



## **FACTORS DETERMINING PROFIT IN WATER MELON (*Citrullus lanatus*) MARKETING IN GOMBE AND BAUCHI STATES, NIGERIA**

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### **ABSTRACT**

The study determine the factors influencing the net income of wholesale and retail water melon marketers in Gombe and Bauchi States, Nigeria. Multi-stage sampling technique was used to select 300 water melon marketers from 18 markets, 135 and 165 marketers were selected from Bauchi State and Gombe State, respectively. Data were collected using structured questionnaires. The regression analysis result revealed that retail Water melon marketers in scarcity period recorded the higher number of significant variables with the  $R^2$  value of 0.520 and F-statistics of 34.309 significant at  $P < 0.001$ . The wholesale, results indicated that surplus and scarcity periods gave the best results with only marketing costs and education having positive relationship with net income and significant at  $P < 0.05$  each. Conclusively, the socioeconomic variables of marketers at retail category were found to influence more in determining the net income of water melon marketers in the study area. It was recommended that that marketers should ensure to get less marketing cost to purchase large quantity of water melon at a minimum cost, hence, maximise profit in return.

**Keywords:** Costs, Net income, Wholesale, Retail, Scarcity.

### **INTRODUCTION**

Marketing has been described not just as selling goods and services, but it requires a clear and absolute understanding of what consumer want and the ability to deliver it to them through the most appropriate channels for a profit. It includes the planning, pricing, promotion and distribution of products and services for consumers, both present and potential (Katherine *et al.*, 2007). Mshelia *et al.* (2013) defined Agricultural marketing from the micro and macro point of view; the micro view point, agricultural marketing is defined as the performance of all business activities which direct the forward flow of goods and services from the initial point of production to ultimate consumers in order to accomplish their objectives. From the macro point of view, marketing examines the total system of economic activities concerned with the flow of agricultural products from producers to ultimate consumers, the kinds of institutions and the price making mechanisms that guide those flows, the interactions among consumers, agribusiness firms, farmers and even governments that determines the level farmers and even governments that determines the level of expenditure and the sharing of those expenditure as income to market participants.

Water melon (*Citrullus lanatus*) is one of the most important fruits cultivated in the tropics. It is consumed throughout the world and is mainly cultivated in the tropical countries. Water melon is good for all human consumption and livestock needs as it contains most of the basic daily nutritional requirements of the body and other essential nutrients that prevents human health problems like cancer, stroke, high blood pressure, heart attack and other cardiovascular disease. Watermelon could be eaten raw when it is fresh after being washed and



sliced into bits. It has preferably nutritional values to its consumers and supplied the body with low calories, lycopene which is an antioxidant that prevents cancer and other diseases, vitamin A, vitamin C, protein, carbohydrate, fibre, potassium, calcium, iron, fats and up to 92 mills of water. These are all necessary for good health and development of human and livestock needs. Hence, it is referred to as to the chief of the world's luxuries and king over all fruit of the earth (United States Department for Agriculture [USDA], 2002) in (Adamu *et al.*, 2015). The objective of the study therefore, was to determine the factors influencing the profit in wholesale and retail marketing of water melon in Gombe and Bauchi States, Nigeria.

## **MATERIALS AND METHODS**

### **The Study Area**

Gombe State lies between Latitudes 10<sup>0</sup> 16' and 11<sup>0</sup> 00'N and Longitudes 11<sup>0</sup> 00'E and 11<sup>0</sup> 11'E. It has a land area of 20,265 km<sup>2</sup> and a projected population of 3,159,693 people (Nigeria Population Census [NPC], 2006) census with a 2.8% annual growth rate of the population. The climatic condition of the state is characterised by two distinct seasons dry and wet. The wet season begins from April and ends in October, and the dry season starts in November and last up to March. The mean annual rainfall ranges from 600mm to 1200mm, with the minimum and maximum temperatures of 22.7<sup>0</sup>C and 33.5<sup>0</sup>C, respectively (Gombe State Economic Empowerment and Development Strategy [GOSEEDS], 2010). Bauchi State lies between Latitudes 10<sup>0</sup> 17' and 11<sup>0</sup> 00'N and Longitudes 9<sup>0</sup> 45' E and 11<sup>0</sup> 12'E. It has a land area of 49,119 km<sup>2</sup> and a projected population of 6, 16496 inhabitants (NPC, 2006) census with a 2.8 percent annual growth rate of the population (NPC, 2006). The climatic condition of the state is characterized by two distinct seasons dry and wet. The wet season begins from May and ends in September, and the dry season starts in October and lasts up to April with the mean annual rainfall that ranges from 600mm to 1300mm, while the temperature ranges from 18.5<sup>0</sup>C to 32<sup>0</sup>C as minimum and maximum, with April as the hottest and January as the coldest month respectively (Bauchi State Agricultural development Project [BSADP], 2009).

### **Sampling Technique and Data Collection**

Multi-stage sampling technique was used. Stage one involved the purposive selection of three (3) main local government Areas (LGAs) from Gombe and Bauchi States. The second stage involved purposive selection of three (3) markets from each Local government Area (LGA), making 18 markets and the last stage involved simple random selection of respondents from these markets. In all, 300 fruits vegetable marketers were randomly selected from a sample frame of 1,056 collected from the selected markets of the study area.

### **Method of Data Collection**

The data were collected from wholesale and retail water melon marketers using structured questionnaires. The data collection was done at different period's i.e (at different marketing seasons) where surplus period ranged from the months of September to December, balance period from May to August as well as scarcity period that ranged between Januarys to April of the year calendar.

### **Method of Data Analysis**

The Multiple regression analysis tools were used to determine factors influencing the net income in water melon marketing. The model in its general form is specified as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, U_i) \quad \dots(1)$$

where;

Y = Estimated net income of Sweet melon and Water melon marketers (₦),

X<sub>1</sub> = Age (years),

X<sub>2</sub> = Marital status (1 =single; 2= married; 3 = divorced and 4= widowed),



- X<sub>3</sub> = Family size (number),
- X<sub>4</sub> = Years of education attained (6 = primary; 12 = secondary; 15 = tertiary; 3 = Adult and 2= Qur'anic),
- X<sub>5</sub> = Marketing experience (years),
- X<sub>6</sub> = Marketing cost (₦),
- X<sub>7</sub> = Quantity purchased per week (₦),
- U<sub>i</sub> = Error term.

The four functional regression models were used and expressed in the explicit forms as:

1. Linear function:  

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u_i \quad \dots(2)$$
2. Semi-log function:  

$$Y_i = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 \quad \dots(3)$$
3. The double-log function (Cobb-Douglas):  

$$\ln Y_i = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + u_i \quad \dots(4)$$
4. Exponential function:  

$$\ln Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u_i \quad \dots(5)$$

where;

Y= dependent variable

b<sub>0</sub> = constant

b<sub>1</sub> – b<sub>7</sub> = estimated regression coefficient

X<sub>1</sub> – X<sub>7</sub> = independent variables

U<sub>i</sub> = error term (Yilmaz and Ozkan, 2004; Shehu *et al.*, 2007 and Rahman, 2014).

The semi-log functional form was found to be best fitted therefore, chosen as the lead equation.

## RESULTS AND DISCUSSION

### Factors Determine Profit in Wholesale marketing of Water Melon

Table 1 shows the regression analysis result for Water melon wholesale marketers in respect of surplus, balance and scarcity periods. The estimated functions were evaluated in terms of statistical significance of the coefficients of multiple determination R<sup>2</sup>; F-values; the significance of the coefficients and the T-value. The result indicated the R<sup>2</sup> values of 8.0%, 14.0% and 5.0% in respect of surplus, balance and scarcity periods with the F-values of 1.690, 0.118 and 1.353 which are not significant respectively. The result further revealed that, the estimated coefficients of multiple determination of R<sup>2</sup> postulated regression that is included variables in the model explained only 8.0%, 14.0% and 5.0% variation of the regression (net income of water melon marketers) in respect of surplus, balance and scarcity periods, respectively. In surplus period, only marketing costs was found positively related with the net income of marketers and significant at 5% level of probability. This implying that any increase in the marketing cost of the marketers lead to one unit increase in the net returns of the wholesale water melon marketers and vice versa. Thus, as marketers will spend much to acquire most quality good at any expense, will earn them more profit in returns. The result is in line with findings of Ukwuaba (2017), Sajo (2015), Kainga (2013) and Onyemauwa (2010) who reported a positive and significant effect of cost of marketing on the net marketing returns of their respondents. All other variable were found to be positively related to the income with exception of age and years of experience which are all negative and not significant.



**Table 1:** Influence of Socio-Economic Variables on Profit of Wholesale Water Melon Marketers

Variable	Surplus	Balance	Scarcity
Constant	2.963*** (31.529)	3.151*** (55.261)	2.925*** (53.361)
Age	--0.001 (-0.646)	0.000 (-0.240)	-0.001 (-0.453)
Marital status	0.007 (0.473)	-0.003 (-0.285)	0.000 (0.042)
Household size	0.006 (1.409)	4.247 (0.020)	0.003 (1.607)
Education level	0.002 (1.072)	0.000 (0.250)	0.003** (2.300)
Marketing experience	0.000 (-0.168)	0.000 (0.170)	-0.002* (-1.803)
Marketing cost	1.730** (3.180)	-1.444 (-0.609)	4.260 (0.244)
Quantity purchased	6.291 (0.269)	2.105 (0.147)	1.466 (0.102)
F-statistics	1.690	0.118	1.353
R-square	0.216	0.019	0.181
R <sup>2</sup> -adjusted	0.088	0.141	0.047

Note: \*Significance at  $P \leq 0.01$ ; \*\* Significance at  $P \leq 0.05$  and \*\*\* Significance at  $P \leq 0.001$ . Figures in parenthesis are t-values.

Source: Field survey, 2016-2017

In balance period as presented in Table 1, all the socio-economic variables used in the regression were not significant at any level of probability and positively related with net income with the exception of marital status and marketing cost of the marketers that were found to be negative. The influence of socio-economic variables of respondents in respect of scarcity period indicated that only two (2) variables were found to be significant at different levels of probability, these include education and marketing experience. The result further revealed that educational level of wholesale water melon marketers found to have positive influence on their net incomes and significant at 5%. The positivity of the coefficients signified that the more educated the marketers are the more profit the will realised in the business and vice versa. This might due to the fact that educated people most adopt new innovations than illiterates. Thus can have better chance of get more profit. The result is in line with the findings of Adamu *et al.* (2015). The result further showed the negative influence of years of experience to the marketer’s net income and significant at 1%. The negativity relationship may be attributed to the fact that the marketing of water melon in the area was not long been started, thus made years of experience to less or negative influence on the marketing net returns. The study is in line with findings of Abdulrahman (2014) and Nwaru *et al.* (2011) that the marketing experience of respondents influenced negatively to their net incomes. Thus, is contrary to study of Oladejo and Sanusi (2008) where theirs influenced positively.

**Factors Determining Profit in Retail marketing of Water Melon**

Table 2 showed the relationship between the age, marital status, household size, education, marketing years of experience, marketing cost and quantity purchased retail Water melon marketers with net incomes. The estimated function was valued in terms of statistical significance of the coefficients of multiple determination R<sup>2</sup>, F-statistics, the significance of



the coefficients and the t-values. The result shows the R<sup>2</sup> values in respect of surplus, balance and scarcity periods as 47.7%, 51.3% and 52.0%, respectively, with the F-values of 29.041, 33.351 and 34.309 each significant at 1% level of probability. This implies that the variation in the net income of Water melon marketing in respect of surplus, balance and scarcity periods respectively was due to these explanatory variables included in the model. In surplus period, marketing experience, marketing cost and quantity purchased were found to have positive regression coefficients and significant at 5%, 1% and 1% levels of probability.

**Table 2:** Influence of Socio-Economic Variables on Profit of Retail Water Melon Marketers

Variable	Surplus	Balance	Scarcity
Constant	2.032***	2.131***	1.955***
	(7.335)	(9.037)	(9.873)
Age	-0.012*	-0.014**	-0.004
	(-1.835)	(-2.626)	(-0.908)
Marital status	0.055	0.109*	0.122**
	(0.682)	(1.695)	(2.159)
Household size	0.012	-0.001	-0.002
	(1.029)	(-0.071)	(-0.302)
Education level	-0.003	-0.014**	-0.001
	(-0.367)	(-2.242)	(-0.184)
Marketing experience	0.018**	0.020**	0.011*
	(2.081)	(2.817)	(1.703)
Marketing cost	4.496***	4.743***	2.820***
	(3.805)	(4.876)	(5.432)
Quantity purchased	0.007***	0.009***	0.010***
	(13.746)	(13.532)	(12.018)
F-statistics	29.041***	33.351***	34.309***
R-square	0.494	0.529	0.536
R <sup>2</sup> -adjusted	0.477	0.513	0.520

Note: \*significance at 10%; \*\*significance at 5% and \*\*\*significance at 1%. Figures in parenthesis are t-values.

Source: Field survey, 2016-2017

As revealed in Table 2, the positivity means that the variables has direct relationship in which, any increase in one unit of each of these variables might result to an increase in one unit the marketers net income and vice versa. The result is in agreement with that of Ukwuaba (2017), Osondu *et al.* (2014), Onyemauwa (2010) and Kainga (2013) who reported a positive and significant effect of marketing experience and marketing cost on the net marketing returns of their respondents.

In balance period six (6) variables were significant this include the marital status, marketing experience, marketing cost and quantity purchased which has positive coefficient and significant at 10%, 5%, 1%, and 1% level of probabilities, implying that the variable demonstrated a positive influence on the marketers net returns. This shows that an increase in any of these variables might result to increase in a unit of the marketer’s net income and vice versa. Other variables found to be significant were the marketer’s age status and education at 5% and 5%, respectively in which they recorded negative regression coefficients meaning that they negatively influenced the respondents’ net returns. The negativity relationship of these 2 variables might not be unconnected with the fact that little or no special skills are required in



the marketing of watermelon. It could also be that as one becomes more educated, the attention and seriousness given to the watermelon enterprise would reduce, thereby leading to loss of customers and consequently, reduction in income level. This is justifiable as more educated people are involved in white collar jobs, and thus would pay less attention to the trade. This is in line with the study of Ukwuaba (2017).

In scarcity period, four (4) variables were found to be significant. These include the marital status; marketing experience, marketing cost and the quantity purchased which had positively influence on the net income and were significant at 5%, 10%, 1% and 1% respectively. The positivity relationship of the marital status and marketing experience might be due to the fact that most of the married people were believed to be highly responsible and can easily gather experience in any business they engaged in. Thus may use this advantage over those not married and inexperienced marketers, hence got more profit at returns. This is similar to study of Oladejo and Sanusi (2008) that year of experience was found to have significant influence on net income of his respondents. The positive relationship of marketing cost and the quantity purchased could be linked with the fact that when marketers invest more into purchasing of good quality and more quantity water melon for sale, the cost may be expensive but there will be better return, because consumers will not mind paying a little price for good quality and attractive water melon. Thus, may result in receiving higher net returns. This is in line with the findings of Adesina (2013) that cost of pineapple has a direct relationship with net return which implies that the higher the cost of pineapple, the higher the net return and vice versa.

## CONCLUSION AND RECOMMENDATIONS

In conclusion, the study realised that retail Water melon marketers in scarcity period recorded the higher number of significant variables with marketing costs and quantity purchased topping at ( $P \leq 0.001$ ) each. Therefore, the socio-economic variables of marketers at retail category were found to influence more in determining the net income of water melon marketers in the study area. The study therefore recommended that marketers should ensure to get less marketing cost to purchase large quantity of water melon at a minimum cost, hence maximise profit in return

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