# SOCIO-ECONOMIC DETERMINANTS OF NET INCOME IN SWEET MELON MARKETING IN BAUCHI AND GOMBE STATES, NIGERIA

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**Abstract:** The study examined the influence of socio-economic variables on net income of wholesale and retail of sweet melon marketing in Bauchi and Gombe States, Nigeria. Multi-stage sampling technique was used to select 300 respondents from 18 markets. Where 135 sweet melon marketers were selected from Bauchi State and 165 from Gombe State as indicated in sampling procedure. Data were collected using structured questionnaires. The regression analysis of wholesale marketing of Sweet melon in both surplus, balance and scarcity periods indicated that no variable was found to be significant at any level of probability. At retail category, the result revealed that balance period recorded the higher number of significant variables with the R-square value of 0.179 and F-statistics of 6.692 (P$\leq$ 0.001).  The marketing cost variable having positive coefficient was found to be higher and significant at P$\leq$ 0.001 level of probability. Age, education and experience had positive influence on the marketers' net income but significant at P$\leq$ 0.05 each. Conclusively some of the socio-economic variables of marketers at retail category were found to influence more net income of sweet melon marketers in the study area.
**Keywords:** Socioeconomic, determinants, net income, sweet melon, marketing

## Introduction
Agricultural marketing involves the performance of all the (business) activities involved in the flow of agricultural products and services from the initial points of agricultural production until they reach the hands of the ultimate consumers (Haruna *et al.,* 2012). Fruit vegetables are edible plant produce that are good for human health. They are nutritionally important to man as they provide the much needed vitamins, minerals and fibre. They form the most vital component of diet in our daily nutrition because it is a rich source of; adequate energy, nutrients, vitamins and other dietary factors such as; carbohydrate, proteins and fats i.e. essential amino acids (FAO, 2013). Irtwange (2006) reported that Marketing of fruit and vegetables in Nigeria is mainly informal; people selling them by the roadsides in local markets and some resolving to go round town conveying their goods on a sort of conveyor and selling it to interested customers. Adamu *et al.* (2015) also reported that sweet melon is one of the most important fruit vegetables cultivated and marketed in the tropics with increasing popularity in the world. It is consumed throughout the world and is mainly cultivated in the Asian countries.

Sweet melon (*Cucumismelo* L.) is a warm, long season crop adaptable to all climatic zones. Mature fruits of sweet melon cultivars are usually consumed fresh for the sweet and juicy pulp. The pulp is also mixed with water and sugar, or with milk, and sometimes served as refreshing drink or made into ice cream. Immature fruits of non- sweet types, including snake, are used as a fresh, cooked, or pickled vegetable and are also stuffed with meat, rice and spices or fried in oil (Adamu, 2015). The fresh produce of the world productionfor fruits and vegetables represents 9% international trade, 30% industrial and the remaining 61% covers the domestic markets (Irtwange, 2006).

The objective of the study was to examinethe influence of socio-economic variables on net income of wholesale and retail sweet melon marketers in Bauchi and Gombe States, Nigeria.

## Materials and Method
### The study area
The study areas are Bauchi and Gombe States. Bauchi State lies between Latitudes $10^0$ 17' and $11^0$ 00'N and Longitudes $9^0$ 45' E and $11^0$12'E. It has a land area of 49,119 km$^2$ and a projected population of 6, 164, 096 inhabitants (NPC, 2006) census with a 2.8 percent annual growth rate of the population (NPC, 2006). The climate 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 600 to 1300 mm, while the minimum and maximum temperatures ranges from 18.5 to 32$^0$C, with April as the hottest and  January as the coldest month respectively (BSADP, 2009).

Gombe State on the other hand lies between Longitudes $11^0$00'E and $11^0$11'E and Latitudes $10^0$ 16' and $11^0$ 00'N. It has a land area of 20,265 km$^2$ and a projected population of 3,159,693 people (NPC, 2006) census with a 2.8% annual growth rate of the population. The climate 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 600 to 1200 mm, with the minimum and maximum temperatures of 22.7 and 33.5$^0$C, respectively (GOSEEDS, 2010).

### Sample size and sampling technique
Multi-stage and purposive sampling technique was used.Stage oneinvolved the purposive selection of three (3) main local government areas from Bauchi and Gombe States. The second stage involved purposive selection of three (3) markets from each Local government Area of Gombe and Bauchi States, respectively. The last stage involved simple random selection of respondents from these markets. In all, 300 Sweet melon marketers were randomly selected from the sample frame of 1056 collected from the selected markets of the study area. The sampling was done based on proportionality factor as adopted from Adebayo (2008) and was used in this regard as:

$$S = \frac{p}{P} * \frac{Q}{1} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

**Where:** S = Sample size; p = Population of sweet melon marketers at each location; P= Total population sweet melon marketers in the study area; Q = Total questionnaires that were administered

### Method of data collection
Data for the study were collected from wholesale and retail Sweet melon marketers using structured questionnaires. The data were collected at different periods (i.e. at different marketing seasons) where surplus period ranged from the months of September to December, balance period from May to August, scarcity period ranged between Januarys to April. Table 1 shows the selection procedure of sweet melon marketers in Bauchi and Gombe States

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**Table 1: Selection procedure of sweet melon marketers in Bauchi and Gombe States**

| States/LGAs | Markets | Sample Frame | | | Total No. of marketers selected |
|---|---|---|---|---|---|
| | | **Wholesalers** | **Retailers** | | |
| **A. Gombe State** | | | | | |
| 1.Balanga | 1. Daban Magariya | 96 | 12 | 15 | 27 |
| | 2.Gelengu | 121 | 10 | 24 | 34 |
| | 3. Talasse | 54 | 6 | 10 | 16 |
| 2. Yamaltu –Deba | 1. Dadin Kowa | 73 | 6 | 15 | 21 |
| | 2. Kuri | 31 | 0 | 9 | 9 |
| | 3. Kwadon | 36 | 0 | 10 | 10 |
| 3. Gombe | 1. Gombe Central | 106 | 6 | 24 | 30 |
| | 2. Gombe Old | 32 | 0 | 9 | 9 |
| | 3. Pantami | 30 | 0 | 9 | 9 |
| | **Sub-Total** | **579** | **40** | **125** | **165** |
| **B. Bauchi State** | | | | | |
| 1. Bauchi | 1. Muda Lawal | 57 | 5 | 11 | 16 |
| | 2. Kangere | 31 | 0 | 9 | 9 |
| | 3. Yelwa | 29 | 1 | 7 | 8 |
| 2. Kirfi | 1. Bara | 111 | 5 | 27 | 32 |
| | 2. Badara | 62 | 2 | 14 | 16 |
| | 3. Cheledi | 57 | 0 | 16 | 16 |
| 3. Misau | 1. Dabigi | 34 | 0 | 10 | 10 |
| | 2. Misau | 51 | 1 | 14 | 15 |
| | 3. Zindi | 45 | 1 | 12 | 13 |
| | **Sub-Total** | **477** | **15** | **120** | **135** |
| **Grand Total** | | **1056** | **55** | **245** | **300** |

**Source:** Pilot survey, 2015-2016

### Method of data analysis

The data collected were analysed using multiple regression analysis. The result was used to describe the influence of socio-economic variables on the net income of the Sweet melon marketers.The model in its general form is specified as:
$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, U_i)$…………… **2**
**Where:** $Y$ = Estimated Net income of Sweet melon marketers (₦); $X_1$ = Age (years), $X_2$ = Marital status (1 =single; 2= married; 3 = divorced and 4= widowed), $X_3$ = Family size (number), $X_4$= Years of education attained (1 = primary; 2 = secondary; 3 = tertiary; 4 = Adult education and 5= Qur'anic), $X_5$ = Marketing experience (years), $X_6$ =Marketing cost (₦), $X_7$ = Quantity purchased per week (₦), $U_i$ = Error term.

The four functional regression models were used and expressed in the explicit forms as:
**The linear function;**
$Y_i = b_o + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u_i$ …………………...…...…..**3**

**The semi-log function;**
$Y_i = lnb_o + b_1lnX_1 + b_2lnX_2 + b_3lnX_3 + b_4lnX_4 + b_5lnX_5 + b_6lnX_6 + b_7lnX_7 + u$ ………………**4**

**The double-log function (Cobb-Douglas);**
$lnY_i = lnb_o + b_1lnX_1 + b_2lnX_2 + b_3lnX_3 + b_4lnX_4 + b_5lnX_5 + b_6lnX_6 + b_7lnX_7 + u_i$ ……….......... **5**

**The exponential function;**
$lnY_i = b_o + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u_i$ …………**6**
**Where:** $Y$ = dependent variable; $b_o$= constant; $b_1 – b_7$ = estimated regression coefficient; $X_1 – X_7$ = independent variables; $U_i$= error term

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

### Results and Discussion

#### Influence of socio-economic variables on net income of wholesale sweet melon marketers

The Influence of Socio-Economic Variables on Net Income of Wholesale Sweet Melon Marketers was shown in Table 2. The estimated functions were evaluated in terms of statistical significance of thecoefficients of multiple determinations of Rsquare, the F-statistics, significance of the coefficients and the T-values. The result indicated that the included variables in the model explained 8.0, 8.0 and 1.0% in the variation of the income with respect to; surplus, balance and scarcity periods respectively, with the F-values of 0.371, 1.675 and 0.924 all not significant at all levels respectively.The result shows thatin surplus period only household size; educational attainment; marketing costs and quantity purchased were found to be positively related with the net income but not significant at any level. The positivity of the coefficients of marketing cost implies that any increase in the variable will directly influence the marketing income of Sweet melon. The result was in agreement with the findings of Ukwuaba (2017), Kainga (2013) and Onyemauwa (2010) who reported a positive effect of cost of watermelon on the net marketing returns. The result was also consistent with the finding of Osondu *et al*. (2014), Adamu *et al.* (2015) and Nwaru *et al.* (2011) who separately revealed that marketing cost and quantity purchased had positive regression coefficient respectively. This means than an increase in the said variables (marketing cost and quantity purchased) will lead to a corresponding increase in the net marketing income.
Other variables like age of the marketers, marital status and marketing experience showed a negative relationship with the net income and not significant. The negativity of the coefficients indicated that the variables might have negative effect on the net income of the commodity. In another words, the increase in the quantum of the variables will result in decrease in the net marketing income in the study areas. Thus the study revealed that the variables in question were found to

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be inversely related in the study area. This was consistent with the findings of Abdu (2006) that age of respondents was found to be negatively related with net income of the marketers in his study area.

In balance period only education, marketing experience and marketing cost variables were found to have negative relationship with the net income of the marketers, while all other variable were positive. The result indicated the $R^2$ 8% and F-statistics of 1.675 which are also not significant. Thus, the socio-economic variable of wholesale sweet melon marketers had less or no significant influence on their net incomes. The result was contrary to the findings of Adamu *et al.* (2015), Sajo (2015), Abdulrahman (2014), and Isibor and Ugwumba (2014) who reported that their respondents' socio-economic variables influenced their net incomes either positively or negatively at different significant levels. The result also denoted that in scarcity period household size and quantity purchased were found to have positive regression coefficients and butsignificant at any level of probability. F-statistics was also not significant with negative $R^2$ value of -1%. This means that the variables used has less or no significant influence in the marketing incomes of wholesale water melon marketers in the study area. In another words the variation in income of the marketers were not explained by the variables.

**Table 2: Distribution of the influence of socio-economic variables on net income of wholesale sweet melon marketer (Semi-Log model)**

| Periods | Surplus | Balance | Scarcity |
|---|---|---|---|
| Constant | 2.674*** | 2.651*** | 2.911*** |
|  | (63.599) | (53.426) | (44.008) |
| Age | 0.000 | 0.001 | -0.001 |
|  | (-0.417) | (0.534) | (-0.723) |
| Marital status | -0.010 | 0.005 | -0.025 |
|  | (-0.679) | (0.305) | (-1.008) |
| Household size | 0.001 | 0.001 | 0.002 |
|  | (0.361) | (0.628) | (0.822) |
| Education level | 0.000 | -0.001 | -0.003 |
|  | (0.440) | (-0.751) | (-1.531) |
| Marketing experience | -6.795 | 0.000 | 0.000 |
|  | (-0.082) | (-0.110) | (-0.104) |
| Marketing cost | 7.798 | -7.795 | -6.774 |
|  | (0.723) | (-0.975) | (-0.873) |
| Quantity purchased | 1.653 | 4.914 | 1.315 |
|  | (0.354) | (0.707) | (1.247) |
| **F- Statistic** | 0.371 | 1.675 | 0.924 |
| **R²** | 0.051 | 0.196 | 0.119 |
| **R² adjusted** | 0.087 | 0.079 | 0.010 |

**Source:** Field Survey, 2016-2017
Figures in parenthesis are t-values, while *Significance at P≤0.01, ** Significance at P≤0.05 and *** Significance at P≤0.001

**Table 3: Distribution of the influence of socio-economic variables on net income of retail sweet melon marketer (Semi-Log model)**

| Periods/ Variables | Surplus | Balance | Scarcity |
|---|---|---|---|
| Constant | 2.246*** | 2.218*** | 2.464*** |
|  | (26.555) | (31.412) | (39.869) |
| Age | -0.001 | 0.000 | 0.002* |
|  | (-0.523) | (0.232) | (1.679) |
| Marital status | 0.036** | 0.031** | -0.002 |
|  | (1.972) | (2.047) | (-0.111) |
| Household size | 0.001 | -0.002 | -0.002 |
|  | (0.316) | (-0.726) | (-0.660) |
| Education level | 0.002 | 0.004** | 0.003** |
|  | (1.282) | (2.797) | (2.208) |
| Marketing experience | 0.005** | 0.004** | 0.002 |
|  | (2.465) | (2.250) | (0.868) |
| Marketing cost | 1.415 | 3.411*** | 2.087*** |
|  | (0.943) | (3.292) |  |
| Quantity purchased | -5.764 | 0.000 | 2.088 |
|  | (-0.302) | (0.835) | (0.084) |
| **F- Statistic** | 3.374** | 6.692*** | 5.010*** |
| **R²** | 0.097 | 0.179 | 0.137 |
| **R² adjusted** | 0.068 | 0.149 | 0.11 |

**Source:** Field Survey, 2016-2017
Figures in parenthesis are t-values, while *Significance at P≤0.01, **Significance at P≤0.05 and ***Significance at P≤0.001

***Influence of socio-economic variables on net income of retail sweet melon marketers***

Table 3 showed the Influence of Socio-Economic Variables on Net Income of Retail Sweet Melon Marketersin respect of surplus, balance and scarcity periods. Theestimated functions were evaluated in terms of statistical significance of the coefficients of multiple determination of $R^2$, F-statistics, significance coefficients and the T-values. The $R^2$ values of 8.0, 15.0 and 11.0% were obtained in respect of surplus, balance and scarcity periods respectively. This implies that 8.0, 15.0 and 11.0% of the variation in the net income of retail Sweet melon marketing in respect of surplus, balance and scarcity periods respectively occurred due to these explanatory variables included in the model with the F- values of 3.3474 and significant at P≤ 0.001, 6.692 at ≤ 0.001 and 5.010 at P≤ 0.001, respectively.

In surplus period the result indicated that only marital statusand years of experience were found to be positively influenced the marketer's net income and significant at P≤ 0.05 levels of probability each, respectively. The positivity of these variables coefficient indicated that the marital status the marketers influence the level of their net income. Because people believed that any married person is considered as a complete gentleman that is conscious of what is doing and can able to usenew marketing strategies or innovations that can be brought to him effectively to make more profit in his business. Thus, implying that a unit increase in the variable will bring about a corresponding one unit increase in respondent's net income and vice versa. The result was in disagreement with the findings of Nwaru *et al*. (2011), Sajo (2015) Abdurrahman (2014) who reported marital status to haveno influence on the net income of their respondents. The positive influence of their marketing experiences indicated that any increase in years in the business added more net income of the business, thus leading to higher efficiency by gaining more strategies in minimising costs and as well maximising. The result was in line with the findings of Kainga (2013) and Oladejo and Sanusi (2008), who separately reported that years of experience of the fruits vegetable marketers was positively related with the net incomes of the marketers. All other variables were found to be positively related with the income but not significant with the exception of age and quantity purchased which were negative.

In balance period, marital status, educational attainment, marketing experience and marketing cost variables were found to have positive influence on the net incomes of the respondents and were significant at P≤ 0.05 each with the exception of marketing cost that is significant at P≤ 0.001. The positivity of these variables indicated that any increase in the unit of each of these variables will lead to a unit increase in the net income of the respondents and vice versa. The positivity relation of marketing cost is in line with the studies of Ukwuaba (2017), Kainga (2013) and Onyemauwa (2010).

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The remaining variables like quantity purchased were found to be positively related but not significant with the exception of household size which is negative.

Inscarcity period, three (3) variables were found to positively influence the net income of retail sweet melon marketers and significant, this include age, education and marketing costat $P \leq 0.01$, $P \leq 0.05$ and $P \leq 0.001$ levels of probability. While educational level of the respondents was found to be significant at $P \leq 0.05$. The positivity relationship in respect of respondents' age and education implies that an increase in any of these variables lead to increase in the net income of the marketers and vice versa. The result also denoted that the older and the more years spent in the business, the more experienced the marketers are hence, utilized all available strategies that can enable them to minimise cost and as well maximise profit and vice versa. Similarly, the result agreed with study of Adesina (2013) that the age of marketers and cost of pineapple was found to influence the higher net return. This could be linked to the fact that when marketers invest more into purchasing of good quality pineapple for sale, the cost may be expensive but there will be better more, because consumers will not mind paying a little additional price for good qualitative and attractive pineapple. Conversely, the study was contrary to that of Kainga (2013) on Water melon marketing in Yenagoa of Bayelsa State, where age and purchased price were found to be negatively correlated with the net income.

## Conclusion

In conclusion, the result revealed that retail sweet melon marketers recorded the higher number of significant variables in balance period with marketing cost variablehaving positive coefficient was found to be higher and significant at $P \leq 0.001$ level of probability. Thus, these variables influenced much of the marketers' Net income in balance period compared to surplus and scarcity periods, respectively.

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