on fresh tomato marketing that would promote greater awareness on marketing of fresh tomato marketing survey.

LITERATURE REVIEW

Tomato as a Food for Human Consumption

According to Kybal (1993), the tomato was not eaten until the nineteenth century because Mattioli had called it mala insana (unhealthy flower) and scientific textbooks kept insisting it was poisonous. In North America, tomato became common in the early part of the 19th century. As in most of Europe, tomato was considered poisonous until its acceptance around 1840 as a nutritious vegetable (Paran and van der Knaap 2011). This is because when the tomato was first introduced to the Europeans, they considered it poisonous for having qualities similar to other known poisonous plants and was therefore only grown as an ornamental plant. People were reported to have gotten sick from eating it but this, according to Lewis (2007) might have come from their plates they ate from and not from the tomato itself. Plates were made from pewter, a soft metal that often had lead, a very poisonous metal which could be caused to seep out by the acid in tomatoes. However, Barceloux (2008) and (2009) wrote that like many other plants in the nightshade family, tomato leaves and stems contain atropine and other alkaloids including the tomatine that can be quite toxic if ingested. Paran and van der Knapp (2007) believe that the Italians were probably the first group of Europeans to eat the tomato. This claim is from a written record by Mattioli where he is said to have described human consumption of tomatoes with oil and salt, suggesting that tomato was already established in the Italian cuisine by the early 16th century this contradicts Kybal (1993) who reported Mattioli to have described the tomato as poisonous. Tomatoes, aside from being tasty, are very healthy as they are a good source of vitamins A and C. Vitamin A is important for bone growth, cell division and differentiation, for helping in the regulation of immune system and maintaining surface linings of eyes, respiratory, urinary and intestinal tracts (Egbeadumah, 2008). Vitamin C is important in forming collagen, a protein that gives structures to bones, cartilage, muscle and blood vessels (Egbeadumah, 2008). It also helps maintain capillaries, bones and teeth and aids in the absorption of iron. Lycopene is a very powerful antioxidant which can help prevent the development of many forms of cancer. Cooked tomatoes and tomato products are the best source of lycopene since the lycopene is released from the tomato when cooked. A raw tomato has about 20% of the lycopene content found in cooked tomatoes. However, raw or cooked tomatoes are considered the best source for this antioxidant (Egbeadumah, 2008).

Marketing of Fresh Tomatoes

Marketing of fresh tomato involves several actors among whom are collectors, wholesalers and retailers. Collectors are

operators who ply the area to buy tomato from growers and resell to wholesalers. Wholesalers are those who purchase tomato at bulk prices from collectors. Retailers are those who buy in small quantities either directly at the market from growers or from wholesalers and collectors (Diakité and Kergna, 2002). Six basic marketing alternatives are available to the tomato marketing: wholesale markets, cooperatives, local retailers, roadside stands, pick-your-own operations, and processing firms (Orzolek *et al.*, 2006). Marketing cooperatives generally use a daily-pooled cost and price, which spread price fluctuations over all participating producers. Fresh and processed produce can be marketed on the farm, at the farm gate, locally or regionally via wholesale or retail operations, or through exports to other countries. When deciding how to market your fresh and processed produce, each postharvest handling step taken provides an opportunity to make additional profits (Kitinoja, 2004).

Socio-Economic Characteristics of Fresh Tomato Marketers

Sex: Haruna *et al.* (2012) found out that 88% and 12% of tomato marketers in Bauchi State were males and females, respectively. The implication of this is that most of the respondents were in their active age being able to go about their business with vigour. The very low percentage that accounted for women participation in tomato marketing has to do with religion and culture of the people in the study area, which emphasized more on domestic economic activities of women than outdoor home ventures. Another factor could likely be connected with the tedious nature of the business, in which most women are considered to be weak in handling it than their men counterpart. Egbeadumah *et al.* (2016) describes the socio-economic characteristics of tomato retailers in Abeokuta South which include sex; age; marital status; education, years spent in school; experience; household size and labour type. Analysis of sex of tomato retailers indicated that 98.75% of respondents were female while 1.25% was male. This implies females are predominantly involved into tomato business. In terms of gender, 36 wholesalers (90%) and 40 retailers (100%) were females, and 4 wholesalers (10%) were males. Mainly, marketing of tomato is practiced by women (Diakité and Kergna, 2002). Obayelu *et al.* (2014) in their economics of fresh tomato marketing in Kosofe local government area of Lagos State, they revealed that female marketers (73.7%) dominated the markets. However, males are not being left out in tomato marketing.

Age: According to Egbeadumah *et al.* (2016) in Abeokuta South and Ogun States revealed that the mean age of respondents is 38.7 years implying that majority of tomato retailers are within the economically active age. Specifically, 16.25% of tomato retailers' age range is between 21 to 30 years; 42.5% of respondents' age range is between 31 to 40 years; 33.75% of respondent's age range is between 41 to 50 years and 7.5% of respondent's age range is between 51 to 60 years. Following Ogunyinka (1997) age is an important determinant of an individual's capability to undertake marketing activities. The older a business man or woman is, the lesser he or she can physically perform operation and the more he or she will have to depend on the use of agents or hired labour. Haruna, *et al.* (2012) in their study in Bauchi state of Nigeria revealed that majority (40%) belongs to the active population group of 36-40 years. The findings signified that they are relatively young and active to engage in

marketing. Only 12% of the respondents are less than 25 years old, while 18.00% fell between the age bracket of 40 and above. This also indicated that old people are more engaged in tomato marketing than middle aged in the study area. Shehu and Salman (2017) in their study in Kwara State indicated that majority (70%) of fresh tomato marketers were female with an average age of 39.5 years. Maimouna and Wang (2013) in Mali reported that the respondents' age ranges from 19 to 50 with an average of 29 years. About 17.5% of the traders fall below 24 years. It was observed that 22 wholesalers (55%) and 29 retailers (72.5%) were from 25-35 years old category, 9 wholesalers (22.5%) and 4 retailers (10%) were from 35-45 years old category, and 2 wholesalers (5%) were traders whose age category were higher than 45 years old. Obayelu, *et al.* (2014) reported that majority (56.2%) of the marketers are between the ages of 31-50 years. The marketers mean age of 40.81 years indicates that the tomato marketers are in their economic active years. Sanusi and Dada, (2016) shows the distribution of tomato marketers by socio-economic characteristics in Ogun State Nigeria about 42.5% and 40.0% were within the age group of 31 - 40 years with mean age of 35 and 33 years in Olodo and Kila markets respectively which falls within the economically active working age group. This implies that most of the sampled tomato marketers were relatively young. Sanusi and Dada, (2016) in Olodo and Kila markets, all the respondents were female; this could be attributed to gender role in the society. Women are mostly involved in marketing of agricultural produce in Southwest Nigeria while men are the major producers.

Marital Status

According to Sanusi and Dada, (2016) about 45.0% and 37.5% of the marketers in Olodo and Kila markets were married. Most of the respondents were married with 98% while 2% were unmarried (Haruna *et al.*, 2012). As for marital status, 75% of the respondents are married, 10% are single, 11.3% are divorced and 3.8% are widowed/widower. Since majority of tomato retailers were married, there is a tendency that tomato retailers are more stable as marriage guarantees stability in their activities which may lead to increase their market performance from learning by constant practice (Egbeadumah *et al.*, 2016).

Family Size

Egbeadumah *et al.* (2016) shows that household size, 10% of tomato retailers have household size of 1 to 4 members; 62.5% of respondents have 5 to 8 members; 23.8% of respondents have 9 to 12 members; 2.5% of respondents have 13 to 16 members and finally 1.3% of respondents have 21 and above members. Since majority of have household have 5 to 8 members there is an evidence of the availability of family labour as well as household size is of great importance to sustain small scale business. Haruna *et al.* (2012) indicated that family size of 6-10 and 1-5 accounted for 46% and 32%, respectively. While 14% and 8% accounted for family size of 11-15 and 16 and above, respectively. The result implies that only small to medium family size holders in the study area were engaged in the raw tomato business. The very low percentage of family size may perhaps be connected with few numbers of wives in the marriage institution even when predominated by Muslims faithful whose religion permit practicing of polygamy. Shehu and Salman, (2017) revealed that family size ranged between 3 and 12 persons with an

average of 8 persons. Obayelu *et al.* (2014) further revealed that majority (67.5%) of the marketers is married with a mean household size of approximately 6 persons. The average household size of 5 (42.5%) and 4 (30%) persons in Olodo and Kila markets respectively. This implies that more family labour will be employed in tomato marketing enterprise (Sanusi and Dada, 2016).

Educational Qualification

Egbeadumah *et al.* (2016) further revealed that 63.8% of the respondents have attended formal education, 18.8% have attended quranic education and 17.6% did not attend any form of education. As for number of years spent in school by respondents, 35.1% did not attend any form of school; 21.3% attended primary school; 12.5 % attended junior secondary school; and 31.3% of attended senior secondary school. These results imply that tomato retailers are literate enough to adopt any form of strategies in order to improve their businesses (Egbeadumah *et al.*, 2016). Haruna *et al.* (2012) shows that majority (76%) of the respondents had post primary education while minority (24%) had primary education. The results signify that the sample size are fairly educated which is of significant importance in their marketing decision making process. According to Shehu and Salman, (2017) about sixty-four percent (64%) of the respondents were literate. Given this level of literacy, it is expected that information can be disseminated with ease among the respondents. Education is a crucial factor for skill development and enhancing effective production and marketing decisions (Bezabih and Hadera, 2007). In terms of education, the findings showed that 20 wholesalers (50%) and 29 retailers (72.5%) have never been to school, 13 wholesalers (32.5%) and 8 retailers (20%) passed primary education, 4 wholesalers (10%) and 2 retailers (5%) went to secondary school, while 3 wholesalers (7.5%) and 3 retailers (7.5%) had organic education Maimouna and Wang (2013). Upton (1987) reported that education has an important influence in managerial ability and decision making. Distribution of the marketers by education showed that most (47.5%) of the marketers had no formal education. The mean year in school of 5.3 years implies that majority of the marketers had little or no formal education which would have significant influence on their marketing decision making process and sales (Obayelu *et al.*, (2014). Lawal and Idega (2004) in Borno State, Nigeria observed that the level of education attended by the marketers to a large extent determine the strategies, which he/she may use to solve his/her marketing problem and to adopt new innovation without difficulties that will increase his profit as soon as they became available to him/her. Sanusi and Dada, (2016) shows that 50.0% and 57.5% of the marketers in Olodo and Kila Ogun State respectively were not formally educated. Lack of formal/low level of education could have necessitated the involvement of the respondents in tomato marketing due to the perceptual attitude of low capital investment in agricultural produce marketing by many people.

Marketing Experience

Obayelu *et al.* (2014) shows that mean year of experience of marketing of the marketers was 14.75 years. This implies that the marketing of fresh tomatoes is done practically by well experienced marketers which corroborate the findings of Emam (2011). Ali *et al.*, (2008) asserted that marketing experience is important in determining the level of profitability

obtained by a marketer. The more years of marketing experience, the more knowledge and profits the marketers tends to get, as he/she will use his/her understanding of the marketing system, market condition, market trends and price. And also 35% each had 11 – 15 years marketing experience in both markets and this could be an indication that the marketers possess substantial wealth of experience which could influence profitability in the study area (Sanusi and Dada, 2016). Majority (40%) had 6-10 years of experience while 30% had 1-5 years of experience (Haruna *et al.*, 2012). The respondents' years of experience ranged between 5 and 30 years with an average of 13.9 years (Shehu and Salman, 2017). This indicates that most of the respondents have been involved in tomato marketing for quite a long time. Maimouna and Wang, (2013) revealed that 9 wholesalers (22.5%) and 6 retailers (15%) had an experience of between 1 and 3 years, 17 wholesalers (42.5%) and 12 retailers (30%) practiced for 3 to 5 years, while 14 wholesalers (35%) and 22 retailers (55%) have more than 5 years' experience.

Marketers Association

Shehu and Salman, (2017) reported that most (79.2%) of the respondents belonged to one cooperative society or the other and so had access to credit facilities. According to Akinsanmi *et al.* (2005), cooperatives are a vehicle for development since they provide informal credit to farmers. Members of the cooperative, *ceteris paribus*, are likely to perform better than non-members because of possible economies of scale. The survey of Alemnew (2010) on market association of red pepper marketers, in Ethiopia reported that all the sample traders store the product on the average for 52 days before sale. From the total respondents 93% of them have a separate place of storage while 7% of traders use residence store. To exchange market information 93% of traders, use mobile telephone while the remaining ones use fixed telephone. Traders source of capital was on average 70% own capital with only few traders that had access to credit. The main source of credit was ACSI with annual interest rate of 12.5%.

Source of Capital

Obayelu *et al.* (2014) further revealed that majority (64.9%) of the marketers' source their capital from family members, 32.5% started their business with personal savings and 1.3% started with bank loans and loans from cooperatives respectively. This shows that there is very little assistance from formal lending institutions to fresh tomato marketers in the study area.

Size of Income Per annum

Sanusi and Dada, (2016) revealed that some (27.5%) of the marketers earned between N5000.00 - N7000.00 income per week in Olodo market while 27.5% earned below N5000.00 income per week in Kila market. According to Luyengo (2013), a study conducted in Kwara State reported that 6% of the respondents had market income of less than E20,000 per amount.

Marketing Channels of Fresh Tomato: Maimouna and Wang, (2013) identify two major marketing channels of fresh tomato for marketing in the district of Bamako in Mali:

1. Producer – Wholesaler – Retailer – Consumer.
2. Producer – Retailer – Consumer.

According to Acharya and Agarwal, (1999) in India, the marketing channels are the routes through which agricultural products move from the point of production to the final point of consumption. In other words, marketing channels are the way through which products from producers are passed down to the consumers. In this process, the products undergo a change in time, place, form and ownership, which add to their value (Karki, 2002). The shorter the channel, the lesser the marketing costs and cheaper the commodity to the consumer (Scribid, 2010). When there are more intermediaries in the channel the prices of commodities will be higher and producer's share will be lesser. So we can say that long marketing channel is one of the main reasons for increased marketing costs and bring inefficiency in marketing. This results in the loss of consumers' welfare and producers' share. Presence of intermediaries makes the marketing system inefficient in the long channels as compared to the shorter ones (Hossain, *et al.*, 1996).

Adepetu, *et al.* (2005) identified five types of channels in tomato marketing in Nigeria. They have mentioned that:

Producer-retailer-consumer,
 Producer-assembler-retailer-consumer,
 Producer-assembler-bulk purchaser-agent-retailer-consumer,
 Producer-commission agents-bulk
 Purchaser-agent-retailer-consumer and
 Producer-commission agents-retailer-consumer.

Huang, *et al.* (2009) found that farmers were disposing vegetables through traditional marketing channels. Further they reported that about 80 percent of vegetable marketing at farm gate was conducted by wholesalers. Adenuga, *et al.*, (2013) also, in Kwara State identified three main vegetable marketing channels in the study area. They are namely:

Marketing Channel (1): Farmers – wholesalers – retailers – consumers;

Marketing Channel (2): Farmers – itinerant buyers – retailers – consumers;

Marketing Channel (3): Farmers – itinerant buyers – wholesalers – retailers – consumers.

Olukosi and Isitor (2008) a study conducted in Western Europe they revealed that the main marketing channels of red pepper identified from the point of production until the product reaches the final consumer through different intermediaries were:

Channel 1: producer → consumers
 Channel 2: producers → retailer → consumers
 Channel 3: producers → wholesaler → consumers
 Channel 4: producers → wholesaler → retailers → consumers
 Channel 5: producers → rural assemblers → wholesalers → consumers
 Channel-6: producers → rural assemblers → retailers → consumers
 Channel-7: producers → primary cooperatives → cooperative union → consumers.

According to Thapa and Paudyal (2003), farmers bring their agro produces to the local market and sell either to retailers or directly to the consumer. Such type of marketing channels is found in the Terai and hill regions of Nepal. The type of marketing channels depends upon the scale of production, distance to the market and source of agro produce in Nepal.

For marketing of vegetables, Thapaliya (2006) in Nepal mentions three main marketing channels followed according to the type of vegetables. The leafy vegetables follow the first channel, i.e. farmer-retailers/consumer; whereas other fresh vegetables follow the second channel, i.e. farmer/farmer group/cooperative-collection centre-intermediary-urban whole sale-retailer/hawker/Indian wholesaler-consumer/exports to India; and non-perishable vegetables such as potato, onion, garlic follow the third category of channel, i.e. importer-urban wholesale market-retailer-consumer. These vegetables (onions, garlic, potato) mostly come from foreign markets (India, Tibet). In India, Chauhan and Singh (1998) found mainly three channels of vegetable growers for the disposal of vegetables in their study. The most important channel, which had been adopted by the majority of farmers in the study area, was the channel involving commission agent and retailer. However, in the most predominant channel comprising producers, commission agent, retailer and consumer, the net price received by the producer was in the range of 60 to 63 percent. The leading marketing channels of farm products used by the farmers are local assemblers, followed by financier-middlemen and wholesalers. Due to lack of organization, the farmers can only sell their products in the local market where prices are dependent mainly on the law of supply and demand which is unstable.

Teka (2009) found eight marketing channels for tomato in Ethiopia. The main receivers from the producers were wholesalers, retailers and rural assemblers, and with an estimated share of 44.7, 40.4 and 8.5 percent, respectively. The channel of producer-retailer-consumer was found to carry the largest share followed by producer-wholesaler-retailer-consumer with the volume of 552 quintals and 382 quintals respectively. Eleven lines of marketing channels of tomato were identified by Weldesslassie (2007) in a study conducted in Amhara national regional state of Ethiopia. The main receivers from the producers were rural assemblers, retailers and wholesalers and with an estimated share of 43.29, 33.36 and 22.25 percent, respectively. Piya (2001) identified four types of marketing channels for winter vegetables (cauliflower, cabbage, radish and cucumber) in Chitwan district of Nepal. These channels were:

Producers-consumers, producers-retailers-consumers,
Producers-wholesalers-retailers-consumers
and Producers-contractors-retailers-consumers.

According to Adhikari (2002) there are three channels for marketing of cauliflower and cabbage in Palpa district of Nepal. These include:

Farmers-consumers, farmers—retailers-consumers,
farmers-dokes-consumers.

Fresh vegetables in Dhankuta district of Nepal and found seven types of marketing channels:

Channel 1: Producers-consumers
Channel 2: Producers-retailers-consumers
Channel 3: Producers-collectors-retailers-consumers
Channel 4: Producers-wholesalers-retailers-consumers
Channel 5: Producers- wholesalers-processors-consumers
Channel 6: Producers-cooperatives-export (to India)
Channel 7: Producers-cooperatives- wholesalers-retailers-consumers (Acharya, and Agarwal,1999).

Market Structure of Fresh Tomato: A market structure refers to the organizational characteristics that establish interrelationships between the buyers and sellers of a particular market (Adegeye and Dittoh, 1985). Market structure is the degree of buyers and sellers' concentration of a commodity. Imoudu and Afolabi (2002) posited that market structure for agricultural products in Nigeria is not perfectly competitive due to collusive tendencies of sellers by forming associations for particular product. An efficient marketing system can only operate where there is good market structure and conduct in place and it is fully utilized (Adegeye and Dittoh, 1985). Analysis of the market structure, efficiency and margin for fresh tomato product therefore, determines whether the market is a perfectly competitive, oligopolistic or monopolistic market. According to Egbeadumah *et al.* (2016) the sale made by tomato retailers and was categorized with an interval of ₦5000. He reported that 3.75% of the retailers who fall into a monthly sales of 0 – 5000 naira control 0.43% of the market share, 5% of the retailers who are in the category of 5001 – 1000 naira monthly sales control 1.5% of the market share, 5% of the retailers who are in the category of 10001 – 15000 naira monthly sales control 1.69% of the market share, 13.75% of the retailers who are in the category of 15001–20000 naira monthly sales control 6.38% of the market share, 18.75% of the retailers who are in the category of 20001 – 25000 naira monthly sales control 10.99% of the market share, 21.25% of the retailers who are in the category of 25001 – 30000 naira monthly sales control 15% of the market share, 6.25% of the retailers who are in the category of 30001 – 35000 naira monthly sales control 5.3% of the market share, 2.5% of the retailers who are in the category of 35001 – 40000 naira monthly sales control 2.5% of the market share and 23.75% of the retailers who are in the category of 40001 and above monthly sales control 56.71% of the market share (Egbeadumah, *et al.*, 2016). The Gini coefficient of 0.8 shows that there is inequality in revenue realization by the tomato sellers. With a Gini coefficient value of 0.8 which is closer to 1. Taruet *al.* (2010) in their study on structural analysis of paddy markets in southern part of taraba state, Nigeria indicates that the tomato market is competitive With a Gini coefficient value of 0.74 which is closer to 1 in Abeokuta South, Ogun State, Nigeria

Profitability of Fresh Tomato Marketers: Haruna, *et al.* (2012) in their study of economic analysis of fresh tomato marketers in Bauchi metropolis of Bauchi State, Nigeria indicated that (99.99%) and fixed cost (0.01%) of the total cost of marketing fresh tomatoes in the study area. The results further indicated that the cost of acquisition (87.46%), cost of empty basket (4.37%) and transportation cost (2.04%) were the major variable costs incurred in tomato marketing. Based on the computation per basket, the average basket of tomato was 50kg and average price per basket was N3,000, total cost of marketing was N68,670 while the total revenue of N 80,000 was realized making a net income per ton of N 11,330. In review of this costs and returns results, the raw tomato marketing in Bauchi metropolis was highly profitable since the gross ratio (0.86) was positive and less than one. Sani and Haruna, (2010) in their study in Kogi State concluding that the cost and returns analysis of vegetable crop production was economically viable and sustainable based on the applied planning model implying that supply response was not a problem but rather value addition and marketing components of the produce which needed to be planned and sustained. Egbeadumah, *et al.* (2016) confirm that marketing margin

tomato retailing is a profitable enterprise in Abeokuta South and Ogun State, Nigeria with Marketing margin of ₦536. Umar and Yaro, (2017) from their result presented it could be deduced that the on fresh tomato retail marketing in the study area was profitable, a net profit margin of N452.6 confirmed the observation and Giroh, (2010) reported a profit margin of about N500. Shehu and Mohammed, (2017) revealed that the average rate of returns to total investment was 52.6%. This implies that an average profit of N0.53k was realized on every naira invested in vegetable marketing in the area. This signifies that, on the average, the investment was highly profitable. Obayelu *et al.* (2014) indicated that the cost and return analysis of fresh tomato marketing revealed that no fixed costs were incurred. The variable costs constitute 100% of the total cost of marketing fresh tomatoes in the study area. The results further indicated that the cost of purchase (99.75%), transportation cost (0.10%) and rental cost (0.07%) were the major variable costs incurred in tomato marketing. Based on the computation per basket, the average basket of tomato was 30kg and average purchase and selling price per basket was ₦4,598.75 and ₦6,186.25. An average of 4.425 baskets (132.75kg) of fresh tomatoes was sold per marketer per month. This gives total revenue of ₦27,374.16 and a gross margin of ₦6,976.12. The return per naira invested was 1.34k indicating that the enterprise is profitable. In review of this costs and returns results, fresh tomato marketing in the study area was profitable.

Constraints Faced by Tomato Marketers

Haruna, *et al.* (2012) shows that 46% of the marketers were faced with the problem of high cost of purchasing from farm gate during lean season production, this could be as a result of the seasonality nature of the crop follow by lack of storage facilities that accounted for 30%, difficulty to purchase as a result of production fluctuation (10%) and other constraints (14%). Egbeadumah *et al.* (2016) revealed that the common problems facing tomato retailers in Abeokuta south local government. The top five problems facing the retailers are transportation, losses due to breakage, losses due to rodent attack, poor quality of products and shortage in supply. The major problem facing fresh tomato marketers in Kwara State was inadequate capital (29.2%). About 23% and 19.2% of respondents claimed the high transportation cost and perishability of the commodity as their major problems, respectively (Shehu and Mohammed, 2017). Obayelu *et al.* (2014) confirm the distribution of the problems faced by fresh tomato marketers in Lagos State. Most (29%) of the marketers were faced with the problem of inadequate storage facilities which often lead to produce loss due to spoilage as a result of fungal and bacteria attack, insects and rodent's infestation. These result into increase in marketing costs leading to higher retail prices and reduced marketing efficiency. High cost of transportation due to inadequate transport facilities (23%), lack of capital (20%), lack of access to formal credit (18%) and lack of market facilities such as water, toilets and good roads (10%) are other constraints to the marketing of tomato in the study area. Sanusi and Dada, (2016) reported that 32.5% of the marketers were faced with the problem of high purchasing price of tomato from the wholesalers in Olodo market; this problem could have a ripple effect on the consumers since the retailers will want to make profit on investment, thereby increasing the price of tomato at the consumer level. Also in Kila market, 25% of the marketers were faced with problem of high cost of purchasing produce from wholesalers during lean

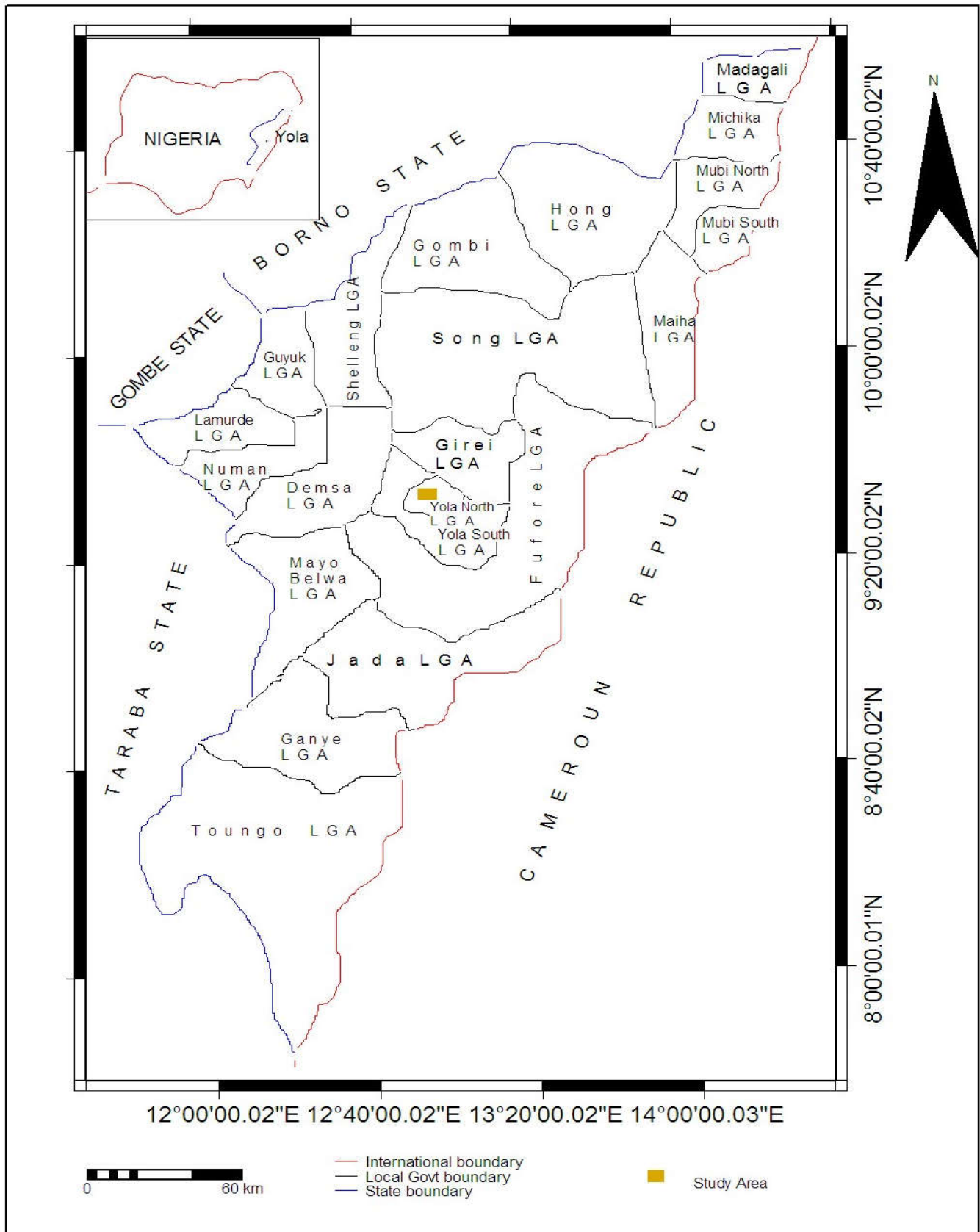
production season; this could be as a result of the seasonal nature of the crop. Furthermore, inadequate preservation accounted for 17.5% of the problems faced by tomato marketers in Olodo market while 15.0% were having the same problem in Kila market. High market levy from both local government authority and market leaders accounted for 10.0% each of the constraints faced by marketers in Olodo and Kila markets.

RESEARCH METHODOLOGY

Study Area

The study was carried out in Mubi metropolitan Area of Adamawa State. Mubi metropolis is located in North Eastern part of Adamawa State. Adebayo (2004) reported that Mubi metropolis is a geo-political area comprising of two Local Government Areas (LGAs); Mubi North and Mubi South. The metropolis is located between latitudes 10° 05' and 10° 30'N of the equator and between longitude 13° 12' and 13° 19'E of the Greenwich meridian. The two local government areas occupy 192,307 kms and support a total population of 260,009 people (National Population Census, 2006). The area shares a boundary with Maiha L.G A in the South, Hong L.G.A in the West, Michika L.G.A and Cameroon Republic in the East.

The vegetation of Mubi and its environments fall within the Sudan savannah belt of Nigeria where vegetation zone is referred to as ambrosiaceous wood land savannah (Adebayo and Tukur, 2014). About 70% of the vegetation is grasses and weeds with few scattered woody plants which make up part of the natural vegetation and the exotic breed (animals) which were brought from other areas into the region. However, the natural vegetation has been altered by human activities such as cutting of trees for fuel, settlement expansion, and farming activities, bush burning, and local lumbering. Despite the existence of forest reserves, grazing areas and plantation form part of the land cover in various locations especially Muva, Mayo-Bani, Betso and Vimtim (Adebayo, 2014). The growth of Mubi town is traced to the agricultural, administrative and commercial functions it performs (Adebayo, 2014). Mubi has a tropical climate. Rainfall is more pronounced around the vicinity of Mandara hill, the average rainfall in the area is about 100mm/annum. In Mubi, the average annual temperature is 25.4 °C. About 935 mm of precipitation falls annually. The driest month is January, with 0 mm of rainfall. Most precipitation falls in August, with an average of 258 mm. The warmest month of the year is April, with an average temperature of 29.3 °C. In August, the average temperature is 23.4 °C. It is the lowest average temperature of the whole year (Adebayo and Tukur, 2014). By 1902, Mubi was a German base from where the neighboring tribes (i.e Fali, Gude, Kilba, Higgi, Margi and Njanyi) of the region were subjugated. On 1st April 1960, Mubi was made the native authority headquarters. The same year, July 1960, the town became provincial headquarters of the defunct Sardauna province. In 1967, Mubi was made L.G.A headquarters while in 1996, the town was divided into Mubi-North and Mubi-South Local Government Areas. Currently, the town is the seat of Mubi Emirate Council and is the headquarters of the Adamawa-North Senatorial District (Adebayo, 2014). The major indigenous tribes in the town are Fali and Gude, with some neighboring tribes such as Njanyi, Margi, Higgi, Kilba and Fulani. There are also many ethnic groups that live in the town who came from virtually all the states in Nigeria perhaps due to the socio-economic activities of the town (Adebayo, 2014).



Source; Adebayo et al. (2014).


Study area:  - Mubi Metropolitan (Mubi north and south LGAs)

Fig. 1 Map of Adamawa State Showing Sampled Study Area

Mubi is geographically well placed and functions not only as the center of commerce in the region but also extends its sphere of influence to countries such as Cameroun, Central Africa Republic and Chad. Numerous banks, filling stations, guest houses, restaurants and hotels exist in the town to support the commercial activities. Another factor that led to growth of the town is rural-urban migration experienced from the surrounding villages. More over the town has become center of learning with numerous secondary and tertiary institutions established in the metropolitan Area, such as; The Federal Polytechnic, Adamawa State University, and College of Health Technology.

Source and Method of Data Collection

For the purpose of this study, primary sources of data was utilized. Primary data was collected with the use of well-constructed questionnaire. Primary data was collected from traders which was focus on socio-economic characteristics of marketers, marketing channel, profitability of fresh tomato marketing and problems affecting fresh tomato marketing.

Sampling Techniques and Sample Size

Purposive and simple random sampling technique were adopted for the selection of respondents for the study. Mubi metropolitan area will be selected purposively because of its relative importance in fresh tomato marketing. Four market were selected purposively. 100 fresh tomato marketers was generated from vegetable market association register which was serve as the sampling frame which consist of the total marketers from four markets, two from Mubi South and two from Mubi North. The sample size was selected through random sampling of 50-65% of respondents from each of the markets.

Methods of Data Analysis

The analytical tools used include descriptive and inferential statistics.

Descriptive Statistics: These involved the use of mean, frequency distribution, percentages and tables for presentation of results. It was used to analyze the socio-economic characteristics of fresh tomato marketers (objective i) and also describe the marketing channels of fresh tomato marketing in the study area, (Objective ii) and problem affecting fresh tomato marketing (Objective v).

Inferential Statistics: This involved the use of Herfidahl Hirschman index (HHI index) and Gini coefficient (GC) and were used to determine the extent of market structure.

$$HHI = \sum_i^n = 1MS^2$$

Where;
MS: - is the market share of seller
i and n:- is the number of sellers in the market.

$$MS_i = \frac{V_i}{\sum_i^n V_i}$$

Where;
Vi:- indicate the quantity of tomatoes handled by seller

i and $\sum V_i$:- is the total quantity of tomatoes handled by sellers in the market.

$$\text{Gini coefficient} = \sum XY$$

Where;
X: Proportion of sales
Y: Proportion of sealers

Gross Margin model was employed to determine the margins of the marketers. The profitability of fresh tomato marketing enterprise wasdetermine using the profit margin analysis (objective iii).

The Gross Margin model was specified from the point of view of estimation of total expenses (costs) as well as various returns or revenue within a marketing period.

$$\text{Total Cost (TC)} = \text{TVC} + \text{TFC} \dots\dots\dots(1)$$

Where:
TVC = Total variable cost; TFC = Total fixed cost.

$$\text{Total Revenue (TR)} = Q. P_y \dots\dots\dots(2)$$

Where:
Q = Quantities of tomatoes sold in a basket;
Py = Unit price of tomatoes in baskets.

$$\text{Gross Margin (GM)} = \text{GI} - \text{TVC} \dots\dots\dots(3)$$

Where:
GI = Gross income; TVC = Total variable cost.

$$\text{Net Income (NI)} = \text{GI} - \text{TC} \dots\dots\dots(4)$$

To determine the profitability of tomato marketers, some ratios were calculated to show the overall performance of the business thus:

$$\text{Gross Ratio (GR)} = \text{TC} / \text{TR} \dots\dots\dots(5)$$

Where:
TC = Total cost; TR = Total revenue.

$$\text{Operating Ratio (OR)} = \text{TVC} / \text{TR} \dots\dots\dots(6)$$

Where:
TVC = Total variable cost;
TR= Total returns.

$$\text{Fixed Ratio (FR)} = \text{TFC} / \text{TR} \dots\dots\dots(7)$$

Where:
TFC = Total fixed cost;
TR= Total revenue.

RESULT AND DISCUSSION

This chapter deals with the result and discussion of socio-economic characteristics of fresh tomato marketers, marketing channels of fresh tomato, cost and return of fresh tomato marketing and problems affecting fresh tomato l marketing.

Socioeconomic Characteristics of Fresh Tomato Marketers

Table 1 revealed that 4.1% were within the age bracket of 10-20 years, 20.4% were 21-30 years, 46.9% were between 31-40 years, 20.4% between 41-50 years, 6.1% between 51-60 years and above 60 years were 2.1%. The study indicated that majority (49.9%) of the sampled fresh tomato marketers are in their most active age (31 to 40 years). Hence, their strength can be effectively utilized in tomato marketing as it agrees with the study of Obayelu *et al.* (2014) who reported that the marketers mean age of 40.81 years indicates that the tomato marketers are in their economic active years. The Table also revealed that 76.5% of the respondents were male and only 23.5% of them were female. This shows that most of the marketers are male. This is contrary with the study of Egbeadumah, *et al.* (2016) who reported that females are predominantly involved into tomato business. 59.2% of the total respondents were married, 10.2% were single, 18.4% were divorce and 12.2% were widow/widower. This implies that most of the respondents were married and there is a tendency that tomato retailers are more stable as marriage guarantees stability in their activities which may lead to increase their market performance from learning by constant practice, as reported by Haruna *et al.*, (2012) that most of the marketers of tomato were married and Sanusi and Dada, (2016) about 45.0% and 37.5% of the marketers in Olodo and Kila markets were married.

The study indicated that 44.9% have family size of 1-5 members, 34.7% have 6-10 persons, 16.3% have 11-15 persons and 12.2% have 16-20 persons, suggesting that, household size was relatively large, hence, more family labour will be employed in tomato marketing enterprise. This study is consonant with the study of Shehu and Salman, (2017) who revealed that family size ranged between 3 and 12 persons with an average of 8 persons. The Table 1 shows that 75.5% of the respondents had no formal education and could not read or write effectively and only 24.5% of them had formal education. This disagrees with the study of Egbeadumah *et al.* (2016) who revealed that majority (63.8%) of the respondents have attended formal education. 100% of the marketers belong to marketers association and this will help the have access to cooperative loans and supply of inputs which could increase tomato marketing as reported by Shehu and Salman, (2017) that most (79.2%) of the respondents belonged to one cooperative society or the other and so had access to credit facilities. Table 1 indicated that 4.1% of the respondents are farmers, 3.1% are civil servant and 92.8% of them are traders. This shows that majority of them engaged in marketing of fresh tomato as full time business and do not have any other business apart from it with 13.3% of the respondents had 1-5 years marketing experience, 42.9% have 6-10 years marketing experience, 14.3% have 11-15 years marketing experience, 17.3% have 16-20 years marketing experience, 9.1% have 21-25 years marketing experience and only 3.1% were engaged in the business for more than 25 years. This showed that few of the respondents were in the business for long period of time. This study is contrary with the study of Shehu and Salman, (2017) who indicates that most of the respondents have been involved in tomato marketing for quite a long time. Most of the respondents (93.9%) obtained their initial capital outlay from their personal saving, 6.1% was borrowed. This shows that majority of the respondents obtained their initial capital from their personal saving and this led to their (marketers) inability to operate large-scale business in the study area. These findings disagree with the findings of Obayelu *et al.* (2014)

who revealed that majority (64.9%) of the marketers' source their capital from family members.

Table 1. Socio- economic Characteristic of the Respondents

| Attribute | Frequency | Percentage |
|---|-----------|------------|
| Age | | |
| 10 – 20 | 4 | 4.1 |
| 21 – 30 | 20 | 20.4 |
| 31 – 40 | 46 | 46.9 |
| 41 – 50 | 20 | 20.4 |
| 51 – 60 | 6 | 6.1 |
| > 60 | 2 | 2.1 |
| Total | 98 | 100 |
| Gender | | |
| Male | 75 | 76.5 |
| Female | 23 | 23.5 |
| Total | 98 | 100 |
| Marital Status | | |
| Married | 58 | 59.2 |
| Single | 10 | 10.2 |
| Divorce | 18 | 18.4 |
| Widow | 12 | 12.2 |
| Total | 98 | 100 |
| Family Size Distribution | | |
| 1 – 5 | 44 | 44.9 |
| 6 – 10 | 34 | 34.7 |
| 11 – 15 | 16 | 16.3 |
| 16 – 20 | 4 | 4.1 |
| Total | 98 | 100 |
| Educational Level Distribution | | |
| Formal | 24 | 24.5 |
| Non – formal | 74 | 75.5 |
| Total | 98 | 100 |
| Membership of Association Distribution | | |
| Affiliated | 98 | 100 |
| Non – Affiliated | 0 | 0 |
| Total | 98 | 100 |
| Occupation Distribution | | |
| Farming | 4 | 4.1 |
| Civil Servant | 3 | 3.1 |
| Trading | 91 | 92.8 |
| Total | 98 | 100 |
| 1 – 5 | 13 | 13.3 |
| 6 – 10 | 42 | 42.9 |
| 11 – 15 | 14 | 14.3 |
| 16 – 20 | 17 | 17.3 |
| 21 – 25 | 9 | 9.1 |
| > 25 | 3 | 3.1 |
| Total | 98 | 100 |
| Source of Capital | | |
| Personal savings | 92 | 93.9 |
| Borrowed | 6 | 6.1 |
| Total | 98 | 100 |

Source: Field Survey, 2019.

Marketing Channels of Fresh Tomato

The analysis of fresh tomato marketing channels shows that 15.3% marketers uses channel 1, 76.5% adopted channel 2, 5.1% uses channel 3 and 3.1% of the respondents uses channel 4. This analysis indicated channel 2 (producer's wholesaler's retailer consumers) is the major channel of fresh tomato marketing in the study area as illustrated in Table 2 below. This study is in line with the study of Teka (2009) who found that producer-retailer-consumer was the main channel among the eight marketing channels for tomato in Ethiopia.

Structure of Fresh Tomato Marketing

The distribution of the marketers by their income or sales and the number of marketers were presented in the Table 3 below. The analysis of *Gini* coefficient show the value of 0.64892 implying high inequality among fresh tomato marketers. This is an indication that there is fresh tomato marketers exercising control over the market price.

Table 2. Channel of Fresh Tomato Marketing

| Channels | Frequency | Percentage |
|--|-----------|------------|
| 1. Producer →Retailer →Consumers | 15 | 15.3 |
| 2. Producer →wholesalers →Retailer →Consumers | 75 | 76.5 |
| 3. Producer →Rural Assemblers →Retailers →Consumers | 5 | 5.1 |
| 4. Producers →collectors →Wholesalers →Retailers→Consumers | 3 | 3.1 |
| Total | 98 | 100 |

Source: Field Survey, 2019

Table 3. Structure of Fresh Tomato Marketing

| S/N | Range of income sales | Frequency of sellers | Cumulative frequency | Proportion of sealers (Y) | Cumulative Proportion of marketers | Total of sales | Proportion of sales (X) | Cumulative proportion of total sales | XY |
|-------|-----------------------|----------------------|----------------------|---------------------------|------------------------------------|----------------|-------------------------|--------------------------------------|---------|
| 1 | < 10,000 | 21 | 21 | 0.21 | 0.21 | 14,3000 | 0.05 | 0.05 | 0.0105 |
| 2 | 10,000-20,000 | 40 | 61 | 0.41 | 0.62 | 587,500 | 0.23 | 0.28 | 0.1148 |
| 3 | 21,000-30,000 | 8 | 69 | 0.08 | 0.7 | 205,500 | 0.08 | 0.36 | 0.0288 |
| 4 | 31,000-40,000 | 4 | 73 | 0.04 | 0.74 | 143,600 | 0.06 | 0.42 | 0.0168 |
| 5 | 41,000-50,000 | 3 | 76 | 0.03 | 0.77 | 139,000 | 0.05 | 0.47 | 0.0141 |
| 6 | 51,000-60,000 | 7 | 83 | 0.07 | 0.84 | 394,600 | 0.15 | 0.62 | 0.0434 |
| 7 | 61,000-70,000 | 4 | 87 | 0.04 | 0.88 | 256,500 | 0.10 | 0.72 | 0.0288 |
| 8 | 71,000-80,000 | 1 | 88 | 0.01 | 0.89 | 72000 | 0.02 | 0.74 | 0.0074 |
| 9 | 81,000-90,000 | 6 | 94 | 0.06 | 0.95 | 221,900 | 0.089 | 0.829 | 0.04974 |
| 10 | 91,000-100,000 | 1 | 95 | 0.01 | 0.96 | 100,000 | 0.04 | 0.869 | 0.008 |
| 11 | >100,000 | 3 | 98 | 0.03 | 0.99 | 221,900 | 0.089 | 0.958 | 0.02874 |
| TOTAL | | 98 | | 1.00 | | 249,2000 | | | 0.35108 |

Source: computed result, 2019

Gini coefficient = $1 - \sum XY$; GC = $1 - 0.35108$; Gini Coefficient = 0.64892

In other words, there is a reflection of high level of income inequality from sales among the marketers in the study area.

Gross Margin Analysis of Fresh Tomato Marketing

The cost and return associated with fresh tomato marketing in the study area is analyzed in Table 4. The cost component were variables and fixed costs. The variable costs include purchasing of the fresh tomato, packaging materials, transportation and telephone call, and fixed costs include rent. The returns associated with tomato marketing is sales of the product (fresh tomato). The cost and returns were used in determining the profit of fresh tomato retail marketing enterprise in the study area with the use of gross margin analysis as shown in the Table 4. The analysis of costs and returns per basket per day of fresh tomato marketing in the study area revealed that the total variable cost incurred was ₦8,083 while fixed cost amounted to ₦52, the total cost amounted to ₦8,135. Similarly, on the return side the average total revenue amounted to ₦9,350. Based on the costs and return analysis in table, the gross margin of the marketers was estimated to ₦1,267 while the net income was ₦1,215 and the gross ratio is 0.88 per basket per day and they averagely sale 1-2 baskets per day. Therefore, costs and returns analysis of fresh tomato marketing enterprise in the study area is profitable and economically viable means of earning livelihood in Mubi metropolitan area despite the constraints being encountered. This study agrees Haruna, *et al.*, (2012) who revealed that red pepper marketing in Bauchi metropolis was highly profitable since the gross ratio (0.86) was positive and less than one. This finding is also, in consonance with the study of (Bakari and Usman, 2012) who showed that vegetable marketing is profitable in Yola- North and South Local Government Areas of Adamawa State, Nigeria.

Constraint Associated with Fresh Tomato Retail Marketing

Result in Table 4 revealed that, 6.8% inadequate market structure, 11.2% inadequate capital, 7.9% bad road network, 10.4% perish ability, 6.1% shortage of supply, 11.1% lack of

storage facilities, 4.4% poor market structure and communication, 5.2% administration measure and multiple taxation, 10.1% inadequate government support, 8.6% too much competition with license traders, 7.2% farmers reluctant to invest more due to low price and 11.0% seasonality.

Table 4 Problems of Fresh Tomato Retail Marketing

| Items | Values (₦) |
|------------------------|------------|
| Variable Costs | |
| Acquisition cost | 7,800 |
| Transportation | 49 |
| Cost of empty basket | 45 |
| Water | 30 |
| Labour | 25 |
| Polythene | 80 |
| Taxes | 38 |
| Telephone calls exp. | 16 |
| Total Variable Costs | 8,083 |
| Fixed Costs | |
| Depreciation on rent | 52 |
| Total Fixed Costs | 52 |
| Total Costs | 8,135 |
| Returns | |
| Gross income | 9,350 |
| Return /naira invested | 1.2 |
| Gross margin | 1,267 |
| Net income | 1,215 |

Source: Field Survey, 2019.

*Multiple Responses

This shows that inadequate capital (rank 1), lack of storage facilities, seasonality and perishability (rank 2. 3 and 4) were the major problem affecting fresh tomato marketing in the study area. This agrees with the findings of Usman *et al.*, (2013) who also reported poor storage and processing facilities causes excessive losses of tomato at storage in Adamawa State, it also agrees with the study of Haruna, *et al.* (2012) who pointed out that high cost of purchasing from farm gate during lean season production as a result of the seasonality nature of the crop follow by lack of storage facilities.

Summary, Conclusion and Recommendations

The study analyzes tomato marketing in Mubi metropolitan area with specific objectives were to; describe the socio-

economic characteristics of fresh tomato marketers, identify existing marketing channels of fresh tomato in Mubi metropolitan area, examine the structure of fresh tomato marketing, determine the profitability of fresh tomato marketers and identify the problems affecting fresh tomato marketers. Primary data was the main source of data collected with the use of well-constructed questionnaire. Purposive and simple random sampling technique were adopted for the selection of respondents for the study. The analytical tools used include descriptive and inferential statistics such as Gini coefficient and gross margin. The result of the study revealed that 4. majority (49.9%) of the sampled fresh tomato marketers are in their most active age (31 to 40 years). Hence, their strength can be effectively utilized in tomato marketing with majority of them were male and were married. The study indicated that, household size was relatively large, hence, more family labour will be employed in tomato marketing enterprise and most of them had no formal education and could not read or write effectively. 100% of the marketers belong to marketers association and this will help them have access to cooperative loans and supply of inputs which could increase tomato marketing.

The analysis of the study shows that majority of them engaged in marketing of fresh tomato as full time business and do not have any other business apart from it with few of the respondents were in the business for long period of time. Most of the respondents (93.9%) obtained their initial capital outlay from their personal saving and this led to their (marketers) inability to operate large-scale business in the study area. The analysis also, indicated channel 2 (producer's- wholesaler's retailer- consumers) was the major channel of fresh tomato marketing in the study area and high inequality among fresh tomato marketers. This is an indication that there is fresh tomato marketers exercising control over the market price. The analysis of costs and returns per basket per day of fresh tomato marketing in the study area revealed that, it was a profitable and economically viable means of earning livelihood despite the constraints being encountered such that inadequate capital (rank 1), lack of storage facilities, seasonality and perishability (rank 2, 3 and 4) were the major problem affecting fresh tomato marketing in the study area.

Conclusion

the study concluded that fresh tomato retail marketing in Mubi metropolitan area of Adamawa state is a profitable venture and economically viable means of earning livelihood with the gross margin of ₦1, 267, net income of ₦1, 215 and the gross ratio of 0.88 per basket per day, despite the problems encountered by the marketers.

Recommendations

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

1. Farmers should be encouraged to form cooperative societies so as to enable them obtain loans from commercial banks and agricultural and rural cooperative bank, at regulated interest rates.
2. More supply of fresh tomato should be encouraged so as to bridge the gap between supply and demand of the commodity.

3. Processing of fresh tomato should be encouraged by providing processing and packaging machines.
4. Government should assist marketers to acquire capital by encouraging banks to give out loans to fresh tomato marketers at lower rate in the study area.
5. Government should provide storage facilities so as to ensure smooth marketing and to reduce the rate of fresh tomato spoilage. Development of improved tomato variety that have long shelf life can also go long way in minimizing losses.
6. Government and non-governmental organizations should support fresh tomato marketers by providing their necessary needs so as to boost fresh tomato marketing in the study area.
7. Construction of good feeder roads network to reduce transportation costs between the traditional surplus and deficit areas. Better and accessible roads are expected to improve, supply of inputs thus stimulating crop productivity, commodity delivery and consequently improve farmers bargaining power.

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