talenta PUBLISHER

InJAR
Indonesian Journal of Agricultural Research
Journal homepage: https://injar.usu.ac.id

Analysis of marketing efficiency and margin of tomatoes in Sabon Gari LGA, Kaduna State, Nigeria

Makama Saleh Aliyu[1*], Usman Musa Yagba[2], Magaji Bashiru Dahiru[2]
[1] *Agricultural Economics and Extension Department, National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria*
[2] *Department of Agricultural Economics, Faculty of Agriculture, Ahmadu Bello University, Zaria*
[*]Corresponding author: samakama@abu.edu.ng

ARTICLE INFO
Article history:
Received 13-12-2023
Revised 18-01-2025
Accepted 21-03-2025
Available online 27-03-2025

E-ISSN: 2615-5842
P-ISSN: 2622-7681

How to cite:
S. A. Makama, Usman M. Y., and Magaji B. D., "Analysis of marketing efficiency and margin of tomatoes in Sabon Gari LGA, Kaduna State, Nigeria", *Indonesian J. Agric. Res*, vol. 8, no. 1, pp. 17-22, Mar. 2025.

http://doi.org/10.32734/injar.v8i1.14755

ABSTRACT
The study evaluates the marketing margin and efficiency of tomato marketing in Sabon Gari Local Government Area, Kaduna State, Nigeria, where tomatoes are a crucial agricultural product. Despite being the second-largest tomato producer globally, Nigeria's tomato marketing faces challenges such as seasonality and perishability, with insufficient government support for marketing facilities. It's against this backdrop that the study attempted to determine the marketing margin and efficiency of tomatoes and to identify the tomato marketing constraints in the study area. A multistage sampling method was used to select the respondents. In the first stage, two vegetable markets were purposefully chosen based on the level of patronage they received. The second stage involved a random selection of 20% of the total traders from a list of traders obtained from their association thus making a total of 100 respondents from the two markets. Data were analyzed using basic statistical techniques viz, mean, percentage, and frequency table. Findings revealed that producers received 96.77% and 94.65% of sales in Samaru and Sabo-Gari markets, while wholesalers and retailers received only 1.09% and 3.31%, respectively. The marketing efficiency was notably higher in Sabon-Gari (114.88%) compared to Samaru (35.66%). Major constraints to tomato marketing were perishability, high input costs, and price swings. To enhance efficiency, the study recommends educating Samaru marketers on value addition and improving logistical support, such as timely input delivery, and better storage and transportation facilities.
Keywords: efficiency, marketing, margin, tomatoes

1. Introduction

Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed the world population by 2050. Its growth is centered more on raising incomes among the poorest than other sectors. Agriculture can help reduce poverty, boost income, and improve the food security of about 80% of the world's poor [1]. An increase in agricultural productivity is closely linked to marketability. An efficient market not only connects sellers and buyers based on supply and demand but also actively stimulates the consumption of outputs, which is crucial for economic development. This dynamic relationship highlights the importance of robust marketing systems in enhancing agricultural productivity and ensuring that food reaches consumers effectively [2]. Among the wide range of crops, vegetable occupies an important place because of their economic potential. The term "vegetables" applies to those plant parts that are edible, especially leafy or fleshy parts that are usually taken by humans as well as animals that serve as main sources and or supplementary foods in cooked or raw form. It is estimated that there are at least ten thousand (10,000) plant species used as vegetables worldwide, although only about fifty (50) are of commercial value [3].

Indonesian Journal of Agricultural Research Vol. 08, No. 01 (2025) 17 – 22

Vegetables play an important role in human nutrition; they contain vitamins, minerals, and chemical compounds that are essential for human health. In addition to providing smallholder farmers with greater incomes and jobs per hectare than basic crops, the production and marketing of vegetables hire people in both rural and urban areas [4]. Tomato (*Solanum lycopersicum*) is a member of the family *Solanaceae* and is among the most widely grown vegetables worldwide. It was domesticated in pre-Columbian times in Mexico or Peru and introduced into Europe shortly after the Spanish conquest of Mexico in 1521[5]. Subsequently, it was introduced to Africa through Gibraltar and Morocco [6].

It forms its dominance in Nigeria among many other crops as a result of its wide range of uses. It is considered a fruit in some circles and a vegetable in others. Tomatoes stand out as the most vital vegetable amongst the vegetables grown in Nigeria, in both the scale of production and level of consumption [7]. Tomato is mostly grown by smallholder dry-season farmers who cultivate between 0.5 and 2 hectares of land and consider it a primary endeavor crop. As one of the most important vegetable crops, its production and marketing will employ a large number of people. Tomato can grow under tropical climatic conditions, it can grow in temperatures of 10°C to 30°C however, the optimum growing temperature for tomatoes is 20°C – 28°C, though some varieties of tomatoes that are heat tolerant can still do well in very hot temperatures. It also grows well in well-structured soils with a pH of 5.5 – 6.5. If the soil is too acidic, it should be amended with limestone [8].

The world's tomato production in 2021 stands at over 189 million tonnes of tomato from about 5.16 million hectares of land [9]. In Nigeria, the crop is cultivated in almost all the agroecological zones with an estimated annual production of 3.47 million tones cultivated in over 1.6 million hectares of land with an average yield of 2.16 tones per hectare. [9]. The use of tomatoes is about 19.8 percent of the average daily consumption of vegetables in Nigeria [10]. The use of tomatoes is about 19.8 percent of the average daily consumption of vegetables in Nigeria [11].

Although Nigeria is ranked the second largest producer of tomatoes in Africa and tenth in the world, the country is still an importer of tomatoes as well, importing about 150,000 tonnes of tomato paste concentrate annually, making it the 13th largest importer of tomato paste globally and third in Africa and the largest importer of the product in West Africa [12]. It is clear, however that tomato marketing is characterized mainly by the problem of seasonality and perishability amongst others. Worst still, is the fact that the government of Nigeria pay more attention to production with little attention to marketing vegetables in general and tomato in particular despite the need for special marketing facilities for this type of produce. Consequent to the lack of these special marketing facilities, losses of about 40-50 percent occur for many vegetables. Also, with an increase in the production of tomatoes in the country, the lack of market information on prices is greatly affecting its marketing and thus, resulting in poor marketing efficiency. For consumers to get this product in the right form, time, and place, the marketing system of this product has to be free from all sorts of inefficiencies. Given the above, this study attempted to provide answers to the research questions: what is the marketing margin and efficiency of tomatoes in the study area? and what are the constraints bedeviling tomato marketing in the study area?

The broad objective of this study is to examine the marketing of tomatoes in Sabon Gari Local Government of Kaduna state, while the specific objectives are to: Determine the marketing margins and efficiency of tomato marketing in the study area, as well as to identify the constraints affecting tomatoes marketing in the study area. Hence, the study examined tomato marketing efficiencies, margins, and associated constraints. It aims to improve efficiency by providing solutions to the marketing problems of this valuable vegetable crop. Thus, our study is guided by the following hypothesis: marketing margins do not significantly influence tomato marketing in the study location.

2. Method

The study was conducted in Sabon Gari LGA of Kaduna state. Sabon Gari LGA is located in Kaduna state on Latitude 11^0N to 12^0N and Longitude 7^0E to 8^0E of the equator. The area has an average altitude of 640m and a population of 408,198 based on the 2006 census [13].

The area lies in the northern Guinea savannah ecological zone with savannah woodland vegetation and underlying grass species. The area's climate is characterized by distinct seasons, which are wet and dry seasons. The annual rainfall in the study area ranges from 1000mm to 1300mm, with an average rainfall of

Indonesian Journal of Agricultural Research Vol. 08, No. 01 (2025) 17 – 22

110 mm and it normally has a duration of about 5 months, beginning in May and ending around October. Dry season farming is being practiced under an irrigation farming system. The average temperature is about 30°C to 35°C during the rainy season and 35°C to 40°C during the dry season. Sabon Gari Local Government has twelve districts, predominantly occupied by the Hausa tribe majority of whom are Muslims by religion. The major occupation of the people in the area is usually farming and trading. Some of the major crops grown include: maize, sorghum, cowpea, groundnut, soybeans and sugarcane, tomato, onion, cabbage, and pepper, among others. The major livestock kept are goats, sheep, cattle, and poultry.

2.1. Sampling procedure

A multistage sampling technique was employed for the study. In the first stage, two major vegetable markets out of three (3) markets in the LGA were purposively selected. These markets were selected based on the fact that they are the major markets where vegetables are traded most and where tomatoes are assembled most within Sabon Gari LGA, coupled with the fact that they are the markets where tomato traders can be found. In the second stage, respondents were identified through their association, and thus 20% of the total traders were randomly selected from a list of traders obtained from their association. The respondents comprise 30 producers, 30 wholesalers, and 40 retailers. below is the table representing the population and sample size for the tomato traders in the selected market in the study area.

Table 1. Population and sample size of tomato marketers in the study area

Markets	Producer population	Sample size	Wholesalers population	Sample size	Retailers population	Sample size
Sabon-Gari	102	20	100	20	125	25
Samaru	50	10	51	10	75	15
Total	152	30	151	30	200	40

2.2. Method of data collection

Primary Data was used for this study. The primary data was obtained from the respondents through the administration of a well-structured questionnaire. Some of the information collected were: the age of the respondent, marital status, experience of the respondent, household size, occupational status of the respondent cost, and revenue among others.

2.3. Data analysis

Data were analyzed using descriptive statistics, marketing margin, and marketing efficiency. A descriptive statistical tool (such as frequency distribution tables, mean, and percentages) was used to analyze the data. While margin and efficiency were used as below, Marketing margin refers to the difference between the amount consumers paid for the product and the amount producers received. It can be expressed mathematically using the following formula [14]:

$$\text{Main marketing margin} = \frac{conumer\ price - producer\ price}{consumer\ price} \times 100 \quad (1)$$

$$\text{Producer marketing margin} = \frac{farm\ price}{retaiers\ price} \times 100 \quad (2)$$

$$\text{Wholesaler marketing margin} = \frac{wholsalers\ price - producers\ price}{retailers\ price} \times 100 \quad (3)$$

$$\text{Retailer marketing margin} = \frac{retailers\ price - wholesalers\ price}{retailers\ price} \times 100 \quad (4)$$

Marketing efficiency, on the other hand, is the maximization of the ratio of marketing input to output. Marketing input includes the resources used in providing marketing services, and marketing output includes the forms, place, and time utilities that the consumer derives from the marketing of products.

Marketing Efficiency can be expressed mathematically using the [14] method:

$$\text{Marketing Efficiency} = \frac{value\ added\ by\ marketing}{cost\ of\ marketing\ services} \times 100 \quad (5)$$

Indonesian Journal of Agricultural Research Vol. 08, No. 01 (2025) 17 – 22

3. Results and Discussion

3.1. Marketing margin

The compensation and determination of the marketing margin of tomato traders for the Samaru and Sabon Gari markets are shown in Table 2. Results from the Table showed that producers in Sabon-Gari's market had a marketing margin of 94.65%, wholesalers had 3.31%, retailers had 2.05%, and the cost of marketing services of that market was found to be 1.26%. For the second market (i.e., Samaru market), on the other hand, results showed that producers had a marketing margin of 96.77%, while wholesale had 1.09%, retailers had 2.15%, and the cost of marketing services was found to be 1.20%. This is in agreement with the findings of Bila and Bulama [15] in their study on Marketing Efficiency: A case study of Maiduguri Market, Borno State, Nigeria, where they reported Cattle fatteners to have the highest marketing margin of 77.2%. As a whole, the Sabon-Gari market had a marketing margin of 5.36%, while the Samaru market had a margin of 3.24%. This indicated that the producers have the highest consumer expenditure than the wholesalers and the retailers, which could be a result of the high costs incurred in the farming activities. Sabon-Gari market has a higher marketing margin (5.35%) than the Samaru market (3.24%). This could be a result of the fact that the Sabon-Gari market used to have more customer patronage than Samaru. This disagrees with the findings of [15], who reported in their study on the Analysis of marketing efficiency of shallot (*Allium ascalonicum L*.) in Karanganyar Regency that retailers have the highest margin of 22.85%.

Table 2. Marketing margin per basket of tomato in Sabon-Gari L.G.A. in percentage (%)

Market participant	Margin for Sabon-Gari market (N)	Margin (%)	Margin for Samaru market (N)	Margin (%)
Producers	25612.50	94.65	24859.18	96.77
Wholesalers	26507.47	3.31	25138.44	1.09
Retailers	27061.22	2.05	25690.48	2.15
Marketing service cost	674.20	1.26	612.76	1.20

Source: field survey, 2022

The result in Table 3 showed the generalized marketing margin obtained from the combination of the two markets (The two markets pooled together). The producers' margin was 95.47%, the wholesale price margin was 2.35%, and the retailer's share of margin, i.e., the price at which the commodity is sold, was 2.18%. However, the findings showed that the producers' marketing margin of 95.47% was greater than the retail share/cost of 2.18% and the wholesale price of 2.35%. Hence, the combination of both market performances gives an overall Marketing margin of 4.53%.

Table 3. Marketing margin for both the Sabon-Gari and Samaru markets

Market participant	Margin for Sabon-Gari and Samaru markets (N)	Margin (%)
Producers	25231.96	95.47
Wholesalers	25852.09	2.35
Retailers	26428.57	2.18
Marketing service cost	641.71	1.23

Source: field survey, 2022

3.2. Marketing efficiency

Marketing efficiency in the agricultural industry is the most frequently used measure of market performance. Efficiency is an engineering terminology used to measure the ratio of output to input. The result of the marketing efficiency is presented in Table 4. The findings from the results showed that the marketing efficiency for the Sabon-Gari market was found to be 114.88%, while that of the Samaru market was 35.66%. This implies that the Sabon-Gari market, having a marketing efficiency of 114.88% was more efficient than the Samaru market with a marketing efficiency of 35.66%. The marketing efficiencies of the Sabon-Gari and Samaru Markets were respectively higher and lower than those obtained by Bila and Bulama [14].

Indonesian Journal of Agricultural Research Vol. 08, No. 01 (2025) 17 – 22

Table 4. Marketing efficiency for tomato marketing in Sabon Gari and Samuru market

Market activities	Sabon-Gari markets	Samaru market
Cost of marketing service	674.20	612. 76
Value added	774.52	218.54
Marketing efficiency (%)	114.88	35.66

3.3. Tomato marketing constraints

Problems faced by tomato marketers/traders in the study area were ranked according to their severity as can be seen in Table 5. Perishability was reported as the most serious problem with the majority of the respondents (50%) attesting to this fact. This could be due to the fact that, a cold storage facility is lacking in the area and even when available, electricity becomes an issue. High cost of inputs was ranked second which could be based on the reason that inputs such as fertilizer are not provided by the government at a subsidized rate and even when subsidized, it is not provided at the right time. Poor transportation was ranked third this could be attributed to poor road conditions thus, leading to high transport costs. Insufficient capital which was ranked 4th could be as a result of the fact that majority have little or no access to loan and therefore, solely depends on personal saving to fund the farming enterprise. Price fluctuation is another constraint bedabbling tomato marketing in the study area and could be as a result of the poor marketing system and function that leds to several setbacks in tomato production and lastly, competition the least constraint among the constraints bedabbling tomato marketers in the study area. Findings of this study on tomato marketing constraints corroborates that of Tosin [16] in his study on tomato marketing in Ilorin metropolis of Kwara state which showed that the major problems of the marketers were; inadequate market infrastructure, transportation problem, inadequate capital, shortage of processing facilities as well as the seasonality and perishability of the product.

Table 5. Tomato marketing constraints of the respondents

Constraints	**Frequency**	**Percentage**	**Ranking**
Insufficient Capital	5	5	4th
Competition	2	2	6th
High input cost	29	29	2nd
Insufficient space	2	2	6th
Perishability	50	50	1st
Poor Transportation	9	9	3rd
Price Fluctuations	3	3	5th

4. Conclusion

Based on the results, it was concluded that the Sabon Gari market is more efficient than the Samaru market. Hence, the Sabon Gari market had a marketing efficiency of 114.88 while the Samaru market had a marketing efficiency of 35.66 thus poor market performance. Thus, the study recommended that marketers/traders in the Samaru Market be enlightened on the importance of value addition to their products. Also, timely delivery of input, and provision of adequate storage, as well as transport facilities by the government and private organizations to enhance the evacuation and proper distribution of tomatoes.

References

[1] World Bank, “Food and Agriculture: Overview,” November 2023, [online]. Available: https://www.worldbank.org/oen/topic/agriculture/overview.

[2] U. Haruna, M. H. Sani, H. A. Danwanka, and E. Adejo, “Economic analysis of fresh tomato marketers in Bauchi Metropolis of Bauchi State, Nigeria,” *Nigeria Journal of Agriculture, Food and Environment*, vol.8, no.3, pp 1-8, 2012.

[3] J. T. Shing-jy and L. Hsiao-Feng, “Vegetable: Type and Biology,” in Handbook for vegetable preservation and processing Y. H. Hui, Sue Ghazala, Dee M. Graham, K. D. Murrell, and Wai-Kit Eds., New York, NY, USA: CRC Press, pp.1-25, 2003.

[4] A. H. Adenuga, S. B. Fakayode, and R. A. Adewole, "Marketing efficiency and determinants of marketable surplus in vegetable production in Kwara State, Nigeria," in 4th ICAAAE (Hammamet, Tunusia), (September, 22-25), pp 1-15, 2013.
[5] C. Gebhardt, "The historical role of species from the solanaceae plant family in genetic research," *TAG. Theoretical and applied genetics, Theoretische und angewandte Genetik*, vol. 129, no. 12, pp. 2281–2294, 2016. Available: https://doi.org/10.1007/s00122-016-2804-1
[6] H. M. Isa, A. A. Manga, and M. A. Hussaini, "Response of tomato (Solanum lycopersicon L.) to antitranspirants and moisture stress in Kano, Sudan Savannah of Nigeria," *Journal of Dryland Agriculture*, vol. 3, no. 1, pp. 48 – 58, 2017.
[7] A. O. Adejobi, R. O. Babatunde, and E. O. Idowu, "Weight and measurement issues in retail market of fresh tomatoes: evidence from Osun State," *Journal of Agricultural Science*, vol. 6, no. 4, pp. 20-26, 2011.
[8] Veggieconcept, "Tomato Farming in Nigeria: A Complete Guide" July 2020 [Online]. Available: https://veggieconcept.ng/tomato-farming-in-nigeria/.
[9] B. François-Xavier, "Worldwide (total fresh) tomato production in 2021" , https://www.tomatonews.com/en/worldwide-total-fresh-tomato-production-in-2021_2_1911.html (accessed, Aug. 18, 2023).
[10] FAOSTAT, "FAOSTAT," 2023. Available: https://www.fao.org/faostat.
[11] National Agricultural Extension and Research Liaison Services (NAERLS), "Agricultural Performance Survey Reports," 2011. Available: https://naerls.gov.ng/reports/.
[12] O. A. Taiwo, "Economic analysis of tomato marketing in Ondo State, Nigeria," *Journal of Horticultural Science*, vol. 6, no. 2, pp. 2581-2586, 2020.
[13] National Population Commission NPC, "2006 Census" Headquarters Block 14 Lulu's Street PMB 281, Abuja Nigeria.
[14] Y. Bila and Y. Bulama, "Marketing efficiency: A case study of maiduguri cattle market, Borno State Nigeria," *Global Journal of Pure and Applied Sciences*, vol. 13, no. 1, pp. 7-12, 2007.
[15] Setyowati, E. S. Rahayu, H. Irianto, and J. Sutrisno, "Analysis of marketing efficiency of shallot (Allium ascalonicum L.) in Karanganyar Regency," *IOP Conf. Series: Earth and Environmental Science*, vol 905 p012056, 2021.
[16] Y. S. Tosin, "Analysis of Tomato Marketing in Ilorin Metropolis of Kwara State: Case Study of Ilorin Metropolis of Kwara State," An unpublished project of the Department of Agricultural Economics and Extension Technology, School of Agriculture and Agricultural Technology, Federal University of Technology Minna, Niger state, 2018.