



Research Article

Analysis of the Structure and Conduct of Watermelon Marketing in Ibarapa Central Local Government Area of Oyo State

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Abstract

This study was carried out to analyze the structure and conduct of watermelon marketing in Ibarapa Central Local Government Area of Oyo State. Specific objectives of the study include to describe the socio-economic characteristics of watermelon marketers, examine the marketing margin and marketing efficiency of marketers in the study area. Multi-stage sampling technique was employed to select 95 marketers. Primary data were collected using a set of well-structured questionnaire. Data were analyzed using descriptive statistics, Gini coefficient model and marketing efficiency index. The result of the study shows that 57.9% of the marketers were male, 41.1% were married, Gini Coefficient result of 0.56 indicated a moderate concentration of watermelon marketers. Market Efficiency Index of 2.43 revealed a high level of efficiency in the market. Inadequate shed and price fluctuation were among the major constraints identified in the study area. It was therefore recommended that Local Government Authority in the area should as a matter of urgency construct sets of buildings to serve as store or shop which will be made available at affordable prices to the marketers.

Keywords: Watermelon, Marketing Margin, Efficiency and Ibarapa

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Introduction

The recent global food and economic crisis have propelled the crusade and outcry for agricultural sector reform especially in the agricultural marketing value chain. Nigeria, like most developing nations of the world, is not left out in this global campaign for

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improvement in agricultural production and efficient agricultural marketing (Acharya and Agarwal, 1999). More worrisome is the fact that Nigeria; being the most populous black nation in the world, its rapid population increase does not enjoy corresponding rate of increase in local food supply. Furthermore, the few produced foods are not effectively and efficiently distributed due majorly to the poor performance of the marketing system (Onyemauwa, 2010).

The food demand far outstripped the level of supply which is creating an immense pressure on the teeming populations, resulting in further food crisis in the country. The agricultural products in the country especially fruits and vegetables if effectively harnessed and distributed nationwide through an efficient marketing processes in the form, place and time needed can help curb the menace of food insecurity on the populace. Marketing is one of the vital aspects of agriculture since agriculture entails the production of goods and services, and production is not completed until the commodity produced reaches the final consumers.

Watermelon (*Citrullus lanatus*) is a member of the cucurbit family commonly referred to as Cucurbitaceae (Huh, Solmaz and Sari, 2008); a warm-season crop related to cantaloupe, squash, cucumber and pumpkin (Georage, Darbie and Kelley, 2000). It is an important horticultural crop, mostly known for its sweet and juicy fruit, grown commercially in areas with long frost-free warm climates all over the world (Jeffrey, 2001; Prohens and Nuez, 2008). Baba, Yelwa and Sanchi (2014) reported that watermelon global consumption is greater than that of any other cucurbit. It is highly relished as a fresh fruit in different parts of the world because of its thirst quenching attribute in addition to many other identified nutritional values and advantages (Ajewole, 2015).

The consumption of the commodity in the recent times has witnessed remarkable development as it cuts across all socioeconomic classes. China is the leading producer of watermelon in the world; it provides one third of the total watermelons in the world, followed by Iran, Turkey, Brazil, Egypt, United States, Uzekistan, Algeria, Russia and Vietnam completes the top ten producers in the world (FAOSTAT, 2017). Nigeria is one of the leading producers of watermelon in Africa, and the largest production of the crop comes from the Northern part of country, where the suitable agro ecology is found (Okonmah, Agbogidi and Nwagu, 2011).

However, a reasonable quantity of the crop could still be grown in other agro-ecologies with intensive management and is still economically feasible (Bosede, Olubunmi and Balogun, 2012). Watermelon reaches consumers through the marketing system. Marketing is concerned with all stages of operation, which facilitate the movement of the

commodities from the farms to the consumers. Marketing has economic value because it gives form, time and place utility to products and services (Asogwa and Okwoche, 2012).

Therefore, increase in marketing activity of watermelon would enhance the provision of more and better produce at low price to increased number of people which would enable marketers to generate more income and increase welfare. The marketing channel of watermelon is an important part of its cost, and its location to the market may shorten the path of the distribution from producers to consumers and makes the marketing process simple and efficient (Egbuna, 2009). Efficiency in the marketing of watermelon is borne on the platter of an efficient market information provision (Oguntola, 2006). In fruit marketing, farmers and marketers determine the flow of information from the farm to the market place and this consequently influences the market performance.

The consumption of exotic vegetable including watermelon has been on the increase but the cost of carrying out various marketing functions have led to astronomical rise in price, so much so that some consumers have subsided in its consumption (Nya, Okorie and Eka, 2010). This is partly because most of the watermelon marketed in Southern parts of Nigeria are usually produced in the rural areas of northern Nigeria. The quantity of watermelon available for consumption and the price paid by the consumer depends on how efficient the marketing system of watermelon functions.

Watermelon marketers experience lots of problem in trying to meet demands due to fluctuation in supply. It is a perishable agricultural produce and cannot be stored over a long period of time. The high demand for this vegetable fruit is not met in the Southern part of Nigeria due to unfavourable climatic condition (Okonmah, Agbogidi and Nwagu, 2011).

Consequently, there have been increased trade and commerce activities surrounding these commodities. Watermelon has attracted very insignificant marketing research attention compared to other food and cash crops; this is due partly because it is regarded as a minor crop. Several studies have been conducted with respect to watermelon production in Africa. As regards the terms of price, there is considerable variability in watermelon prices within the year due mostly to seasonal changes in the volume of production. The distribution and availability of watermelon in Oyo State tends to be inadequate and inefficient as the product is rarely produced in the study area and its external influx could pose high cost of marketing on the product and implicitly the price of watermelon very exorbitant. In view of the rising demand for watermelon in the state in the face of inefficient marketing, therefore, it is pertinent and relevant to analyze the performance of the watermelon marketing in Oyo State, Nigeria.

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Watermelon marketing has a large potential to enhance agribusiness development, generate income and employment opportunities that will lead to significant impact in the rural sector particularly for households in the non-producing areas in Oyo State. Efficient performance of watermelon marketing is of great importance in Nigeria as it enhances self-sufficiency, thereby assisting in the availability of watermelon on and off seasons. Most often market operators negotiate the trading conditions, the payment is made in cash and the delivery is also immediate. The market narrowness, the lack of quality roads in some places, and the irregularity of the production systems make the marketing function more complex and thus show the importance of access to the appropriate information. Marketing of crops in Oyo state is challenged by inefficiency and ineffectiveness due to inadequate market infrastructure, transportation, and the pricing system (Onyemauwa, 2010). Watermelon marketing is profitable in Oyo state, but there is a need to understand how the product can be efficiently distributed to maximize economic returns to farmers and marketers (Kassali *et al.*, 2015).

The broad objective of the study is to analyze the structure and conduct of marketing watermelon in Ibarapa local government area of Oyo State. While the specific objectives are to; describe the socio-economic characteristics of watermelon marketers; examine the market structure and conducts of watermelon marketing; determine marketing margins and marketing efficiency of watermelon marketers; identify constraints militating against marketing of watermelon in the study area.

Methodology

The study was carried out in Ibarapa Central Local Government Area (LGA) of Oyo State, the LGA lies within the tropical zone in the rain forest region of southwestern Nigeria. The Local Government Area is bounded in the East by Ibarapa East Local Government, in the West and North by Ibarapa North Local Government and in the South by Ogun State. It is located on latitude 8.0" N and longitude 4.0" E. The average annual rainfall is 300mm and fairly high temperature. There are two distinct seasons, the first (raining) season commences from March and ends in October while the dry season starts in November and ends in February. The agro-ecological zones are suitable for the cultivation of tree crops and arable crops. Tree crops such as cocoa, oil palm, cashew and arable crops such as cassava, maize, yam and other vegetables are the common crops cultivated in the area. Ibarapa division is given the appellation of food basket of Oyo State, which makes it unique among the Local Governments of the Federation.

The Council is blessed with major markets among whom are Towobowo, Oba Market, Onilado, Ayeda, Ita-Agbe. Towobowo market which is one of the best among others in Ibarapa Division as a trade centre for other State like Lagos, Ogun, Oyo, Osun and Edo. The area is peculiar for horticultural crop production, and a large percentage of the inhabitants are farmers. The estimated population figure of Ibarapa central was 322,189 (NPC, 2018), with a geographical land mass of 440 km².

Multi-stage sampling technique was employed in selection of respondents for this study. Five markets were purposively selected in the first stage due to the substantial volume of watermelon marketing in these markets. In the second stage, a simple random selection of 20 marketers from the five major markets from the Local Government Area was done, giving a total number of hundred respondents that was used for this study. However, a total of 95 responses were suitable for analysis. Primary data was used for this study and the data was collected with the aid of a well-structured questionnaire. Data collected was centered on socio-economic characteristics of watermelon marketers, information on market structure and conduct of watermelon marketing, marketing margins and marketing efficiency of watermelon marketers and the constraints militating against watermelon marketing.

Data collected was analyzed using descriptive and inferential statistics such as frequency distribution this was used for the socio-economic characteristics of watermelon marketers. This will include charts, tables, estimation of mean, standard deviation and scenes. The Gini coefficient model was used to analyze the market structure and conduct of watermelon marketing in the study area. The value of the Gini coefficient lies between 0 and 1; where zero implies a perfect market with perfect equality and 1 implies a perfect inequality in the distribution of income, signifying an imperfect market. The closer the Gini coefficient is to zero, the greater the degree of equality and the lower the level of concentration and the more competitive are the markets (Anuebunwa, 2008). That is, the closer the value to unity, the greater the degree of inequality and therefore, the higher the level of concentration and vice versa. It is effective in determining the degree of concentration in agricultural commodity markets.

Mathematically, Gini coefficient (GC) is expressed as follow:

$$GC = 1 - \sum XY \dots\dots\dots(1)$$

Where:

X = the proportion of watermelon marketers,

Y = the cumulative proportion of total sales (income)

Σ = Summation sign.

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Marketing Margin Model was used to determine the marketing margins of watermelon marketers in the study area. Marketing margin for watermelon marketing refers to the difference between the price paid by the ultimate consumer and the price received by the watermelon farmer, or the difference between the producer price (farm gate price) and the retail price. Therefore in this study, the average prices of watermelon was used in the computation of marketing margins. The selling price and the purchase price was obtained using the average of the prices given by each respondent. The prices was summed and divided by number of respondents to obtain the grand mean. The marketing margin for this study was expressed as a percentage marketing margin as follows:

For Wholesalers:

$$\frac{\text{Wholesale selling price} - \text{Wholesale buying price}}{\text{Wholesale selling price}} \times \frac{100}{1} \quad \frac{\text{Wholesale selling price} - \text{Wholesale buying price}}{\text{Wholesale selling price}} \times \frac{100}{1}$$

.....(2)

For Retailers:

$$\frac{\text{Retail selling price} - \text{Retail buying price}}{\text{Retail selling price}} \times \frac{100}{1} \quad \frac{\text{Retail selling price} - \text{Retail buying price}}{\text{Retail selling price}} \times \frac{100}{1} \quad \text{.....(3)}$$

Marketing Efficiency Index was used to determine the marketing efficiency of watermelon marketers.

The Marketing Efficiency (ME) will be calculated following Shepherd Futrel Model indicated as:

$$\text{ME} = \frac{\text{Output of Marketing}}{\text{Input of Marketing}} \times \frac{100}{1} \quad \frac{\text{Output of Marketing}}{\text{Input of Marketing}} \times \frac{100}{1}$$

.....(4)

In line with Olukosi, Isitor and Ode (2005), output of marketing was proxied by net returns from marketing activities and input of marketing was proxied by cost of marketing activities. Therefore, marketing efficiency was expressed as:

$$\text{Percentage (\%) Marketing Efficiency} = \frac{\text{Net Marketing Returns}}{\text{Total Marketing Cost}} \times \frac{100}{1} \quad \frac{\text{Net Marketing Returns}}{\text{Total Marketing Cost}} \times \frac{100}{1}$$

.....(5)

If the marketing efficiency equals one, the marketing is efficient but if it is less than one, the market is inefficient. However, if the marketing efficient is greater than one the market is highly efficient. If expressed in percentage; then, 100% indicates very efficient while less than 100% shows inefficiency in the system.

The Likert scale rating techniques was used to examine the constraints militating against watermelon marketing in the study area. A likert scale is a psychometric scale in survey research. When responding to a likert questionnaire item, respondents specify their levels of agreement or disagreement on a symmetric agree - disagree scale for a series of item statement. The scale captures intensity of their feelings. A 4 - point rating scale was employed in this study. This was regarded as strongly agree (SA), agree (A), disagree (DA), and strongly disagree (SD), with corresponding values of 4, 3, 2, and 1 respectively.

The mean score (MS) of the respondents based on the 4-point rating scale was computed as cut off point. Based on this, any score below 2.50 ($MS < 2.50$) was taken as a weak factor and was not considered while those with mean score of above 2.50 ($MS > 2.50$) was taken as strong factors and thus be considered.

Results and Discussion

Table 1 shows that 41.1% of the respondents were between the age range of 36-45 years, 28.4% of the respondents were between 46-55 years, 23.2% of the respondents were between 26-35 years and 7.4% of the respondents were above 55 years. This implies that the watermelon marketers were in their active age and will be able to carry out their marketing activities efficiently and effectively. This is in support of the findings of Jatau and Shidiki (2012) which shows that farmers and marketers in their active age can influence the adoption of improved agricultural practices, which can equally influence a high level of watermelon marketing activity.

Furthermore, 57.9% of the respondents were male while 42.1% were female. This implies that watermelon marketing in the study area is dominated by men. This shows that male contribute a larger proportion of watermelon marketing and this could be attributed to few females being willing to take the risks of long-distance trips, transportation stress and other factors associated with sourcing the product from the northern part of the country. The result was in agreement with Isibor and Ugwumba (2014) who reported that male dominated watermelon market than the female. Table 1 also showed that 54.7% were married, 21.1% of the respondents are single, 13.7% are widowed and 10.5% are

Table 1: Socio Economic characteristics of Watermelon Marketers

Socio economic	Frequency	Percentage (%)
Age (Years)		
26-35	22	23.2
36 -45	39	41.1
46 -55	27	28.4
Above 55	7	7.4
Gender		
Male	55	57.9
Female	40	42.1
Marital Status		
Single	20	21.1
Married	52	54.7
Divorced	10	10.5
Widowed	13	13.7
Marketing Experience		
1-5	65	68.4
6-10	25	26.3
11-15	3	3.2
Above 15	2	2.1
Educational Level		
No Formal education	25	26.3
Primary Education	31	32.6
Secondary education	30	31.6
Tertiary education	9	9.5
Total	95	100.0

divorced and this implies that they had more family responsibilities. Marriage is generally regarded as an important factor in the livelihood and social wellbeing of an individual in our society as it is perceived to confer responsibility to an individuals. Ani (2015) opined that marriage has a direct relationship with family stability therefore the high percentage of married respondents. This suggested that the watermelon marketers were stable and able to make good business decisions. The results also shows that 68.4% of the respondents had 1-5 years of experience, 26.3% had 6-10 years of experience, 3.2% had 11-15 years of experience while 2.1% had above 15 years of experience. This implies that the marketers were experienced in their business and should therefore be able to carry out watermelon marketing through adhering to some precautions thereby helping in maximizing profit. This is in agreement with the findings of Ali *et al.*, (2008) who

reported that watermelon marketers in their findings had adequate marketing experience which implies that the experience will be useful in adopting new innovation. Ugwumba (2010) opined that education and experience are veritable tools for acquiring new ideas and skills that reflect positively on scope of enterprising, income and profit. Table 1 revealed that 32.6% of the respondents had primary education, 31.6% of the respondents had secondary education, while 26.3% of the respondents had no formal education. As reported by Amaza (2000), education has positive and significant impact on watermelon marketers' efficiency in marketing. This literacy level will greatly influence the decision making and adoption of innovation by marketers due to high exposures and knowledge required. By implication, a reasonable number of marketers in the area should be able to understand the use of improved technologies and apply it to achieve increased profitability in watermelon marketing.

Table 2: Distribution of Respondents According to Volume of Sales from Watermelon Per Week

Volume of sales	Number of marketers	Percentage of marketers (X)	Total of income from watermelon	Percentage of total income from sales	Cumulative percentage of total income from sale (Y)	XY
1 – 49	41	43.1	13520	27.7	27.7	0.12
50 – 99	20	21.0	12500	25.7	53.4	0.11
100 – 150	15	15.7	9500	19.5	72.9	0.11
151 – 199	10	10.5	7550	15.5	88.4	0.09
200 – 250	9	9.4	5590	11.5	100.0	0.09
Total	95	100.0	48,660	100.0	342.4	0.439
Gini Coefficient						0.561

Table 2 shows that the watermelon marketers had a Gini coefficient of 0.561. The results implied high levels of income inequalities sales margin in the distribution of income amongst watermelon marketers and high concentration of watermelon marketers in the study area. The inequality in the market could be as a result of variation in the investment level of respondents. The results might also be an indication that some marketers could influence watermelon market price. The results agreed with a watermelon marketing findings by Olumide (2015) in Akure metropolis which showed a Gini coefficient of 0.7318 signifying a high level of income inequality among the marketers.

Result of Marketing Margin Analysis

$$MM = \frac{SP - CP}{SP} \times \frac{100}{1} \quad (6)$$

$$\frac{67842 - 65952}{65952} \times \frac{100}{1}$$

$$\frac{1890}{65952} \times \frac{100}{1}$$

$$0.0286$$

$$= 2.865$$

This shows that 55.8% of the respondents were wholesalers and 44.2% of the respondents were retailers, it showed that there were no barriers to entry against potential entrants into the watermelon markets. All respondents indicated that marketers entered easily into the market, which indicated a tilt towards pure competitive market structure. On the perception of the size of watermelon marketers, result indicated that the number of wholesalers was significantly more than the retailers. Majority of the respondents indicated that the large capital outlay needed to start the business was the principal reason for the number of marketers at the wholesale level. This is not surprising, considering the long distance travelled by most of the wholesalers to purchase the product, huge transport cost and other marketing costs involved in moving the product from Northern States of Sokoto, Borno, Jigawa, Kano, Zamfara and Niger to the study area.

Marketing Efficiency Index

$$ME = \frac{\text{Output of marketing}}{\text{Input of marketing}} \times \frac{100}{1} \quad (7)$$

$$= \frac{161795}{66407} \times \frac{100}{1}$$

$$= 2.43$$

Based on the marketing efficiency index, if the marketing efficiency equals one or greater than one, the marketing is efficient but if it is less than one, the market is inefficient. The result has a high value of 2.43 which shows that the marketing system of watermelon was highly efficient in the study area.

Table 3: Likert Scale Rating

S/N	Challenges	Average Rating/Points	Degree Seriousness	of
1	Inadequate capital	2.07	Not serious	
2	Price fluctuation	2.57	Serious	
3	Inadequate storage facility	1.84	Not serious	
4	Inadequate shed or shop	2.61	Serious	
5	Insect infestation	1.81	Not serious	
6	High cost of transportation	2.39	Not serious	
7	Poor marketing channel	2.00	Not serious	
8	Distribution logistics	2.08	Not serious	
9	Too many involvement of middlemen	2.49	Not serious	
	Cut-off point/average	2.50		

Key:

1.00 – 2.49 Not serious

2.50 – 3.00 Serious

3.01 – 4.01 Very serious

Source: Field Survey, 2022.

Table 3 shows the constraints militating against efficient marketing of watermelon in the study area. The result shows that watermelon enterprise was bedeviled by many critical problems. It shows that some challenges were more pronounced in level of market. For instance, the result shows that and inadequate shed or shop (2.61) and price fluctuation (2.57) were the major challenges experienced by the marketers in the study area. This could be connected with the long distances travelled by the wholesalers to purchase the commodity in the northern parts of the country as well as the bad road networks. However, inadequate storage facility (1.84) and insect infestation (1.81) was reported as not major problems. The result could be attributed to the fact that majority of the retailers buy and resale in the same market and as such incurred less transportation and handling costs within the markets.

Conclusion

This study examine market performance of watermelon using Gini coefficient, market efficiency index and marketing margin analysis in Ibarapa Central Local Government Area of Oyo State. Despite the economic viability of the enterprise in the study area, it was observed that some levels of inefficiency abound. This is an indication that there exist potentials in watermelon marketing contributing positively to poverty alleviation especially in this period of economic recession in Nigeria. Inadequate shed or shop is a very serious constraint in the study area. Therefore, to ensure efficient and improved performance of watermelon marketing in Ibarapa Central Local Government Area of Oyo State, policies that will eliminate and address the marketing constraints should be formulated by government at various levels.

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

- i. Local Government Authority in the area should as a matter of urgency construct set of building to serve as store or shop which will be made available at affordable prices to the marketers. This will solve the problem of inadequate shed or shop among the marketers.
- ii. There is the need for the marketers to form a registered cooperative society that will help in price regulation; this will reduce price fluctuation as reported by the marketers.
- iii. There is the need for the marketers to form a watermelon marketing association to regulate the activities of the middlemen in the study area, which is another major constraints.

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