



STRATEGIES USED BY SUPPLY CHAIN ACTORS TO STAY IN FRESH TOMATO BUSINESS IN BAUCHI STATE, NIGERIA

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ABSTRACT

The study was conducted to examine the strategies applied by the supply chain actors to stay in fresh tomato business in Bauchi State, Nigeria. A multistage sampling technique was used to select 301 producers, 105 wholesalers and 252 retailers making a total of 659 Supply Chain Actors (SCA) for the study. The data were analysed using descriptive statistics only. The result shows that 35.67% of the producers used regular customers as a strategy to reduce transportation cost. About 44.68% and 58.78% of wholesalers retailers use collective transportation as means of reducing cost of transportation respectively. The result also indicates that 69.10%, 94.29%, 80.56% and 77.50% of producers, wholesalers, retailers and consumers belong to a cooperative society respectively. Further, a significant proportion (31.75%) of the producers used multiple production as strategy to stay in business. About 25.18% and 25.78% of wholesalers and retailers used collective transportation respectively. Again the result shows that producers (48.94%), wholesalers (35.64%), retailers (38.90%) and consumers (39.6%) sell and purchase their fresh tomato in farm gate, urban market from street hawkers. From the result it can be observed that producers (83.9%), wholesalers (91.4%) and retailers (58.3%) handled between 1 to 900 of fresh tomato per month. The result shows that 35.9% of the producers, 47.6% of wholesalers and 93.7% of the retailers sold their tomato at ₦601-₦700, ₦701-₦800, ₦800 and above per baskets respectively. the result also indicates that 17.61% of the tomato was sold by commission agents, 15.73% were sold by rural assemblers and 33.33% were sold to outside Bauchi state wholesalers. It can be concluded that SCA use one form of strategy to reduce cost of transportation and or to stay in business. The study recommend that SCA can contribute through cooperatives and buy bigger vehicles to ease transportation cost.

Keywords: Strategies, Fresh, Tomato, Business, , Chain, Actors

INTRODUCTION

Supply chain actors are members of a distribution channel. Distribution channel, otherwise known as marketing channel is a set of interdependent organizations that help make a product or service available for use or consumption by the consumer or business user. It consists of firms that have partnered for their common goal (Philip and Gary, 2007). Olukosi *et al.* (2004) defined marketing channel as a path of a product as it moves from producers to the final consumer. Agricultural producers do not work alone in creating values for consumers, instead they give some of their selling activities to channel workers (Nonyelu, 2013) such selling activities take place as the product moves from one point to another. These create a path known as marketing channel through which the commodity follows to the final consumer. Channel workers, otherwise known as middlemen help reduce the amount of work that is to be done by both farmers and consumers. For instance, farmers produce the products while middlemen create greater efficiency in making the product available to buyers. This justifies why Philip and Gary (2013) pointed out that a farmer is offered more than he/she can achieve on his/her own. More so, middlemen transform the assortment of product made by the producers into assortment that is wanted by the consumers. This shows that middlemen are given some control as to where and to whom they sell their product to.

FAO (2011) reported that efficiency in chain flow means the availability of efficient communication, transportation, processing and storage facilities, common grade and standard, credit



availability to finance short run inventory and processing operation. On the other hand, lack of such facilities and activities results into marketing inefficiency. The study of marketing channel helps in the understanding of the various costs incurred through the value chain at different levels of transaction. Marketing costs, according to Olukosi *et al.* (2007) are the actual expenses incurred in the performance of the marketing functions as the commodities move from the farm to the ultimate user. It is the sum total of all costs incurred by middlemen in assembling, processing, transporting, storing and distribution of a product.

Tomato is important in the diet of almost all the people in Nigeria. Its importance include: nutritional, medicinal and economic value (Oladapo *et al.*, 2011). However, it has been observed that the distribution of tomato products in Nigeria is surrounded by a number of constraints including poor transportation system, lack of information on both production and marketing (Olukosi *et al.*, 2010) Also, Yusuf *et al.* (2015) reported distance from producing areas to consumption areas as one of the problems affecting the distribution of fresh tomato. In Nigeria, for instance, the major tomato producing areas are in the northern part of the country while its high demand is in the southern part of the country. A good packaging material, good transport system and large cold storage facility could help in the smooth delivery of the tomato products. All these pose serious challenges to the tomato supply chain. In Nigeria, the estimated total loss in tomato is about 60%. Inadequate distribution of tomato does not only make it scarce to obtain but also reduces its consumption and pushes its prices to go up, usually beyond the reach of the lower income earners. Also, with the increasing population and rising standard of living of Nigerians, its demand is expected to rise. In other words, there is a ready market for tomato out there. Therefore, the need for tomato to be produced and distributed all the year round is important. However, its production is seasonal and consequently resulting to shortage in supply at certain period of the year. For instance, in the urban slums, the large number of consumers causes demand for tomato to rise during the off season. Inadequate supply of tomato in both rural and urban areas is crucial during raining season when marketing activities are reduced as a result of poor condition of feeder roads and unfavourable condition for tomato production in the raining season. Despite federal Government's efforts in form of programmes/projects for poverty alleviation, Nigeria still experiences serious food shortages (Afolabi, 2012). Causes of too much food for a stated time and too little for prolonged periods are common. This could be why food items such as rice and tomato have to be imported into the country. Erhabor and Ahmadu (2013) described Nigeria to be among the largest importers in the world. Between 2009 and 2010, a total of 105,000 metric tonnes of tomato paste valued at over ₦15 Billion was imported to bridge the deficit gap between supply and demand (Erhabor and Ahamadu, 2013). In view of the above mentioned problems, it then becomes necessary to examine the distribution channel for fresh tomato in Bauchi State. The broad objective of the study is to examine the strategies used by SCA to stay in fresh tomato business in Bauchi State. The specific objectives were to:

- i. describe the strategies used to stay in fresh tomato business;
- ii. identify the buyers and sellers of fresh tomato produced in Bauchi State;
- iii. examine the quantity of fresh tomato handled by the SCA.
- iv. identify both buying and selling points of fresh tomato in Bauchi State

METHODOLOGY

The Study Area

Bauchi State is the Study area. It is one of the thirty six States of Nigeria and was created in 1976. The State is boarded by Taraba and Plateau States to the South, Gombe and Yobe to the East, Kano and Jigawa to the North and Kaduna in the west (BSG, 2011) Bauchi State is divided into 3 agricultural zones namely: Northern, Central and Western zones. The State is made up of 20 Local Government Areas (LGAs) which are Bauchi, Kirfi, Alkaleri, Toro, Dass, Tafawa-Balewa, and Bogoro in the Western Zone; Zaki, Itas-Gadau, Gamawa, Jama'are, Katagum, Dambam, Giade, Shira and Misau in the Northern zone, and Darazo, Warji, Ningi and Ganjuwa are in the central zone. Bauchi State is located in the Northern Guinea Savannah Ecological zone of Nigeria. It lies between latitude 9° 3' and 12° 3' North of the equator and longitudes 8° 50' and 11° East of the Greenwich



Meridian. Bauchi State occupies a total land area of 49,119.000km² representing about 15% of the Nigerian's total land mass (BSADP, 2015). The State has an estimated population of 4,889,811.2 (NBS, 2016). Majority of the inhabitants are Geremawa, Hausa, Fulani, Sayawa, Jarawa and others. Most (80%) of the farmers of Bauchi State are predominantly subsistence farmers. The farmers in the state practice both dry and rainy seasons farming. They produce vegetables such as tomato, pepper, okra, lettuce, cabbage, amaranth among others. Other major crops produced include rice, maize, millet, cowpea, acha, groundnut, sesame and guinea corn. They also keep livestock such as goats, sheep, cattle, and poultry.

The temperature range is 9.11 °C minimum and 40.55 °C maximum (BSADP, 2015). Bauchi State is characterized by a dusty atmosphere referred to as harmattan with visibility being as low as 100m. This wind system is responsible for the rainy season experienced in the State. The mean annual rain fall ranges from 700mm in extreme north (Zaki) and 1300mm in the southern part (Toro) of the State. The State is characterized by two distinct seasons (the rainy and dry seasons). The rainy season begins from May and ends October and the dry season starts November and ends in April.

Sampling Techniques and Sample Size

The target population for the study was the fresh tomato small scale producers, marketers and consumers. A preliminary survey was conducted in order to identify the major tomato producing areas in each zone, during which some questionnaires meant for the collection of the data for the study were pre-tested and observations were made. Both purposive and random sampling techniques were used. First, a purposive sampling technique was used to select three local government areas from each zone and two villages from each of the selected LGAs. This gave the total number of 9 LGAs and 18 villages. The purposive selection of both the LGAs and villages was based on the intensity of tomato production in the areas, and the need for a spread of the research work was also put into consideration. These LGAs and their villages in bracket were as follows: Northern zone; Jama'are (Dogon-Jeji and Gongo); Zaki (Sakwa and Ariri); Misau (Zindi and Misau); Central zone: Warji (Badeyaso and Wando); Ningi (Kafin Zaki and Tsangaya), Ganjuwa (Filin-Shagari and Marbini); and in the Western zone; Toro (Tilde and Ganye); Kirfi (Badaraand Baba) and Dass (Dabandak and Wandu).

Two markets were selected from each zone. These markets were Jama'are and Misau in the northern zone; Cheledi and Toro in the Western zone while Ningi and Soro were from Central zone. In addition, Muda-Lawal market was also chosen being a collection centre for fresh tomato in Bauchi State. A list of both small scale tomato farmers (1,524) wholesaler (105) and retailers (1,278) were obtained and used as the sampling frame. This was achieved with the help of some key informants such as government officials from various B.S.A.D.P zones in Bauchi State and from leaders of tomato farmers and marketers association. Thus, 20% of both farmers and retailers from the selected areas were chosen, this gave the total number of 301 farmers and 252 retailers from the sampling frame of 1,524 and 1,278, respectively. All 105 of identified wholesalers in the three zones were selected for the study. This was because their population was considered not very large. Five retailers from each selected markets were identified based on volume of trade. From each retailer four consumers were selected and interviewed at the point of purchase of fresh tomato. The number of cooperating and non-cooperating consumers made up the sampling frame. Muda-Lawal market served as the collection centre for fresh tomato commodity and also has large number of different categories of fresh tomato consumers; hence, six consumers were selected from the five retailers and interviewed at the point of purchase of fresh tomato using accidental sampling procedure. This gave the total number of 150 consumers. In all, 808 respondents were randomly selected and interviewed for the study.

Methods of Data Collection

Primary data were collected from a field survey. Information pertaining membership of cooperative societies, strategies to stay in tomato business, point of purchase/ selling quantity harvested and/or marketed were obtained and use for the study. The data were collected with the help of some trained enumerators guided by the researcher. The trained enumerators were obtained from the various ADP headquarters of each selected LGAs. The data were collected over the period of 12 months (multiple visits).



Method of Data Analysis

Data were analysed using descriptive statistics such as frequency distribution, and percentages only.

RESULTS AND DISCUSSION

Membership of Cooperatives and Strategies to Stay in Farm Business

Membership of cooperatives

Table 1 compared the supply actors with regards to belonging to any social group or not. The result shows that 69.10% of producers, 94.29% of wholesalers and 80.56% of retailers were members of a cooperative society. The implication is that supply chain actors in Bauchi state were aware of the benefits of joining a cooperative society. These benefits include access to farming and marketing information. James *et al.* (2017) and Manu *et al.* (2017) reported 92.5% and 66.7% respectively to belong to cooperative society in vegetable marketing and production in Gombe and Kano States. Olajide and Oyeboode (2014) suggested the need for belonging to an organization by the farmers. This is because collective efforts might serve as a catalyst in motivating members towards a positive decision making.

Strategy to reduce transportation cost

Table 1 reveals the result on strategies used by tomato supply chain actors to reduce transportation cost. The result shows that 35.67% of producers use regular customers, 27.32% utilized the opportunity of empty vehicles heading to destination of sale of tomato, 23.00% used collective transportation with other farmers and 14.00% used carts as a strategy to reduce cost of transportation. About 44.68% of the Wholesalers used collective transportation, 38.9% used old customers and 20.48% used empty vehicles heading to their destination. Also the result of retailers on strategies to reduce cost of transportation shows that 58.78% used collective transportation, 26.30% used old customers, 13.00% used empty vehicles heading to their destination and 3.00% used carts. Saurav and Neeraj (2015) reported used of collective transportation and empty vehicles heading to intended destination as strategies to reducing cost of transportation for vegetable and fruit supply chain in India.

Strategies to stay in tomato business

Also, strategies utilized by supply chain actors to stay in fresh tomato business are presented in Table 1. The result reveals that 31.75%, 29.21% and 16.14% of the producers used multiple productions, drying of tomato, used disease free seeds and *Asusu* respectively to stay in tomato farming. The result also shows that 25.18%, 19.66% and 4.80% of the Wholesalers used multiple trades, buy small and sell, reduce product price, *Asusu* and dry tomato were the strategies used to stay in the business. Retailers used multiple trade (25.78%), reduce product price (25.87%) buy small and sell (22.17%) used *Asusu* (19.66%) and dry tomato (4.80%) to stay in the fresh tomato marketing.

Point of buying and selling of tomato

Again Table 1 reveals that 48.94% of Producers sell their product at the farm gate, 33.98% at rural markets, and 17.07% at urban market. The result also shows that 35.64% of Wholesalers buy at farm gate, 32.64% from rural markets and 28.72% at urban markets. Similarly Retailers buy at farm gates (30.42%). Majority (40.27%) of consumers buy tomato at urban markets, 39.60% from street hawkers and 13.42% rural markets. Consumers' preference to buy from street hawkers could be associated with them wanting to reduce cost of transportation energy and time management reasons.



Table 1: Membership of Cooperation and Strategies to Stay in Farm Business in Bauchi state.

Variables	Producers		Wholesaler		Retailers		Consumer		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Membership of cooperation										
Yes	208	69.10	99	94.29	203	80.56	0.0	0.0	510	77.50
No	93	30.90	6	5.71	49	17.44	0.0	0.0	148	22.49
Strategies to Reduce transport cost										
Use of collection transport	190	23.00	105	44.68	252	58.78	0.0	0.0	547	22.33
Use carts	116	14.00	0	0.00	118	3.00	0.0	0.0	234	9.55
Empty vehicles heading to Destination	224	27.32	48	20.48	69	13.00	0.0	0.0	341	13.92
Use of old customers	295	35.67	820	38.9	212	26.30	0.0	0.0	1327	54.18
Strategies to stay in Business										
Multiple production/ trade	301	31.75	105	25.18	252	25.78	0.0	0.0	658	28.72
Buy small and Sell	0	0.0	105	25.18	216	22.17	0.0	0.0	321	14.01
Use of disease free seeds	218	22.99	0	0.0	0	0.0	0.0	0.0	218	9.51
Reduce product price	0	0.0	105	25.18	252	25.78	0.0	0.0	357	15.58
Dry tomato	277	29.21	20	4.80	67	6.89	0.0	0.0	364	15.88
Asusu	154	16.14	32	19.66	187	19.70	0.0	0.0	373	16.28
Point of buying/selling										
Farm gate	301	48.94	103	35.64	167	30.42	10	6.71	581	36.26
Urban markets	105	17.07	83	28.72	168	30.65	59	39.60	415	25.90
Rural market	209	33.98	103	32.64	213	38.90	20	13.42	545	34.01
Street hawking	0	0.0	0	0.0	0	0.0	61	39.60	61	3.80

Source: Field survey 2017

Quantity Produced, Marketed and the Prices of Tomato by Producers and Marketers in Bauchi State

Quantity handled in baskets

It can be deduced from the result (Table 2) that 10.8%, 91.4% and 100% of producers, wholesalers and retailers, respectively, handled between 1-300 baskets of tomato. About 43.3% of the producers handled between 501 and above 900 baskets. This implies that 100% of retailers of fresh tomato buy below 301 baskets of tomatoes. Price of tomato per basket was also revealed. The result reveals that 28.9%, 47.6 and 0.8% of producers, wholesalers and retailers sold a basket of tomato at less than ₦ 500- ₦ 600, 15.9%, 9.5% and 1.6% of producers, wholesalers and retailers sold their tomato at ₦ 601-₦ 700. About 35.9% of the Producers, 21.0% of the wholesalers and 10.0% of the retailers sold theirs at ₦ 701- ₦ 800, 19.3% of producers, 21.9% of wholesalers and 93.7% of the retailers sold theirs at ₦ 800 and above per baskets. The implication is that retailer's sale at higher price compared to producers and wholesalers. Comparing producers and wholesalers, the result indicates that about (35.9%) of the producers sold at higher prices than the wholesalers.

Table 2: Distribution of Supply Chain Actors by Quantity (kg) Handled and Price in Bauchi State

Variables	Producers		Wholesaler		Retailers		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq	%
Quantity handled (basket)								
1-300	32	10.8	96	91.4	252	100	380	58.37
301-500	129	43.9	9	8.6	0	0	138	21.04
501-700	84	28.6	0	0	0	0	84	12.90
701-900	26	83.9	0	0	0	0	26	3.99
Above 900	23	7.8	0	0	0	0	23	3.53
Price /N/Basket								
Less Than N 500 - N 600	87	28.9	50	47.6	2	0.8	139	21.12
N 601- N 700	48	15.9	10	9.5	4	1.6	62	9.42
N 701- N 800	108	35.9	22	21.0	10	4.0	140	21.27
Above N 800	58	19.3	23	21.9	236	93.7	317	68.17

Basket = 49.41kg

Source: Field survey 2017

Buyers and sellers of fresh tomato

The result reveals in Table 3 that 22.81% of the tomato produced is sold to wholesalers, 10.41% to retailers and 0.11% to consumers. This implies that most buyers of fresh tomato from the Producers were bulk buyers. Furthermore, the result also indicates that 17.61% of the tomato was sold by commission agents, 15.73% were sold by rural assemblers and 33.33% were sold to outside Bauchi state wholesalers. The implication is that very negligible percentage of consumer goes to buy from producers. This could be because farmers prefer those that buy in bulk than in beats. It also indicates that major buyers of tomato from producers were retailers and wholesalers. Haruna *et al.* (2012) also reputed that retailers and wholesaler are market intermediaries for fresh tomato market in Bauchi metropolis The finding confirms the report of Nonyelu (2013) who stated that agricultural produces do not work alone in the creation of values for consumers but instead give some of their activities to channel workers. This also justifies Philips and Gary (2013) who stated that farmers are offered more than what they can achieve on their own. Also the chi-square result shows positive and significant relationship between source of seed, cost of raising seedlings, revenue from raising seedling, labour type, buyers of tomato and the net income obtained by the producers.

Table 3: Distribution of Fresh Tomato Producers by Their Buyers and Sellers in Bauchi State

Variables	Freq.	%
Buyers of tomato		
Wholesalers	206	22.81
Retailers	94	10.41
Consumers s	1	0.11
Assemblers (Farmers)	142	15.73
Total	443	
Sellers of tomato		
Commission agents	159	17.61
Outside dealers	301	33.33

Basket = 49.41kg

Source: Field survey 2017

CONCLUSION AND RECOMMENDATION

The study concluded that Supply chain actors used multiple productions, drying of tomato, used disease free seeds and *Asusu* as strategies to stay in tomato farming. in addition, SCA use one form of strategy to reduce cost of transportation and or to stay in business.

Based on the findings of the study the following recommendations are made:



- i. Both producers and marketers of fresh tomato, under the umbrella of cooperative societies, larger vehicles. This will also help in reducing the cost of transportation. When the cost of transport is reduced, marketers will be able to sell to consumers at affordable prices and also the product will reach consumers in the right condition.
- ii. Government should provide good roads that will link fresh tomato producing areas with markets to help Producers dispose of their products.
- iii. Also, there is need for adequate market with stable prices for tomato in addition to processing to ensure availability of tomato year round. This can be achieved through the exchange of market information among states, green houses, storage and processing facilities.

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