

APPLICATION OF MOBILE PHONES IN THE MARKETING OF BANANA IN ONDO STATE, NIGERIA

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Abstract

This paper studied the application of mobile phones in the marketing of banana in Ondo State, Nigeria. Banana is a major tropical fruit, consumed widely for its taste, texture, energy, digestibility and cost-effectiveness across major towns and rural communities in Ondo State, Nigeria. Given the high perishability of the crop, mostly when ripe, banana marketers who are mostly women employ mobile phones in banana marketing. The data collected from one hundred and eighty (180) banana marketers across three (3) Local Government Areas (LGAs) were analysed using descriptive statistics, marketing margin and multiple regression model. The study revealed high use of mobile phones among banana marketers with majority using more than one GSM service providers. Retailer and wholesaler marketing margins were high with retailer margin (64%) greater than wholesaler margin (36%). The regression results indicated that only education and amount of banana sales positively influenced the marketers' use of mobile phones.

Key words: GSM service providers, marketing margin, mobile phones, Nigeria, regression model

INTRODUCTION

The banana (*Musa sapientum*, known as true banana) has its origin in southwest Asia. Banana is one of the most widely grown tropical fruits, cultivated over 130 countries, along the tropics and sub tropic of Capricorn [12]. Banana is the second largest produced fruit after citrus, containing about 16% of the world's total fruit production [12]. Banana is the fourth on the developing world's list of food crops and a major staple food for millions of people throughout the tropics [8]. It can be processed in many ways such as cooking, boiling, steaming, frying, roasting, or can be dried and milled into flour [8]. In Nigeria, banana is often grated and cooked into porridge [9].

With increasing population, urbanisation, and persistent increases in food prices, banana can play pivotal roles in fighting against increasing rate of poverty [2]. This is because banana is one of the cheapest food crops to produce. It is also commonly available in many public places in southwest Nigeria

including markets, motor parks, stores and afforded by low-income earners. The characteristics intrinsic in banana aforementioned are increasingly putting banana in the limelight as household consumption fruit in southwest Nigeria.

The nutritional importance of banana

Digestibility

Banana is highly nutritious and easily digestible than many other fruits [12]. According to [18], the digestion time of banana fruit is 105 minutes which is less than that of apple with 210 minutes. Banana is popular for aroma, texture and easy to peel and eat. Besides, its richness in potassium and calcium is well-known with low sodium content [9]. These characteristics, make bananas often the first solid food fed to infants [9]

Moisture content

Moisture content in pulp increases during ripening process due to respiratory breakdown of starches into sugar and migration of moisture from peel to pulp [11]. However, in AAB variety, moisture content could be up to

68% due to presence of starchier balbisiana genome and incomplete conversion of starch into sugar [12]. Even when fully ripe, still some starch is left in pulp tissue [19] cited in [12].

Carbohydrates

During ripening process, starch is converted into sugar, through enzymatic breakdown process [12]. In AAB group (the group *M. sapientum* belongs to), starch content declines from 20-30% to 1-2%, but starch amount could be as high as 11% depending on variety [12]. Sugar content of fully mature banana is quite high and thus makes it an ideal substrate for wine making [12]. Carbohydrate type in banana is resistant starch and non-starch polysaccharides, which have low glycemic index or low digestibility [12]. This property makes it an excellent ingredient for different functional and convenience foods like cookies and chips [12].

Marketing of agricultural commodities

An agricultural market is a medium in which exchange of ownership of farm produce and allied agricultural commodities takes place. A market is an arena that provides the much needed interaction of the forces of demand and supply, irrespective of the physical location of buyers and sellers [13]. It aims at organising and facilitating business activities and answering the basic questions of what to produce, for whom to produce it for, and how to produce and distribute it [13].

Marketing margins

Marketing margins represent the difference in price paid to the first seller and that paid by the final buyer [1]. Marketing margin is also the difference between the purchase price and the price received on sale [13]. Every category of middleman earns a sort of margin for the duties performed in the marketing channel [1]. The difference is usually made up of the margins taken by wholesalers and retailers, plus transport and other charges [1]. Marketing margins can be measured using different approaches but [13] identified three approaches of measuring marketing margin in monetary terms. The first approach identified by [13] is taking a representative supply of a product from a given rural market and tracing what happens to it through the marketing

system. Price changes are noted at each stage and the average is derived. The second approach identified by [13] is the number of units handled divided by the gross receipts and outflows along a marketing channel. Margins from each intermediate stage can then be added to obtain the overall margin [13]. The third approach by [13] is by comparing prices at the different levels of marketing; this, however, depends on the availability of representative and comparable series of prices at each level [13].

Use of mobile phones in agricultural marketing

The application of mobile phones in agriculture and in particular agricultural marketing is re-defining the concept of agricultural marketing. Mobile phone use in agricultural marketing has provided impetus, speed, reduced chains of middlemen to traditional marketing and reduced post-harvest losses characteristic of the traditional marketing of farm produce. Small, medium and large scale marketing businesses, as well as farmers, who many a times are involved in the direct distribution and marketing of their farm produce are tremendously shifting their focus to use of mobile phones and associated services in areas of transportation and distribution, sales, purchases and networking. A report by Vodafone and Accenture, for instance, noted that mobile phone-enabled solutions for food and agriculture could assist producers to access financial services, obtain agricultural information, improve data visibility for supply chain efficiency and enhance access to markets [7] and [20].

Mobile phones and banana marketing

Banana comes in different sizes as it is distributed and marketed from the farmer to the consumer, through the activities of wholesalers and retailers. Banana is often sold in measures of bunches. However, the term bunch (Photo 1) applies to the large hanging cluster, which is made up of different tiers with up to 20 fruits in a tier. Depending on varieties and other factors, the bunch may comprise from 3 to 20 tiers. It is this the bunch that is commonly referred to commercially as "banana stem". Average weight of the bunch ranges from 30 to 50kg.

According to Research and Statistics Department of the Ministry of Economic Planning and Budget, Ondo State's report for 2011, the average size of banana bunch in the study area is 32 kg [16].

The tiers (Photo 2) also called "hands" (because of its characteristic human hand appearance) make up the bunch or the banana stem. The hands comprise of pieces of banana also called a banana or also a "finger". Retailers often sell ripe banana in the study area in tiers or hands. The tiers have also been erroneously referred to as banana bunch.



Photo 1. Unripe banana bunch also commercially known as banana stem

Source: retrieved from http://www.123rf.com/stock-photo/bunch_of_bananas.html



Photo 2. Ripe banana tier also known as banana hand
Source: retrieved from http://www.123rf.com/photo_8738987_bunch-of-bananas-isolated-on-white-background.html

Mobile phones and banana marketing

The very high perishability of banana, particularly when ripe, makes the use of mobile phone marketing almost indispensable. As it will rapidly connect marketers with

established buyers with a view to obtaining their choice quantities and prices. Effective use of mobile phones in the marketing of banana has the capacity to rapidly connect marketers with buyers thus preventing deterioration or spoilage of ripe banana. It is against this background, that the study is aimed at evaluating the application of mobile phones in the marketing of banana in Ondo State, Nigeria taking bearing around the following objectives which include to:

- i. examine the socio-economic characteristics of banana marketers in the study area
- ii. investigate the use and number of GSM service providers used by banana marketers in the study area
- iii. investigate the marketing margins of banana in the study area
- iv. examine the factors influencing the use of mobile phones in banana marketing in the study area

MATERIALS AND METHODS

The study area

The study was carried out in Ondo State in southwest region of Nigeria. Three (3) Local Government Areas (LGAs) prominent for banana production and marketing were purposively selected for this study.

Sampling technique and size

Multistage sampling technique was used in the selection of the respondents for this study. In the first stage, three (3) Local Government Areas (LGAs) prominent for banana production and marketing were purposively selected for this study. The LGAs are Akure South, Akure North and Ifedore. In the second stage, two (2) major markets were randomly selected in each of the LGAs to give six (6) markets. The third stage involved the random sampling of thirty (30) banana marketers in each of the markets. In all, a total of one hundred and eighty (180) banana marketers were selected for the study.

Data and method of data collection

The primary data used for this study were collected by means of a well-structured questionnaire. The questionnaire was earlier tested in order to make sure the data were

reliable. One hundred and eighty (180) copies of the questionnaire were administered. They were also all returned completed. Collection of field data was carried out between February and April, 2015.

Data analysis

The study made use of descriptive statistics, marketing margins and multiple regression model in the analysis. Marketing margins can be expressed in cash or as a percentage of the retail cost and indicate the relative of marketing at a particular time [1]. The formula adopted for measuring marketing margin in this study was adapted from [15] and [13]. Marketing margin of banana in the study was therefore computed by the equation

$$MMb = \frac{SPb - PPb * 100}{SPb} \quad 1$$

Where:

MMb is the marketing margin of banana

SPb is the selling price of banana (often ripe)

PPb is the purchase price of banana (often unripe)

To analyse factors influencing mobile phone use, multiple regression model was used. The implicit form of the regression model is presented as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, \text{ and } X_7, e)$$

Where, Y= Use of mobile phone (measured in monthly cost)

X₁= Age of banana marketer

X₂= Sex of banana marketer (male or female)

X₃= Educational level of banana marketer (measured in years of formal schooling)

X₄ = Experience of banana marketer (in years)

X₅= Cost of mobile phone

X₆= Availability of power supply (average hours of available power per month)

X₇= Amount of banana sales (in Naira)

e = Error term

Three functional forms of the regression model were fitted to the data collected and the best fit was selected based on established criteria. The *a priori* expectation was that the

coefficients of the independent variables should be greater than zero [3] and [4].

RESULTS AND DISCUSSIONS

Socio-economic characteristics of banana marketers in the study area

The socio-economic characteristics of banana marketers in the study area as reflected in Table 1 reveals the distribution of the marketers by age, sex, educational level, and years of marketing experience in banana.

Table 1. Socio-economic characteristics of banana marketers in the study area

Socio-economic characteristics of banana marketers	Frequency (N=180)	Percentage (%)
Age of respondents (in years)		
Less than 30	12	06.67
31-40	45	25.00
41-50	58	32.22
51-60	57	31.67
Greater than 60	08	04.44
Total	180	100
Sex of respondents		
Male	11	06.11
Female	169	93.89
Total	180	100.00
Highest level of education of respondents		
No formal education	17	09.44
Primary school education	81	45.00
Secondary school education	55	30.56
Tertiary school education	12	06.67
Other forms of education	15	08.33
Total	180	100.00
Experience in banana marketing (in years)		
less than or equal to 5	45	25.00
6 to 10	75	41.67
11 to 15	32	17.77
16 to 20	14	07.78
Greater than 20	14	07.78
Total	180	100.00

Source: Computed from field survey, 2015

Most (95.66%) of the marketers were aged 60 years and below. This formed the economically active age groups. A closer analysis further reveals that many (63.89%) of the respondents were still aged 50 years and

below. Many researches have established that age is a critical factor in businesses, marketing, adoption of technologies, innovation uptake and use of information and communication technology (ICT) in such areas as mobile phones, social media and e-marketing [3] and [4]. Banana marketing in the study area could best be described as a female-affair. This is because women accounted for 93.89% of the total sample.

GSM service providers used by banana marketers in the study area

Figure 1 shows the different GSM service providers/ networks used by banana marketers in the study area. The marketers had very good spread of their choices of GSM service providers in Nigeria. Meanwhile MTN, Nigeria's foremost GSM service provider was the marketers' number one choice, followed by Glo, Etisalat and Airtel.

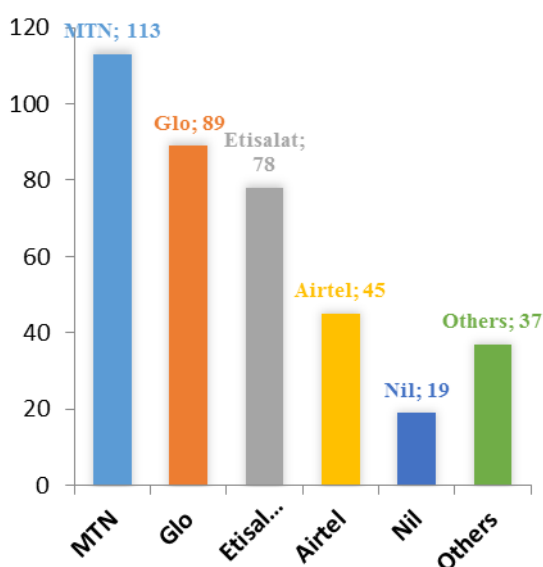


Fig. 1. GSM service providers used by banana marketers in the study area
 Source: Computed from field survey, 2015

The number of GSM service providers/ networks used by banana marketers in the study area

Figure 2 reflects banana marketers' number of GSM service providers/networks used. Almost half (47%) of the marketers used two GSM networks, while almost a quarter (23%) used more than two GSM networks, only few (19%) used only one network. In all, majority (70%) of the marketers used more than one

GSM networks. The marketers had indicated that the use of multiple networks was necessitated by poor service delivery, different tariffs, availability or non-availability of service network in a particular location or market.

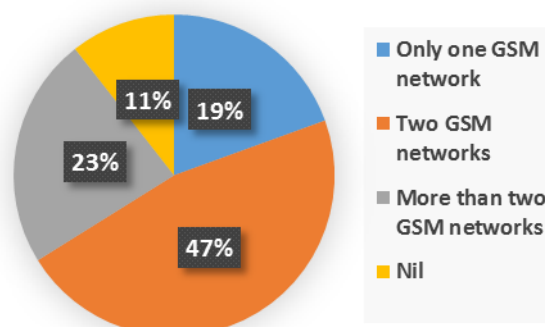


Fig. 2. Number of GSM networks used by banana marketers in the study area
 Source: Source: Computed from field survey, 2015

Marketing margins of banana in the study area

Table 2 reveals the marketing margins of banana in the study area. The retailer marketing margin which was for ripe banana was 64% while the wholesaler marketing margin which was for unripe banana was 36%. These margins were largely in discordance with [14], who observed a higher gross marketing margin for the wholesalers than the retailers in rice marketing in Abia State of Nigeria. Also, [10] revealed a higher gross and net marketing margins for the wholesalers in Abia State, Nigeria. However, the margins were similar to those of [13] for banana marketing. The higher retailer marketing margin than wholesaler marketing margin might be justified by the fact that, banana is a highly perishable fruit particularly when ripe. Since retailer sell ripe banana often, they incur more costs on quickly getting the ripe banana to final consumer before the shelf life of banana begins to deteriorate and eventual wastage. However, [17] opined that for storable and perishable goods, 5% and 10% marketing margins respectively are acceptable. The implication of this, is that, the margins received by both retailers and wholesalers in the study area were too large, indicating that banana

marketers made excessive profits. Meanwhile, higher retailer marketing margin indicated higher profit than the wholesalers. However, the indicated higher retailer profit might not be real, if retailers had more transactional costs on storage, ripening, distribution, spoilage and losses than the wholesalers.

Table 2. Marketing margin of banana marketers in the study area

Marketers	Average PPb (₦)	Average SPb (₦)	Marketing Margin (%)
Retailer (often ripe)	450	1,250	64
Wholesaler (often unripe)	330	520	36

Source: Computed from field survey, 2015

Factors influencing the use of mobile phones by banana marketers in the study area.

Table 3 shows the results of the regression analysis to examine the determinants of use of mobile phones by banana marketers in the study area. After running three functional forms, the double-log functional form provided the best fit as shown in the regression table 3. Five of the independent variables; X_1 , X_3 , X_5 , X_6 and X_7 were significant at 5% level. These variables were age, education, experience, availability of power supply and amount of banana sales. While the parameter estimates of each of these variables also carried signs, which conformed to a priori expectations [3] and [4]. However, only education and amount of banana sales positively influenced the use of mobile phones for banana marketing in the study area. The positive influence of education and amount of banana sales was an indication that more education for the marketers would increase their use of mobile phones for banana marketing and ditto for amount of banana sales. Meanwhile, the explanatory variables together explained 73% of the variations observed in the factors influencing mobile phone use in banana marketing in the study area. While 73% value of R^2 is a good one, a higher value of R^2 in the range of 80-90% as in [3] and [4] with a R^2 of 89% and 91% respectively, would mean that

less error was accommodated in fitting the regression model and or that more deterministic factors of use of mobile phones by the marketers were fitted into the regression model.

Table 3. Regression results of factors influencing use of mobile phones in banana marketing

Variables	Simple Log		Semi-Log		Double Log	
	Coefficients	T-value	Coefficients	T-value	Coefficients	T-value
X_1	-0.031 (0.021)	-1.476	-0.203 (0.182)	- 1.115	-0.479 (0.216)	- 2.218*
X_2	-0.518 (0.215)	- 2.409*	-0.181 (0.1421)	- 1.275	-0.218 (0.122)	-1.786
X_3	0.467 (0.211)	2.213*	0.421 (0.092)	4.576 *	0.453 (0.121)	3.743*
X_4	0.119 (0.157)	0.759	-0.123 (0.087)	- 1.414	0.0942 (0.073)	1.290
X_5	0.5678 (0.356)	1.595	-0.696 (0.342)	2.035 *	0.048 (0.019)	2.526*
X_6	0.412 (0.506)	0.814	0.011 (0.009)	1.222	2.877 (0.934)	3.080*
X_7	0.312 (0.212)	1.472	5.454 (2.361)	2.310 *	7.094 (1.985)	3.574*

Note: *means significant at 5% level,

Source: Computed from field survey, 2015

CONCLUSIONS

The study has been able to reveal that the use of mobile phones for marketing banana in Ondo State, Nigeria is relatively high with majority of the marketers who were mostly women using more than one GSM service providers. The reasons advanced for this, included poor service delivery, varying tariffs and availability or non-availability of service networks in a particular market or location. Meanwhile, banana marketing in the study area indicated more profit for the retailers than for the wholesalers since retailer marketing margin was greater than wholesaler marketing margin. However, both retailers and wholesaler could be described as having excessive profits owing to their large margins. On the contrary, high transactional costs could have raised the margins indicating that price mechanism in the study area requires adequate monitoring. Furthermore, only education and amount of banana sales positively influenced banana marketers' use of mobile phones. Therefore, what should be done to enhance application of mobile phones in the marketing of banana in Ondo State of Nigeria is for banana marketers to be more

educated and engage in larger volume of sales of banana.

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