Alex-Ekwueme
Federal University
Ndufu-Alike Ikwo
Ebonyi State Nigeria

EFFICIENCY AND PROFITABILITY OF CITRUS MARKETING IN BENUE STATE OF NIGERIA

D. AKURA, Z. NYIATAGHER & A. OCHOLI

Department of Agribusiness, University of Agriculture, Makurdi – Nigeria.
PMB2373 Makurdi

ABSTRACT

This paper analyzed efficiency and profitability in citrus marketing in Benue State, Nigeria. Purposive, multi-stage and stratified sampling techniques were employed to obtain 147 market actors (producer marketers, wholesalers and retailers) in the study area. Data were collected with the use of structured questionnaires, analyzed using descriptive and inferential statistics. Results from the analysis revealed that majority (60.5%) of the actors were male with mean age of 32 years. The market was monopolistic with free entry and exit. The Gini - coefficients were 0.755, 0.34 and 0.72 for producer marketers, wholesalers and retailers respectively. The profitability ratio were 0.77, 0.64 and 0.2 for producer marketers, wholesalers and retailers respectively. Results further showed that the actors were 51%, 57% and 20% efficient for producer marketers, wholesalers and retailers respectively with marketing margins of 33.6%, 36.2% and 15.8% respectively. For efficient marketing of citrus in the study area, policy formulation and implementation, proper supervision of citrus marketing programme must also be efficient, effective extension services and proper agricultural financing. These would pave way to increase profit and will help alleviate poverty in Benue State. It is also recommended that citrus marketers in the study area should form cooperative group(s) to have access to loans from bank(s) for better capital base for higher output.

Key Words: Efficiency, Profitability, Citrus, Marketing.

INTRODUCTION

Citrus is a group of subtropical fruits which belong to the family *Rutaceae* and subfamily *Aurantioideae* (Mamo, 2009). It originated in the Malay Archipelago of the South - East Asian Region. Citrus fruits are among the most important fruits grown worldwide, especially in warm temperate and humid subtropical and tropical regions (Opeke, 2005). In Nigeria, about 930,000 tonnes of citrus fruits are produced annually from an estimated 3 million hectares of land (Food and Agriculture Organisation - FAO, 2008). Major producing states include Benue,

Nassarawa, Kogi, Ogun, Oyo, Osun, Ebonyi, Kaduna, Taraba, Ekiti, Imo, Kwara, Edo and Delta (International Institute for Tropical Agriculture –IITA, 2001). Citrus is one of the most important tree crops in Nigeria utilized for both fresh consumption and industrial processing (International Institute for Tropical Agriculture - IITA, 2001). It is rated amongst the ten most important fruit tree crops in Nigeria and is widely cultivated. High yielding matured citrus tree attracts good prices at the market. Citrus fruit falls among the group of perishable commodities and thus needs special treatment and storage to prevent

losses. In West Africa there are no special storage facilities such as cold warehouses for most of these food commodities and thus great losses are therefore sustained. Poor storage facilities coupled with improper handling and transportation stress lowers quantity and quality and causes losses leading to reduced market margins and poor returns (Ugwumba, 2009). Asogwa and Okwoche (2012) noted that one-quarter of what is produced never reaches the consumer for whom it was grown, and the effort and money put into production is lost forever. Citrus production in Nigeria and Benue in particular has the potential of being highly profitable, providing employment opportunities, generate income and bringing about increased commercialization of the rural sector (Weinberger and Lumpkin, 2007). The bulk of citrus produced in the State is accounted for by oranges, but significant quantities of grape fruits, lemons and limes are also grown (Onyenobi *et al*, 2009). A number of critical bottlenecks hamper the growth of the traditional citrus sector in Benue State: lack of access to high quality seedlings; high perishability and post harvest losses; lack of appropriate market infrastructure for handling perishable produce; weak linkages between supply chain actors (i.e. input suppliers, producers and markets); lack of well structured and organized markets leading to high transaction costs along the supply chain; lack of mechanisms to set prices (i.e. citrus are usually sold by farmers mostly on the basis of "cost of living" rather than production costs or supply and demand conditions), resulting in low bargaining power of farmers; and ineffective institutional policies to enhance trade within and between regions and countries (Lenne & Ward 2010; Lyatuu *et al*, 2009). Agricultural marketing is concerned with all stages of operations which include movement

of commodities like citrus from farms to the consumers. It involves the performance of all activities involved in the flow of goods and services from point of initial production until they are in the hands of the ultimate consumer (Adesiyan, Adeleke and Salako, 2007).

The Federal and State governments of Nigeria are making it a matter of policy attention to diversify the present over dependence of the country's economy on oil, by focusing on tree crops such as cocoa, citrus and food crops such as cassava production which is a reflection of the set up of the presidential initiative on the production of these crops. As a result of this, more people are going into establishment of citrus plantations which in the long run will necessitate the spring up of more plantations and participation of many people in citrus marketing in Nigeria (Ahmed, 2008). A review of literature in agro-industry supply chain in Nigeria indicates that the sector faces many challenges due to limited market outlets, limited efforts in market linkage activities and poor market information among actors (Dereje, 2007; Kaleb, 2008; Dendena *et al*., 2009). Mamo (2009) also argued that small- scale, dispersed and unorganized producers are unlikely to exploit market opportunities as they cannot attain the necessary economies of scale and lack bargaining power in negotiating prices. It is very much evident that the core challenge for the development of citrus commercialization is the absence of a network of functional value chains. In order to make this chain effective and functional, the profitability levels, marketing efficiencies, margins have to be identified and addressed as a priority. In doing so, the study would help to find the weakest link of the chain and narrow the information gap on the subject.

The specific objectives of the study are; to:

    i) examine the socio-economic

characteristics of citrus marketers in the study area;

ii) assess the structure and conduct of citrus markets/ marketing;

iii) analyze the costs and returns associated with citrus marketing;

iv) estimate the marketing margins and efficiency of the different market actors;

Statement of Hypotheses

Based on the study objectives, the following hypotheses were postulated and tested:

$H0_1$: There is no significant difference between the marketing margins of wholesalers and retailers

$H0_2$. There is no significant difference in the level of profit between the producer marketers and the wholesalers.

METHODOLOGY

The Study Area

The study was carried out in Benue state. Benue State derives its name from River Benue, the second largest river in Nigeria. The State was created in 1976, is located in the middle belt region of Nigeria, approximately between Latitudes 6.5º and 8.5º North of the Equator and Longitudes 7.5º and 10º East of the Greenwich Meridian. The state shares boundaries with five States namely; Nassarawa to the North, Taraba to the East, Cross River to the South East, Enugu to the South West, and Kogi to the West. The Southern part of the state also shares boundary with the Republic of Cameroon. The state has in the North 280 km River Benue, and is traversed by 202 km of river Katsina-Ala in the inland areas. The state has a total land area of about 30,955 square kilometers and administratively it is divided into 23 Local government Areas. Benue state has a tropical climate, which manifest two distinct seasons. The rainy season is from April to October while the dry season is from November to March. Annual average rainfall varies from 1750mm in the southern part of the state to 1250mm in the North. About 80% of the state population is estimated to be directly involved in semi-subsistence agriculture. The state is a major producer of food and cash crops like cassava, yams, rice, benniseed and maize. Others include sweet potatoes, millet and a wide range of other crops like soya-beans, sugarcane, oil palm, mango, citrus and bananas.

Population and Sampling Procedure

The population of the study comprised all citrus marketers in Benue State. Purposive, multi-stage and stratified sampling techniques were adopted for the study. In the First stage, two of the twenty three local governments, Vandeikya and Ushongo were purposively selected based on the *a priori* knowledge that the local governments are citrus producing areas and that both men and women are actively involved in citrus marketing. In the Second stage, five markets each were also purposively selected in the two local government areas previously selected on *a priori* information that they are leading citrus markets in terms of the existence of many buyers and sellers and also the volume of citrus to give a total of ten markets. In the third stage, the marketers were stratified into producer marketers, retailers and wholesalers and proportionately selected according to the population of each market. A list of the market participants was obtained from their market associations. The total selection based on the stratified samples will constitute the sample size of the study. From a sample frame of 611 registered citrus marketers, a sample size of 147 marketers was proportionately selected to constitute the study respondents.

Method of Data Collection

Data were collected mainly from primary source.

The primary source involved administration of structured questionnaire to the respondents. The questionnaire was of three categories namely; those for producer marketers, retailers, and wholesalers.

Validation and Reliability of Instrument

Content validity index (CVI) was used to measure the adequacy of the instrument items in this study. Content validity in this context sought to determine the relevance and adequacy of items included in the instruments. Using the Jury Method (Kerlinger, 1973), the entire instrument was subjected to the scrutiny of subject matter specialists. Each of the specialist independently gave his expert opinion on the relevance and adequacy of the items with respect to the objectives of the study. Based on the expert ratings of items relevance, the CVI was compared with alternative indices. This was done by translating item-level CVIs (i-CVIs) into values of a modified kappa statistic. An i-CVI of **0.78** was obtained as evidenced of a good content validity.

The test-retest method of affirming instrument reliability was employed in the study because of single item responses in the instrument. It directly assessed the degree to which test scores were consistent from one test administration to the next. The instrument was trial tested on 20 respondents drawn from the community areas of Vandeikya and Ushongo. It involved administering the same test to the same group of respondent at a three week interval. The first test scores were correlated with the second set, using Pearson product –moment correlation. A mean product-moment correlation coefficient (r) of **0.82** indicated high reliability.

Data Analysis Techniques

Data collected were analyzed using descriptive statistics and econometric models. Descriptive statistics include percentages, means, frequencies, variances and standard deviations. Simple descriptive statistics was used to achieve objectives (i); Gini coefficient was used to achieve objective (ii), gross margin analysis was used to achieve objective (iii); Marketing margin and efficiency analysis was used to achieve objective (v). Independent t-test was used to test hypotheses.

ANALYTICAL FRAMREWORK

Gini Coefficient

The **Gini coefficient** is a measure of inequality developed by the Italian statistician Corrado Gini and published in his 1912 paper "Variabilità e mutabilità". It is usually used to measure income inequality, but can be used to measure any form of uneven distribution. The Gini coefficient is a number between 0 and 1, where 0 corresponds with perfect equality (where everyone has the same income) and 1 corresponds with perfect inequality (where one person has all the income, and everyone else has zero income). The **Gini index** is the Gini coefficient expressed in percentage form, and is equal to the Gini coefficient multiplied by 100.

While the Gini coefficient is mostly used to measure income inequality, it can also be used to measure wealth inequality. This use requires that no one has a negative net wealth.
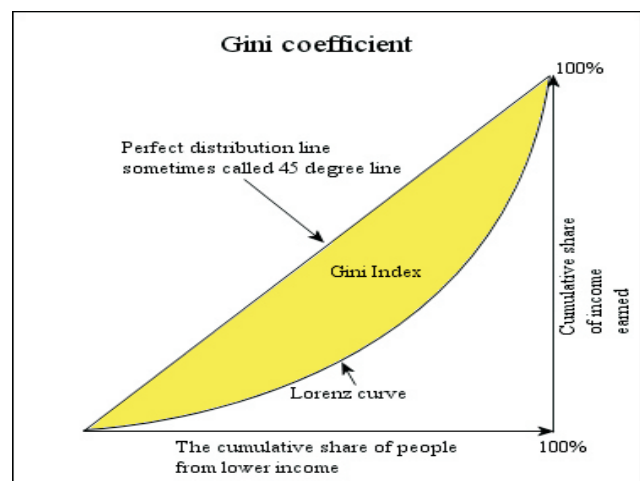
Calculation

Figure 1.Graphical representation of the Gini

coefficient

The small sample variance properties of G are not known, and large sample approximations to the variance of G are poor. In order for G to be an unbiased estimate of the true population value, it should be multiplied by n/(n-1).

The Gini coefficient is calculated as a ratio of the areas on the Lorenz curve diagram. If the area between the line of perfect equality and Lorenz curve is A, and the area underneath the Lorenz curve is B, then the Gini coefficient is A/(A+B). This ratio is expressed as a percentage or as the numerical equivalent of that percentage, which is always a number between 0 and 1.

The Gini coefficient is often calculated with the more practical Brown Formula shown below:

$$G = \left| 1 - \sum_{k=1}^{n}(X_k - X_{k-1})(Y_k + Y_{k-1}) \right|$$

G: Gini coefficient

Where;

X_i = percentage of sellers in the ith class of traders

Y_i = cumulative percentage of sellers in the ith class traders

K = number of classes

The Gini-cofficient range from 0 to 1, where 0, implies perfect equality in the distribution (perfect market) and !, implies perfect inequality (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.

Market Margin Analysis

Following Rehima (2006) and Abay (2007), who used marketing margin analysis to calculate profit of pepper marketing and profit of vegetables marketing respectively. This study adopted the formula for calculation of market margin analysis. The gross marketing margin for the participants was estimated separately using the formula given

below:

GM = SP-CP.............................(1)

Or

Also it can be expressed in percentage as follows;

Market margin =

$\dfrac{\text{Selling price} - \text{Purchase price}}{\text{Selling price}} \times 100$

Where;

GM = Gross Marketing Margin per bag of citrus (Naira/kg)

SP = Selling price per bag of citrus (Naira/Kg)

CP = Cost price per bag of citrus (Naira/Kg)

Net marketing margin was estimated using the following formula:

NM = GM - MC

NM = Net marketing margin (Naira)

GM = Gross marketing margin (Naira)

MC = Total marketing cost (Naira)

I bag of citrus is equivalent to 100kg.

Marketing Efficiency Analysis

To estimate the marketing efficiency for the participants, the Shepherd's index formula developed by Shepherd (1965) was employed. The formula is given by:

ME = GM/MC – 1 …………………………..(3)

Where:

ME = Marketing efficiency index

GM = Gross marketing margin (Naira/100kg of citrus)

MC = Total marketing cost (Naira/100kg citrus)

If ME = 1, marginally efficient

If ME > 1, marketing is highly efficient

If ME > 1 = marketing is not efficient

Gross Margin Analysis

Gross Margin is given as:

GM = TR – TVC

Where:

GM = Gross margin (Naira/bag)
TR = Total Revenue (Naira)
TVC = Total Cost (Naira)

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The socio economic characteristics of the respondents are presented in table 1. The distribution of citrus marketers based on sex shows that majority (60.5%) of the marketers involved in citrus marketing are males while 39.5% are females. The dominance of citrus marketing by males in the study area is a pointer to the belief in the study area that women are supposed to stay at home and in the farm while men struggle for survival through such businesses. This is also probably because the business requires a lot of energy and is labour intensive, involving moving from one place to another assembling the produce for marketing. This result is in the same direction with the findings of Baruwa (2013) and Effiong (2005) reporting that pineapple production and marketing is a male-dominated enterprise in Edo State of Nigeria.

Table 1 showed that the age of the marketers ranging between 20 - 30 years were predominant with 40.8%. Also 31.2% of the marketers are between the ages of 30 - 40 years. The mean age of the marketers was 32 years. The implication of the foregoing result is that citrus marketing in the study area enjoys higher patronage by the young people who are energetic enough to withstand the stress involved in the business. This result suggests that majority of citrus marketers in the study area are young farmers who are within the age bracket of people who are innovative and active at work (Asogwa and Okwoche, 2012). These category of marketers therefore can make meaningful impact in citrus marketing when adequately motivated with the needed marketing facilities.

About 66% of the marketers had more than secondary education. This result suggests that a good proportion of the marketers are literate enough to give room for effective communication in doing their citrus marketing business in the study area. This also suggests that new technology can be easily transferred to this area as most of them are literate. This is acceptable on the grounds that education affects the way farm business is managed as well as overall production (Jongur and Ahmed, 2008). Also, Effiong (2005) reported similar findings when he observed that 21% of pineapple farmers in Osun State had no formal education while 79% of them had some form of formal (primary, secondary and tertiary) education. This finding shows that an average farmer in the study area is fairly educated and therefore can take a better decision as regards the acceptance of innovation. Ekunwe, Orewa and Emokaro (2008) also indicated that education

enhanced the capacity of individuals to understand, manage and work with ideas.

The Table further revealed that majority (66.7%) of the marketers had marketing experience between 11 - 15 years which suggest the ability to manage risk and make quick decision resulting in better marketing performance. This means that citrus marketing is practically done by well experienced traders. The average farming experience for the citrus marketers in the study area was 13 years. Therefore, it can be mentioned that the citrus marketer in the study area have sufficient experience in citrus. This situation agrees with the findings of Effiong (2005) who reported that the average farming experience of pineapple farmers in Osun State was 13.5 years.

The result also revealed that majority (62.6%) of the marketers are married as against 34% single; indicating that citrus marketing in the study area is common among couples. This studies compares favourably with the findings of Baruwa , (2013) who reported that majority or 66% of pineapple producer marketers in Edo State were married.

As regard the household size, 39.5% of the respondents had 1 – 5 people, 40.8% of the respondents had 5 – 8 people per household, 8.8% had 9- 12 people per household while 10.8% of the respondents had more than 12 persons. The average household size was 7 persons per household indicating that citrus marketers in the study area have a relatively large household size. This implies that additional labour could be hired to work on the farm especially where the farm size is large. This assertion agrees with those of Idiong, (2006) and Ogungbile, Tabo and Rahman (2002) reporting that a relatively large household size enhances the availability of labour. Ovharhe and Okoedo-Okojie (2011) also reported that adoption index might be positively or negatively related to the household size depending on the nature of the age structure and the amount of labour contributed by the members of the household.

The result also revealed that only 41% of the respondents had contacts with extension agents while 59% of the respondents had no contacts. This low frequency of contact with extension agents can be attributed to the limited number of extension agents (1:4000 farmers) in Nigeria which makes it impossible to reach all farmers by interpersonal means (Baruwa, 2013). This is in agreement with Ekunwe, Orewa, and Emokaro (2008) reporting that extension service in Nigeria is poorly organized and in some cases, unavailable.

Table 1: Socioeconomic characteristics of Marketers

Variable	Frequency	Percentage	Cummulative Percentage
Sex			
Male	89	60.5	60.5
Female	58	39.5	100
	157	100	
Age (years)			
20 – 30	60	40.8	40.8
31 – 40	46	31.2	72.0
41 – 50	23	15.7	87.7
51+	18	12.3	100
	147	100	
Mean Age	32		
Marital Status			
Single	50	34	34
Married	92	62.6	86.6
Divorce/Widow	5	3.4	100
	147	100	
Household size			
1 – 4	58	39.5	39.5
5 – 8	60	40.8	80.3
9 – 12	13	8.8	89.1
13 – 16	16	10.9	100
	100	100	
Mean Household size	7		
Experience			
0 – 5	2	1.4	1.4
6 – 10	24	16.3	17.7
11 – 15	98	66.7	84.4
15+	23	15.6	100
	147	100	
Mean experience	13		
Education			
0 – 6	15	10.2	10.2
7 – 11	35	23.8	34.0
12+	54	36.7	70.7
	43	29.3	100
	147	100	
Education			
Primary	51	34	34
Secondary	90	62	96
Tertiary	06	4	100
	147	100	
Extension Contact			
Contacts	61	41	41
No contacts	86	59	100
	147	100	

Source: Field survey data, 2015

Market Structure and Conduct of Citrus

Market conduct of citrus

Table 2 revealed the percentage distribution of citrus marketers by membership of marketing association. Majority (84.4%) of the citrus

marketers in the study area subscribed to the membership of marketing association, whereas 15.6% do not subscribe to the membership of marketing association. Those involved in citrus Marketing Association did so because of easy access to extension services, market and credit facilities. This result agrees with findings of Nyiatagher and Ocholi (2015) who found that majority of maize marketers in Kwande local government of Nigeria belong to marketing associations. The result also showed that majority (52.4%) of the citrus marketers in the study area agreed that there is freedom to buy and sell their citrus anywhere. This implies that citrus marketing in the area is structured in such a way that there is relative ease of entry and exit as well as freedom of buying and selling of citrus in the study area. Result further revealed that 37.4% of the marketers agreed that price fixing was by individual bargaining, 34.7% was by marketing associations and 27.9% of price fixing was by market forces. This indicated that price fixing among the marketers was majorly by individual bargaining, suggesting that the bargaining determine the price of citrus. The Table also indicated that citrus marketers obtained their marketing information mostly from market association (65.3%). This indicated that the associations have much influence on marketing activities that take place in the study area. Only 1.4 % of the marketers indicated that they get market information from the media, an indication that media information has no place in citrus marketing in the study area. The major advertising strategy (77%) in the market is by persuasion rather than open display. This is in agreement with findings of Ugwumba (2009) who found that persuasion was the main advertising strategy used in marketing of fresh maize in Anambra state of Nigeria. The results further show that the major

price determinants are in the order of quantity supplied (60.5%), cost of transport (49%) and the purchase price (35.4%).

Table 2: Market conduct of citrus

Parameter	Frequency	Percentage	Cummulative Frequency
Membership to Association			
Yes	124	84.4	84.4
No	23	15.6	100
	147	100	
Freedom of Entry/Exit			
Yes	77	52.4	52.4
No	70	47.6	100
	147	100	
Price Fixing			
Individual bargaining	55	37.4	37.4
Market Forces	41	27.9	65.3
Market Association	51	34.7	100
	147	100	
Source of Marketing Information			
Middlemen	49	33.3	**33.3**
Market Association	96	65.3	**98.6**
Media	2	1.4	**100**
	147	100	
Advertising Strategy			
Open Display	33	22.4	**22.4**
Persuasion	114	77.6	**100**
	147	100	
Price Determination			
Purchase Price	52	35.4	
Consumer bargain	51	34.7	
Quantity Purchased	33	22.4	
Quantity Supplied	89	60.5	
Transport Cost	72	49	

Source: Field survey data, 2015

Market Structure of Citrus

Further results of market structural analysis of citrus for producer marketers, wholesalers and retailers is presented in **Table 3, 4 and 5** respectively. The results of the Gini coefficient of 0.755, 0.34 and 0.72 for the producer marketers, wholesalers and retailers respectively showed that citrus trade among marketers in the study area is a competitive venture such that the action of a single participant does not affect the price of the produce. Results indicate that there were many sellers and buyers who had free entry and exit in and out of the citrus marketing business which indicates a tilt towards pure competitive market structure, confirming Oladejo and Sanusi (2008). The value of the Gini- Coefficients implied a high level of inequality in the sales revenue of respondents indicating a good degree of market concentration. The inequality in the market could also be as a result of variation in the investment level of the respondents. Citrus market associations existed in the study area but did not enforce restrictive rules to exclude anybody from selling in the market.

Table 3: Results of Gini Coefficient Analysis of Producer Marketers

Monthly Sale (N)	Frequency	% Marketers (X_1)	Total value of Monthly Sales	% value of Monthly Sales	Cumm % of Total Weekly Sales (Y_1)	$\Sigma X_1 Y_1$
45001-55000	4	7.8	200400	5.2	5.2	.0041
55001-65000	6	11.8	363030	9.6	14.8	0.0113
65001-75000	9	17.6	630900	16.6	31.4	0.0292
75001-85000	19	37.3	1524075	40.2	71.6	0.150
85001- 95000	11	21.6	880080	23.2	94.8	0.050
>95000	2	3.9	192700	5.2	100	0.002
TOTAL	51	100	3791185	100		0.2466

Gini Cofficient = 1-ΣXY, 1 - 0.245 = 0.755.

Source: Field survey data, 2015

Table 4: Results of Gini Coefficient Analysis of Wholesalers

Monthly sale s (N)	Frequency	% Wholesalers (X_1)	Total Value of Monthly Sales	% Value of Monthly Sales	Cumm % of Total W eekly Sales (Y)	$\Sigma X_1 Y_1$
250001-500000	4	8.7	388000	7.5	7.5	0.007
500001-750000	0	0	0	0	7.5	0
750001-100000	6	13	11375000	21.9	29.4	0.038
100001-1250000	36	78.3	40500000	77.6	100	0.61
TOTAL	46	100	52263000	100		0.66

Gini Cofficient = 1-ΣXY, 1 - 0.66 = 0.34

Source: Field survey data, 2015

Table 5: Results of Gini Coefficient Analysis of Retailers

Monthly Sales (N)	Frequency	% Retailers (X_1)	Total V alue of Monthl y Sales	% V alue of Monthly Sales	Cumm % of Total W eekly Sales (Y_1)	$\Sigma X1Y1$
100001-120000	9	18	991000	12.9	12.9	0.02
120001-140000	12	24	1560000	20.3	33.2	0.05
140001-160000	0	0	0	0	33.2	0
160001-180000	19	38	3230000	42.1	75.3	0.16
180001-200000	10	20	1900000	24.7	100	0.05
TOTAL	50	100	7681000	100		0.28

Gini Cofficient = 1-ΣXY, 1 - 0.28 = 0.72.

Source: Field survey data, 2015

Profitability Analysis (*Cost and Return*)

The result of cost and return analysis in Table 6 as a measure of profitability among the marketing actors revealed that producer marketers recorded an average total cost and total revenue of N 38,560 and N 68,375 respectively with an average profit of N 29,815. Also, the average total cost and total revenue for wholesalers was N 655,479 and N 1,072,780 respectively with an average profit of N 417,315. For the retailers, an average total cost and total revenue of N 133,220 and N 158,280 respectively was obtained from the data analysis with an average profit of N 25,060. However, the size and the positive values of profit obtained confirmed to the fact that citrus marketing actors were able to cover their operating expenses with a significance level of profit level obtained from the study area. The implication is that citrus marketing in the study area is profitable.

Measure of Market Performance (Profitability and Efficiencies)

Profitability Ratio: The computed profitability ratio as presented in Table 6 for producer marketers, wholesalers and retailers were 0.77, 0.64 and 0.20 respectively. This means that for every N100 invested by producer marketers, wholesalers and retailers each gained N 77, N 64 and N 20 respectively in the study area. Hence, Citrus marketing is confirmed to be profitable in conformity with the earlier findings under cost and return analysis.

Efficiency Ratio: The estimated efficiency ratios for producer marketers, wholesalers and retailers are 1.77, 1.64 and 1.20 respectively. Meaning that as the efficiency ratios of each marketing actor was greater than unity is an indication that their operations are efficient.

Table 6: Distribution of cost and Returns of Marketers per 100kg

Parameter	Producer Marketers	Wholesalers	Retailers
Total Cost (N)	38,561	655,470	133,220
Total Revenue (N)	68,375	1,072,780	158,280
Profit	29,814	417,315	25,060
Profitability Ratio (π/TC)	0.77	0.64	0.2
Efficiency Ratio (TR/TC)	1.77	1.64	1.2

Source**:** Field Survey, 2015

Marketing Margin and Efficiency

Marketing Margin

Table 7 presents the marketing margin of an average citrus marketer in the study area. The result showed that the farm gate price is N500 per 100kg of citrus, while the wholesale price is N1000 and the retail price is N1, 200 per 100kg. This indicated that marketing margin of an average citrus marketer per 100kg in the study area is N168, N362 and 190 for producer marketers, wholesalers and retailers and the percentage marketing margin is 33%, 36.2% and 15% respectively. This implies that citrus marketing in the study area is profitable. Also, 100% retail price paid by the final consumer result in farm-to-retail price spread (marketing margin) of 27.7%. In order words, an average citrus marketer in the study area earns a market margin (farm-to-retail price spread) of 0.277 Naira for every 1 Naira retail price paid by the final

consumer in the marketing process. The low level of the average marketing margin of the marketers is largely attributable to the exploitative activities of the agents. This finding contradicts the observation of Jongur and Ahmed (2008) that farmer's margin was as high as 96.81% and the remaining 3.19% went to middlemen involved in sorghum marketing in Adamawa central zone. This is attributable to the highly exploitative activities of agents in the study area.

Table 7: Marketing margin of citrus marketers

Parameter	Producer marketer	Wholesaler	Retailer
Purchase price	--	500	1000
Pre harvest cost	32	0	0
Collection cost	45	0	0
Harvesting cost	50	0	0
Transport cost	50	50	5
Storage cost	5	30	0
Upkeep cost	100	0	0
Loading cost	0	20	0
Off loading cost	0	20	0
Agent fees	0	10	0
Levies	0	3	0
Repacking	0	5	5
Total marketing cost	332	638	1010
Selling Price	500	1000	1200
Net marketing margin	168	362	190
% Margin	33.6	36.2	15.8

Source: Field survey data, 2015

Marketing Efficiency

Table 8 indicated a marketing efficiency of 0.51, 0.57 and 0.20 for producer marketers, wholesalers and retailers respectively is less than 1, implying that the marketing system of citrus in the study area is therefore not efficient. The average percentage marketing efficiency of citrus marketers in the study area was 42.7. This showed that for every N1.00 spent, 42.7% is gained.

Table 8: Marketing Efficiency per 100kg bag

Variable	Producer marketers	Wholesalers	Retailers
Marketing cost (N)	332	638	1010
Marketing Margin (N)	168	362	190
Marketing Efficiency (N)	0.51	0.57	0.2
% Marketing Efficiency	51	57	20

Source: Field survey data, 2015

Result of t- test for marketing margin for wholesalers and retailers

The t – test result of marketing margins using the Levene's test of equality of variances for independent samples test is presented in table 9. The result indicates that the margin of wholesalers is significantly different from that of the retailers. Therefore, null hypothesis 1 that stipulated that there is no significant difference in the margin of wholesalers and retailers in the study area is rejected. This implies that wholesalers have higher margins than retailers in the study area.

Table 9. Test of difference between marketing margin of wholesalers and retailers in the study area.

	t	Df	Significance (2 – tailed)	Decision
Equal variances assumed	6.931	94	0.000*	Reject H_0
Equal variances not assumed	6.931	78.692	0.000*	

Source: Field survey data, 2015.* significant at 1%

Result of t- test for difference in gross margin of producer marketers and wholesalers

The t – test result of gross margins using the Levene's test of equality of variances for independent samples test for the respondents is presented in table 10. The result indicated that the gross margin for producer marketers is not significantly different from those of wholesalers in the study area. Therefore, the null hypothesis (H_0) that states that there is no significant difference in the gross margin is accepted. This implies that the gross margin for both categories of respondents has no significant difference in the study area.

Table 10: Test of difference between gross margin of producer marketers and wholesalers in the study area.

	t	Df	Significance (2 – tailed)	Decision Rule
Equal variances assumed	- 1.436	95	0.154	Accept H_0
Equal variances not assumed	- 1.436	76.63	0.154	

Source: Field survey data, 2015

CONCLUSION AND RECOMMENDATION

Citrus marketing is a profitable business, with attractive net return on investment in Benue State. Citrus marketing in the study area is monopolistic and inefficient. Marketing margin of an average citrus marketer is N1, 935**.** Citrus marketers are faced with several problems in their marketing activities.

1. Based on the findings, the study recommends that citrus marketers should form registered trade unions through which solution could be sought to the challenges of market price fluctuation, lack of market information as well as lack of market coordination in the study area. This union will constitute a strong bargaining force for the marketers.

2. Citrus marketers in the study area should form cooperative group(s) in order to obtain loans from bank(s) to increase their capital base. Loans will be easily acquired from these cooperatives without bottlenecks.

For efficient marketing of citrus in the study area, the constraints must be drastically reduced through efficient policy formulation and implementation, proper supervision of citrus marketing programme, effective extension services and proper agricultural financing. The constraints associated with the business if tackled, could pave a way to increase profitability and will alleviate poverty in Benue State, Nigeria.

REFERENCES

Abaye Akalu, (2007). Vegetable market chain analysis in Amhara National Regional State: the case of Fogera woreda, South Gondar zone. An M.Sc Thesis Presented to the School of Graduate Studies of Haramaya University.

Adebisi-Adelani, O. and Oyesola, O.B. (2014). Information sources and awareness of climate change by citrus farmers in Benue State, Nigeria. *Journal Seek, ScientificCommons and FAO.* V1(81): 21

Adesiyan, O.I.; Adeleke, O.A.; and Salako, B.A (2007). Economic Analysis of Poultry Marketing in Ido Local Government Area of Oyo State, Nigeria. *Research Journal of Poultry Sciences,* 1(3-4):23-25.

Ambrose-Oji. B. (2009). Urban Food Systems and African Indigenous Vegetables: Defining the Spaces and Places for African Indigenous Vegetables in Urban and Peri-Urban Agriculture. In *African indigenous vegetables in urban agriculture*, edited by C.M. Shackleton, M. Pasquini, and Drescher. London: Earthscan. 1 – 33. ISBN 978-1-8440-7715-1.

Asogwa, B.C.; and Okwoche, V.A. (2012): Marketing of Agricultural Produce among Rural Farm Households in Nigeria: The case of Sorghum Marketing in Benue State. *International Journal of Business and Social Sciences*, 3(13):269-227.

Baruwa, O.I. (2013). Profitability and Constraints of Pineapple Production in Osun State, Nigeria. *Journal of Horticultural Research.* 21(2):59–64.

Effiong, E.O (2005). Efficiency of Production in selected Livestock Enterprises in Akwa Ibom State, Nigeria. A Ph.D Dissertation, Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Nigeria.

Ekunwe, P.A, Orewa, S.I and Emokaro, C.O. (2008) Resource Use Efficiency in Yam Production in Delta and Kogi State, Nigeria. *Asian Journal of Agricultural Research*. 2008;2(2):61–69.

FAO, (2005). Addressing Marketing and processing constraints that inhibit Agri-food Experts: A guide for policy analysts and planners. FAO Service Bulletin 160.Rome, Italy.

Folayan, J.A; Oguntade, A.E; and Ogundari, K (2007). Analysis of Profitability and Operational Efficiency of Cocoa Marketing: Emperical Evidence from Nigeria. Journal of Social Sciences, vol 2 (5):46-48.

Idiong IC (2006). Evaluation of Technical, Allocative and Economic Efficiencies in Rice Production System in Cross Rivers State, Nigeria. A Ph. D Dissertation, Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Imo State, Nigeria. pp75.

IITA (2001). Maize crop. International Institute of Tropical Agriculture (IITA) Ibadan: 1-3.

Johnson, N., Ravnborg, H.M., Westermann O. and Probst, K., (2002) User participation in watershed management and research. Water Policy 3(6): 507-520.

Lenné, J.M., and A.F. Ward. (2010). Improving the efficiency of domestic vegetable marketing systems in East Africa Constraints and opportunities. *Outlook on Agriculture* 39(1): 31-40.

Lyatuu, E., G. Msuta, S. Sakala, M. Maope, S. Ketseemang, and L. Lebotse. (2009). Marketing indigenous leafy vegetables and how small-scale farmers' income can be improved in the SADC region (Tanzania, Zambia and Botswana). Final Marketing Report of Joint SADC-

Muhammad, S; Umar, F; and Waqar, M (2005). Citrus Marketing in Punjab: Constraints and Potential for Improvement. *The Pakistan Development Review*, 44:4 Part II, pp 673-694.

Nyiatagher, Z.T and Ocholi, A. (2015). Profitability and Marketing Efficiency of Maize In Kwande Local Government Area of Benue State, Nigeria. *Journal of Research in National Development*, 6(3): 6-9.

Ogungbile, A.O, Tabo, R and Rahman, S.A.(2002) Factors affecting Adoption of ICSV 111 and ICSV 400 Sorghum Varieties in Guinea and Sudan Savanna of Nigeria. *Plant Scientist*. 2002;3:21–32.

Oladejo, J.A. and Sanusi, W.A. (2008). Marketing analysis of plantain in Owo and Ose Local Government Areas of Ondo State, Nigeria. *International Journal of Agricultural Economics & Rural Development*, 1(2): 93-101.

Oladejo, J.A. (2015). Profitability and Structural Analysis of Cashew Nut Marketing in Oyo State – Nigeria. *International Journal of Agricultural Policy and Research*, vol 3 (3), pp 114-221.

Orji, B.A. (2007). Analysis of Profitability and

Operational Efficiency of tomatoe Marketing: Emperical Evidence from Nigeria. *Journal of Social Sciences*, vol 2 (7):36-43.

Ovharhe, J.O, Okoedo-Okojie, D.U (2011). Assessment of Agricultural Information Communication among Pig Farmers in Delta State, Nigeria. *In:* Erhabor PO, Ada-Okungbowa CI, Emokaro CO, Abiola MO (eds). From Farm to Table: Whither Nigeria. Proceedings of the 12th Annual National Conference of National Association of Agricultural Economists (NAAE). 518–523.

Singh, B. P. (2002*)* Non-traditional crop production in Africa for export. In Janick, J. and A.

Tschirley, D., Muendo, K.M. and Weber, M.T (2004) Improving Kenya>s domestic horticultural production and marketing system: current competitiveness, forces of change, and challenges for the future Volume II: Horticultural marketing. Working paper No. 08B/2004 of the Tegemeo Institute of Agricultural Policy and Development, Egerton University, Nairobi.

Ugwumba, C.O.A (2009): Analysis of fresh Maize Marketing in Anambra State, Nigeria. *Journal of Research in National Development*, 7(2): 1-5.

Ugese, F.D; Iyango, P.O and Swem, T.J (2012). Mango fruits production and production constraints in Gboko LGS, Benue State. *Publication of Nasarawa State University, Keffi.* 4(3): 43-57.

USAID. (2009). ―AGCLIR: Nigeria, Nigeria Rice Value Chain. Booz Allen Hamilton.

USAID. (2009). ―AGCLIR: Liberia, Liberia Rice Value Chain.

USAID, (2005) Global Horticulture Assessment. University of California, Davis.