



ANALYSIS OF MANGO MARKETING IN OGBOMOSHO, OYO STATE, NIGERIA

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ABSTRACT

This study examines marketing of mango in Ogbomosho Oyo state, Nigeria. It emanated from the need to quest for nutritional security and healthy living. Primary data collected from 120 respondents (comprising 50 wholesalers and 70 retailers) were used for the study. The data were analyzed with descriptive statistics, Gini-coefficient, regression model and five-point Likert scale. The results show that mango marketing is undertaken mainly by middle aged married women who derive their capital from informal sources. The result further revealed that marketing of mango follows a decentralized structure in the study area. The market margin at wholesale and retail levels was ₦216,782 and ₦25,151 per month respectively, implying that marketing of mango is a profitable venture in the study area. The significant factors influencing profitability of mango in the study area are age ($p < 0.1$), membership of cooperative ($p < 0.05$), marketing experience ($p < 0.1$) and marketing costs ($p < 0.01$). The major constraints militating against efficient marketing of mango in the study area were high level of perishability, poor storage facilities, lack of credit, inadequate capital, seasonal variation and high cost of transportation. The marketers should form cooperatives and be provided with credit facilities. Also, policies that will reduce cost of transportation should be implemented and efficient technologies for preserving the fruit be developed.

Keywords: Nutritional security, Mango, Profitability, Marketing, Constraints

1.0 INTRODUCTION

Fruits are essential part of a healthy diet. Some studies have shown that higher consumption level of fruits has a strong correlation with better quality of life and higher life expectancy [1 & 2]. They are extraordinary dietary sources of nutrients, micronutrients, vitamins and fibre for humans and are thus vital for health and well-being. Well balanced diets, rich in fruits, are especially valuable for their ability to prevent vitamin A and C deficiencies and are also reported to reduce the risk of several diseases [3]. One of the fruit crops of nutritional value and high potential for income generation is mango (*Mangifera indica*). It is a large fleshy drupe, highly variable in size, shape, colour and taste and weighing up to 1 kg in some cultivars. The fruit is native to South Africa from where it has been distributed worldwide to become one of the most cultivated fruits in the tropics, including Nigeria [4]. It is a rich source of vitamins A, B, C, E and K and numerous micro and macro minerals. Good mango varieties contain 20% of total soluble sugars and protein content is about 1% [5]. Mango varieties that are too fibrous or too soft for fresh consumption can be used for juice making. Thus, efficient marketing of the fruit is not only essential

for nutritional security but also a means of generating income by the traders.

Globally, the burden posed by low fruit consumption is alarming. [6] reported that 1.7 million (2.8%) deaths worldwide in 2008 are attributable to low fruit and vegetable consumption. It further noted that adequate consumption of fruits and vegetables reduces the risks for cardiovascular diseases, colorectal and stomach cancer. Therefore, unhindered accessibility to fruits is expedient for nutritional security and healthy living. Giving the nutritional value of mango and its potential for income generation, there is the need to assess its marketing. This will guide policy-makers and relevant stakeholders on ways by which its marketing can be improved upon so that the economic activities of its marketers could be promoted. It will also serve as a guide on facilitating availability of the fruit to consumers. Also, it will provide clues to the significant weaknesses and bottlenecks in its marketing system with a view to providing efficient services in the transfer of the fruit from producers to consumers. From the foregoing, the general objective of the study was to examine the marketing system for mango in Ogbomosho, Nigeria. The specific objectives were to:

- describe the socio-economic characteristics of mango marketers in the study area;
- identify the various marketing channels used by the marketers;
- determine the market structure for mango in the study area;
- determine the profitability of mango in the study area;
- examine factors influencing profitability of the fruit; and
- identify the constraints to efficient marketing of mango in the study area.

2.0 MATERIALS AND METHODS

The study area was Ogbomosho, Nigeria. It is one of the major towns in Oyo state. It lies on latitude 8° 08'N and longitude 4° 15'E and at an altitude of 329m. It is located at about 51km from Osogbo and 93km from Ibadan and 51km from Ilorin. The estimated population of Ogbomosho is about 1.2 million [7]. Ogbomosho was purposively used because of its popularity for mango marketing in southwestern Nigeria.

Data used for the study were mainly primary. The target population for this study comprises mango marketers.

Table 2.1: Sampling Procedure adopted for the Study

Location	No. of Retailers	No. of Wholesalers
Waso market	21	17
Taaki Garage	7	3
Gaa mashifa	4	1
Arada	10	6
Oja Oba	23	21
Alalubarika market	5	2
Total	70	50

Source: Field survey, 2014

Table 2.1 shows the sampling procedure used for the study. The sampling techniques involved random sampling of six locations in the study area and proportional sampling of fifty (50) wholesalers and seventy (70) retailers, each across the six locations making a total of one hundred and twenty (120) respondents across the locations selected. Descriptive tools such as percentages, frequency distribution, averages and ranking techniques were used to analyse the socio-economic characteristics of the respondents. Illustrations and chart flow were used to describe the various marketing channels used by the marketers. The degree of concentration of mango marketers was measured by using the Gini coefficient. The index of measurement of the market share used was the total value of monthly sales following [8, 9 & 10]. The Gini coefficient is calculated as: $G.C = 1 - \sum XY$ (1)

Where

G.C = Gini Coefficient

Σ = summation sign

X = Percentage share of each class of sellers

Y = Cumulative percentage of their sales

The Gini coefficient ranges from zero to one and expresses the extent to which market is concentrated. A perfect equality in concentration of sellers is expected if Gini coefficient tends towards zero, while perfect inequality in concentration of sellers is expected if Gini coefficient tends towards one. If G.C = 1, market is imperfect and if G.C = 0, then market is perfect and competitive. In practice, the value lies between the two extremes [10].

Profitability of mango marketing by the traders was determined through analysis of marketing margin.

This was estimated as follows, adopting [10, 11 & 12]: $NMM = GS - TC$ (2)

$TC = TVC + TFC$ (3) Thus,

$NMM = GM - TFC$ (4)

Where:

NMM = Net market margin

GS = Gross sales

TC = Total Cost

TVC = Total Variable Cost

TFC = Total Fixed Cost

GM = Gross margin

Regression analysis was used to identify factors influencing profitability of the venture in the study area. The implicit function was expressed as:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, \mu)$

Y = Gross Margin (₦)

X_1 = Age (years)

X_2 = Marital status (1 if married, 0 otherwise)

X_3 = Household size (number of household members)

X_4 = Educational level (years)

X_5 = Cooperative membership (1 for membership and 0 otherwise)

X_6 = Marketing experience (years)

X_7 = Marketing cost (₦)

μ = error term

Four different functional forms namely; linear, semi log, double log and exponential - were fitted in order to identify the one which best explains the relationship. The best one was then chosen based on the statistical significance of coefficient of multiple determination (R^2) as indicated by the F-value, the significance of the coefficients as given by the t-values, the signs of the coefficients in consonance with *a priori* expectation and the magnitude of the standard errors. The constraints to efficient marketing by the traders were rated on a five-point likert scale as: very serious (5), serious (4), moderately serious (3), less serious (2) and not serious (1). The constraints were then ranked based on their mean values and the percentage responses.

3.0 RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of the Respondents

Table 3.1 shows the socio-economic characteristics of the marketers. The Table shows that mango marketing is dominated by the female in the study area. The dominance of the female in mango marketing activities may be due to the fact that such ventures are less strenuous and allows them to engage in domestic activities like child upbringing and housekeeping [11 & 12]. The age distribution of the respondents shows that the marketers were still in their active years. A large proportion of the marketers were married. The mean household size of the retailers and wholesalers were about five and six persons, respectively. This suggests that marketing of mango is a notable means of catering for household members by the marketers [13]. About 52% and 62.8% of the retailers and wholesalers, respectively

did not attain secondary education. This indicates a low level of formal education among the marketers

The length of time spent in any profession is an indicator of how well an individual has acquired skills over the years. About 64.3% and 94% of the retailers and wholesalers, respectively, had been in marketing of mango for over five years. Also, the mean marketing experience of seven years and nine years obtained for the retailers and wholesalers respectively suggests that marketing of mango is an age-long venture in the study area. The major sources of capital used by the marketers were personal savings and friends/relatives. Only 47.1% and 42% of the retailers and wholesalers, respectively, were members of cooperatives. This suggests that the marketers were not likely to enjoy the inherent benefits of cooperatives such as broader market opportunities, collective purchase, easy access to credit facilities and reduced marketing costs/increased income [12].

Table 3.1: Socio-economic Characteristics of the Respondents

Variable	Retailers Frequency (N=70)	Percentage (%)	Mean	Wholesalers Frequency (N=50)	Percentage (%)	Mean
Gender						
Female	68	97.1		29	58	
Male	2	2.9		21	42	
Age (years)			42.6			49.8
≤ 30	7	10.0		0	0	
31-40	24	34.3		2	4	
41-50	23	32.8		23	46	
51-60	13	18.6		25	50	
>60	3	4.3		0	0	
Marital Status						
Single	1	1.4		1	2	
Married	59	84.3		40	80	
Widowed	10	14.3		9	18	
Household size			5.3			5.5
≤ 2	1	1.4		1	2	
3 – 5	42	60.0		23	46	
6 – 8	25	35.7		26	52	
9 and above	2	2.9		0	0	
Educational Level						
No formal education	19	27.1		2	4	
Primary education	25	35.7		24	48	
Secondary education	24	34.3		20	40	
Tertiary Education	2	2.9		4	8	
Marketing Experience (years)			7			9
1 – 5	25	35.7		3	6	
6 – 10	28	40.0		34	68	
> 10	17	24.3		13	26	
Source of Capital						
Personal savings	49	70.0		21	42	
Friends/relatives	11	15.7		17	34	
Money lenders	8	11.4		5	10	
Banks	0	0		3	6	
Cooperatives	2	2.9		4	8	
Cooperative Membership						
Members	33	47.1		21	42	
Non members	37	52.9		29	58	

Source: Field Survey, 2014

3.2 Marketing Functions Performed by the Respondents

The functions performed by market participants may go a long way in determining how efficient the marketing of a commodity is and its conduct. Table 3.2 shows the various marketing functions carried out by the respondents. Results from the Table show that most of the retailers obtained their supply from wholesalers (41.4%) and commission agents (51.4%) while the wholesalers mostly obtained theirs from farmers/producers (58%) and commission agents (36%). Few of the retailers (7.1%) obtained their supply from farmers/producers while only 6% of the wholesalers obtained theirs from other wholesalers. Sources of market information such as transporters/drivers, radio/television and

posters/leaflets were not commonly used. Most of the marketers got market information from other marketers, as this accounted for 84.3% and 72% of the retailers and wholesalers respectively. The implication of this source of market information could be that they got detailed firsthand information without any cost and also in time [9]. The means of communication was mostly through mobile telephones (GSM) and personal contact (verbal messages) with other marketers.

The major modes of transportation used by the retailers and wholesalers were taxi (87.1%) and bus (86%). All the wholesalers used baskets of various sizes as their unit of measurement while most (82.9%) of the retailers sell in units or counts.

Table 3.2: Marketing functions performed by the marketers

Variable	Retailers Frequency (N=70)	Percentage	Wholesalers Frequency (N=50)	Percentage
Source of Supply				
Farmers/Producers	5	7.1	29	58
Wholesalers	29	41.4	3	6
Middlemen/Commission agents	36	51.4	18	36
Unit of Measurement				
Basket	24	34.3	50	100
Counts	46	65.7	0	0
Mode of Transport				
Taxi	61	87.1	3	6
Bus	6	8.6	43	86
Motor Cycle	3	4.3	0	0
Truck/Lorry	0	0	4	8
Sources of Market Information				
Transporters/Drivers	7	10	9	18
Radio/Television	3	4.3	4	8
Posters/Leaflets	1	1.4	1	2
Other Marketers	59	84.3	36	72

Source: Field Survey, 2014

3.3 Marketing Channels Used by Respondents in the Study Area

The route taken by goods as they move from producers/farmers to consumers is called the

marketing channel. [14] pointed out that the channel helps in assessing the importance and performance of marketing system. The marketing channel for mango in the study area is shown in figure 3.1.

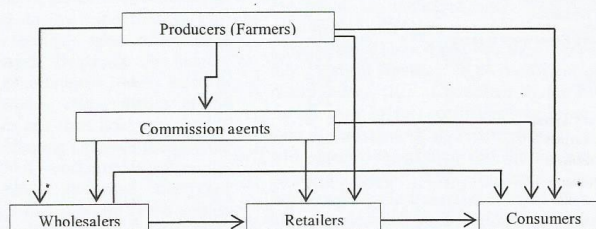


Figure 3.1: Marketing Channels for Mango in the Study Area

Source: Field Survey, 2014

As shown in Figure 1, the following marketing channels for mango are identified in the study area:

- Producers → Commission agents → Wholesalers → Retailers → Consumers
- Producers → Wholesalers → Retailers → Consumers
- Producers → Commission agents → Retailers → Consumers
- Producers → Retailers → Consumers
- Producers → Consumers
- Wholesalers → Consumers
- Commission agents → Consumers
- Retailers → Consumers

This indicates that there is a decentralized marketing channel for mango in the study area.

3.4 Market Concentration of the Respondents

The results of Gini coefficient analysis for retailing and wholesaling are shown in Tables 3.3 and 3.4 respectively. The mean values of monthly sales by the retailers and wholesalers were ₦56,057.14 and ₦588,508.00 respectively. The Gini coefficient of the retailers and wholesalers were about 0.55 and 0.48 respectively. This indicates a high level of inequality in mango marketers' monthly income and hence a high level of concentration in the study area. It also suggests a higher income inequality and level of concentration in retailing than wholesaling. These values further indicate that marketing of mango in the study area approaches perfect competition and no single individual or organisation can influence the market. However, these values imply that there is a greater income inequality and market concentration for retailers than for wholesalers.

Table 3.3: Gini Coefficient for Mango Retailers by Monthly Sales in the Study Area

Monthly Sales Range (₦)	Number of Retailers	% of Retailers (X)	Cum. % of Retailers	Total Value of Monthly Sales (₦)	% of Total Sales	Cum. % of Total Sales (Y)	ΣXY
1-15000	1	1.43	1.43	14,400	0.37	0.37	0.00005
15001-30000	13	18.57	20.00	303,400	7.73	8.10	0.01504
30001-45000	11	15.71	35.71	384,800	9.81	17.91	0.02814
45001-60000	14	20.00	55.71	715,200	18.23	36.14	0.07228
60001-75000	11	15.71	71.42	738,800	18.83	54.97	0.08636
75001-90000	11	15.71	87.13	881,600	22.47	77.44	0.12165
90001-105000	7	10.00	97.13	665,800	16.97	94.41	0.09441
105001-120000	2	2.86	100.00	220,000	5.61	100.00	0.02860
Total	70	100.00		3,924,000	100.00		0.44654

Mean value of retailers monthly sales = ₦56,057.14

Retailers' Gini coefficient = $1 - 0.44654$
 $= 0.55346$
 ≈ 0.55

Source: Field Survey, 2014

Table 3.4: Gini Coefficient for Mango Wholesalers by Monthly Sales in the Study Area

Monthly Sales Range (₦)	Number of Wholesalers	% of Wholesalers (X)	Cum. % of Wholesalers	Total Value of Monthly Sales (₦)	% of Total Sales	Cum. % of Total Sales (Y)	ΣXY
150001-300000	1	2	2	252,000	0.86	0.86	0.00017
300001-450000	11	22	24	4,445,600	15.11	15.97	0.03513
450001-600000	17	34	58	8,731,000	29.67	45.64	0.15518
600001-750000	10	20	78	6,277,200	21.33	66.97	0.13394
750001-900000	6	12	90	4,793,600	16.29	83.26	0.09991
900001-1050000	4	8	98	3,870,000	13.15	96.41	0.07713
1050001-1200000	1	2	100	1,056,000	3.59	100.00	0.02000
Total	50	100		29,425,400	100.00		0.52146

Mean Value of wholesalers monthly sales = ₦588,508.00

Wholesalers' Gini coefficient = $1 - 0.52146$
 $= 0.47854$

$\cong 0.48$

Source: Field Survey, 2014

3.5 Profitability of Mango Marketing in the Study Area

Table 3.5 presents the analysis of profitability of mango marketing in the study area. On the average, the purchase value of mango by the retailers and wholesalers were ₦30,906 and ₦371,726 per month, respectively. The average total marketing cost incurred per month by the retailers and wholesalers respectively were ₦6,593 and ₦65,780.

At the retail and wholesale levels, it was sold at an average value of ₦56,057 and ₦588,508 per month respectively. This resulted in market margins of

₦25,151 and ₦216,782 per month at retail and wholesale levels respectively. The result obtained for the market margins implies that mango marketing is profitable, if compared with minimum wage of the Federal Civil Service of ₦18,000 per month. Mango marketing could therefore be said to be a worthwhile venture in the study area.

The farmers' (gatherers') shares were 55.13% and 63.13% respectively for retailers and wholesalers. This implies that 45.87% and 37.87% respectively of mango consumers' expenditure go to the marketing system.

Table 3.5: Analysis of profitability of mango marketing in the study area

Cost/Revenue Items	Retailers (Average Amount ₦/month)	Wholesalers (Average Amount ₦/month)
Purchase price of mango (W)	30,906	371,726
Marketing costs		
Variable Cost		
Transportation cost	5,280	51,084
Packaging material	742	—
Loading and off-loading cost	—	11,550
Fixed Cost		
Rent	—	2,146
Sanitation fee	571	1,000
Total marketing cost (X)	6,593	65,780
Total Cost	37,499	437,506
Selling price (Y)	56,057	588,508
Gross market margin (Z) [Z = Y - W]	25,151	216,782
Marketing margin (Net marketing margin) [Z - X]	18,558	151,002
Gross marketing margin as percentage of selling price	44.87	36.84
Gatherers'/farmers' share (%)	55.13	63.16
Marketing efficiency (%)	49.49	34.51

Source: Field Survey, 2014

3.6 Factors Influencing Profitability of Mango Marketing in the Study Area

Table 3.6 shows the results of the regression analyses to determine factors influencing profitability of mango in the study area. The double-log function was chosen as the lead equation based on the R², F-value, number of significant variables and its consonance with *a priori* expectations. The model showed that four factors namely; age, membership of cooperative, marketing experience and marketing costs are the significant factors influencing profitability of mango marketing in the study area. The coefficient of age of the marketers was negative and significant. This means that younger marketers are likely to make more profit from the venture than their old counterparts. This could be as a result of high level of innovativeness in agricultural marketing among the youth [15]. Membership of cooperative was positively and significantly related to profitability among the traders. This implies that

those who are members of cooperative are likely to make more profit than those who are not. This could be as a result of the economics of scale enjoyed by members of cooperatives in terms of bulk purchase which in turn reduces per unit cost of purchase. Besides, members of cooperative are likely to source credit on collective basis and this could increase their volume or quantity of mango traded and thus expand their enterprise [16].

The coefficient of marketing experience of the traders was positive and significant at 1%. This means that as the marketing experience of the traders (proxied by the number of years in marketing) increases their profitability increases. Experienced marketers are much likely to have increased knowledge about techniques or otherwise involved in any enterprise [17]. As expected, however, the marketing costs incurred by the traders was inversely related to profitability of their enterprise ($p < 0.01$).

Table 3.6: Result of the regression analysis on factors influencing profitability of mango marketing by the respondents

Variables	Linear	Semi-log	Double log ⁺	Exponential
Constant	9.451 (-0.14)	9.303 (-3.64)	6.448 (-2.51)	8.1651 (9.27)
Age	0.151(0.20)	0.035 (1.03)	-0.721 (-1.88)*	0.0400 (1.81)*
Marital Status	0.412(0.12)	0.418 (0.03)	-0.192 (-0.38)	-0.0667 (-0.32)
Household Size	-0.305 (-0.47)	0.494 (0.32)	0.188 (0.54)	-0.0006 (-0.01)
Educational Level	-0.719 (-0.73)	-0.277 (-0.24)	0.349 (1.54)	0.1736 (1.89)*
Cooperative membership	0.310 (1.87)*	0.08 (1.97)**	0.011 (2.04)**	-0.2328 (-1.37)
Marketing experience	0.079 (0.01)	0.62 (1.00)	0.904 (1.89)*	0.0354 (1.35)
Marketing Cost	-0.635 (9.63)***	-0.045 (8.57)***	-0.487 (9.92)***	-0.704 (10.64)***
R ²	0.5610	0.5204	0.6731	0.6617
Adjusted R ²	0.5336	0.4904	0.6506	0.6404
F-Value	20.45	17.36	28.58	25.02

Note: a(b), a = coefficient; b = t-value; *lead equation;

* represents significance at 10%

** represents significance at 5%

*** represents significance at 1%

Source: Field Survey, 2014

3.7 Constraints to Efficient Marketing by the Traders

Table 3.7 shows the challenges faced by the traders in the study area. The major problems were high level of perishability (mean score = 4.71), poor

storage facilities (mean score = 4.53), lack of credit (mean score = 4.32) and inadequate capital (mean score = 4.23). Others were seasonal variation (mean score = 4.10) and high transportation cost (mean score = 3.89).

Table 3.7: Constraints to Efficient Mango Marketing in the Study Area

Factors	Very severe	Severe	Moderate/y severe	Less severe	Not severe	Mean score	Rank
Inadequate capital	36 (30.0)	76 (63.3)	8 (6.7)	0 (0.0)	0 (0.0)	4.23	4
Lack of credit	40 (33.3)	78 (65.0)	2 (1.7)	0 (0.0)	0 (0.0)	4.32	3
High level of perishability	85 (70.8)	35 (29.2)	0 (0.0)	0 (0.0)	0 (0.0)	4.71	1
High transport cost	27 (22.5)	57 (47.5)	32 (26.7)	4 (3.3)	0 (0.0)	3.89	6
Bad roads	3 (2.5)	14 (11.7)	39 (32.5)	46 (38.3)	18 (15.0)	2.48	8
Long distance to market	0 (0.0)	9 (7.5)	38 (31.7)	54 (45.0)	19 (15.8)	2.31	9
Bulkiness	2 (1.7)	24 (20.0)	45 (37.5)	33 (27.5)	16 (13.3)	2.69	7
Poor storage facilities	69 (57.5)	47 (39.2)	3 (2.5)	0 (0.0)	1 (0.8)	4.53	2
Seasonal variation	27 (22.5)	80 (66.7)	11 (9.2)	2 (1.7)	0 (0.0)	4.10	5

Note: x(y): x = No of respondents; y = Percentage

Source: Field Survey, 2014

4.0 CONCLUSION

It can be concluded from this study that marketing of mango in the study area is undertaken mainly by middle aged married women who derive their capital from informal sources and are mostly not members of cooperative societies. Marketing of mango by the traders follows a decentralized structure. The study further reveals that marketing of mango is a profitable venture. The factors influencing profitability of mango in the study area are age, membership of cooperative, marketing experience and marketing costs. The study further shows that high level of perishability, poor storage facilities,

lack of credit, inadequate capital, seasonal variation and high cost of transportation are the major constraints militating against efficient marketing of mango in the study area.

Based on these findings, therefore, there is the need to put measures that will encourage young individuals to participate in this venture. Also, government authorities, non-governmental organisations (NGOs) and development agencies should enhance the economic power of the traders by empowering them through micro credit facilities to supplement their personal savings. Besides,

membership of cooperatives should be encouraged among the traders. This will not only enable the traders to tackle their common problems but will also help them to have much access to credit from formal institutions rather than on individual basis. Also, strategies that will reduce the rate of perishability of the fruit should be put in place. In this vein, research agencies and institutes should develop efficient technologies for preserving mango in order to prolong its shelf life. Policies that will reduce cost of transportation should be implemented in the study area.

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