



Research Paper

Economies of rubber-based farming system: A case of indigenous African pear marketing in Edo State, Nigeria

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Received 13 September 2016; Accepted 2 November, 2016

African pear is an emerging economic fruit tree that can make a great contribution to poverty reduction in communities where it is grown. Its demand is high, thus the marketing of the produce is as essential as its production because increases in production without a well-developed marketing system lead to postharvest losses of all possible gains. The study thus analyzed marketing channels and efficiency of the African pear in Edo South Local Government Area of Edo State. A multistage sampling technique was used in selecting 120 respondents within the study area. Data were analyzed using descriptive statistics and marketing margin. The major marketing channel for

the African pear was from the farmers to wholesalers and then to retailers. The result of the Market margin obtained per week in July, 2016 was N490, 766.99 with average marketing efficiency value of 2.75. The major constraint affecting the pear marketers was the perishable nature of the fruit. The study suggests that this constraint can be minimized if the marketers have access to better storage facilities like fiber baskets. This will go a long way in reducing the problem of damage during transportation of the fruits.

Key words: Pear, Marketing channel, Marketing efficiency

INTRODUCTION

African pear (*Dacryodes spp*) is mostly found in the forest zone of Africa (Awono et al., 2002; Anebeh et al., 2005) although it is grown throughout the tropics, especially in Nigeria and Cameroon, accounting for 60 – 70% of world total output (Emebiri and Nwifo, 1990). The crop belongs to the family of *Burseraceae*, is known as *Safouin* French, *ubein* Ibo, *elemi* (Yoruba), *eben* (Efik) and *orumu* (Benin) (Kengue et al., 2002; Nwokeji et al., 2005). They grow in a wide variety of climate and soil types in Africa. The gestation period for African pear is between 4-5 years after planting. In south-east Nigeria, the trees are grown around homesteads, flowering takes place between January and April. The major fruiting season is between May and October (Emebiri and Nwifo,

1990; Kengue and Nyagatchou, 1990).

The main use of *D. edulis* is its fruit, which can be eaten raw, cooked in salt water or roasted. Cooked flesh of the fruit has a texture similar to butter. The pulp contains 48% oil and a plantation can produce 7-8 tons of oil per hectare (Awono et al., 2002). It is also rich in vitamins. The kernel can be used as fodder for sheep or goats. The beautiful flowers are useful in apiculture as it attracts bee for its nectar. The wood of *D. edulis* is generally used for tool handles, and occasionally for mortars, and is also suitable for carpentry works. The seed of *Dacryodes edulis* is rich in different proportions of carbohydrates, proteins, and crude fibers, appreciable amounts of potassium, calcium, magnesium and

phosphorus (Emebiri and Nwafo, 1990). It is also rich in essential amino acids and a considerable amount of fatty acids. The tree is also a source of many herbal medicines especially among Edo people. It has long been used in the traditional medicine of some African countries to treat various ailments such as wound, skin diseases; dysentery and fever. The resin is sometimes burnt for lighting or used as a glue (Onuegbu et al., 2011).

Rubber - based farming system is the description of intercropping rubber with a different types of crops especially high value indigenous crops like cassava, maize, cocoyam, pawpaw, and some medicinal plants and mini-livestock on the same piece of land in a spatial arrangement that permits optimal growth and performance of the different components of the system. In this study, indigenous African pear (*Dacryodesedulis*) tree crop which contributes to food security, medicine, income and environmental services among Edo people was examined. Some rubber farmers in Edo South Local Government Area planted the African pea on the periphery of their farm borders at about 10m away from the rubber plantation. This is avoid interference of pea and rubber trees. This system serves as a wind break to protect the rubber trees as the African pea resists wind blow more than the rubber trees.

Agricultural marketing can be seen as part of agricultural production without which it (agriculture) will remain stagnant. It dictates how often or how much the producer will increase his produce based on the market demands. Thus, marketing of native pear is as essential as its production since an effective marketing system helps to harmonize demand and supply and stimulate production. Production increases without a well-developed marketing system will lead to all possible gains from the production effort going into the drains of postharvest. Thus, the study analyzed the marketing channels and efficiency of the marketing system of African pear in Edo South Local Government Areas of Edo State: The specific objectives were to:

- (i) Examine the socio-economic characteristics of respondents.
- (ii) Examine the marketing channel of pear in the study area.
- (iii) Analyze the marketing margin and efficiency of African pear marketing among the respondents.
- (iv) Identify major constraints that affect marketing of African pear in the study area.

MATERIALS AND METHODS

Study Area

The study was conducted in Edo South L.G.A of Edo States Nigeria. Edo State lies between Latitudes 5° 44’ and 7° 34’ N of the equator and between Longitudes 5° 04’ and 6 ° 43’ E of the Greenwich Meridian. It shares

boundary in the south with Delta State, in the West with Ondo State and in the East with Kogi and Anambra States (Edo State Government, 2014). The State covers a land area of about 17,902 km² with a population of 3,218,332. The State has 18 Local Government Areas (National Population Commission NPC, 2006). Vegetation identified in the State is mangrove forest, fresh swamp and Savannah vegetation. The mean annual rainfall in the northern part is 1270 mm to 1520 mm while the southern part of the State receives about 2520 mm to 2540 mm rainfall respectively. Mean temperature in the State ranges from a minimum of 24°C to a maximum of 33°C (Edo State Government, 2014). The people of the State are mostly farmers growing a variety of crops such as cassava, rice, yam, plantain, pineapple and tree crops such as rubber, oil palm, cocoa and the African pea.

Sampling procedure

A multi-stage sampling technique was used in the study. The first stage was a purposive sampling of Edo South LGA. The selected based on the volume of production of Africa pear produced in the area. The second stage was also a purposive selection of 6 major markets in the LGA, namely- New Benin market, Udo Market, Oba market, Iguobazuwa market, Koko market and Ikpoba hill market. In the third stage, a questionnaire was administered on 20 African pea marketers randomly selected in each of the selected markets, totaling 120 respondents selected. All the respondents filled the questionnaires correctly, hence all used for this study.

Data analyses

Descriptive statistics as well as marketing margin and efficiency analysis were used to achieve objectives in this study. Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. The term market margin is commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain, for example differences between producer and wholesale, or wholesale and retail, prices (Amao et al., 2011). Marketing efficiency is essentially the degree of market performance. Marketing margin was thus calculated as follows:

$$MM=TR-TM.....(1)$$

Where;
 TR = Total Revenue;
 TMC = Total Marketing Cost;

MM = Marketing Margin.

Marketing efficiency was calculated thus:

$$ME = \frac{TR}{TMC} \dots\dots\dots(2)$$

Where

ME = Marketing efficiency.

TMC = Total marketing costs; includes cost price in Naira; cost of basket, cost of transportation in Naira and other miscellaneous costs.

TR = Total Revenue (Sales revenue).

RESULTS AND DISCUSSION

Demographic Characteristics of the Respondents

The age distribution of the respondents revealed that 10% were 20 years and below of age, 62% were between 21 and 40 years, 21% were between 41 and 60 years while 7% were aged between 61 and 80 years. These indicate that most of the respondents (93%) were in their active economic years, hence participated actively in the marketing of African pea activity. Virtually almost all the respondents are female (98%) while the remaining 2% are male, an indication that the women dominates the pear marketing in the study area (Table 1).

Table 1. Distribution of respondents according to age and sex.

Age Range	Frequency	Percentage
Below 20	12	10
21 – 40	75	62
41 – 60	25	21
61 – 80	8	7
Total	120	100
Sex		
Male	2	2
Female	118	98
Total	120	100

Source: Field Survey 2016.

Table 2. Distribution of respondents according to marital status, education level.

Marital Status	Frequency	Percentage
Married	93	78
Widow	4	3
Single	23	19
Total	120	100
Education		
Informal education	19	16
Primary	75	62
Secondary	20	17
Tertiary	6	5
Total	120	100

Source: Field Survey 2016.

Table 2, about 19% of the respondents are single, 78% are married and 3% are widow, this shows that most of the respondents are responsible individuals that might have influenced them to contribute to the well-being of their families. Table 2, revealed that 16% of the respondents had informal education, 62% had primary education, 17% had secondary education and 5% of the respondent had tertiary education. This indicates that all of the respondents had one form of education or the other, which shows that they are literate, thus they are in a position to understand and adopt available innovations that would enhance good marketing productivity. The route taken by goods as they move from producer to consumer is called the channel of distribution, (Figure 1). As the product comes from the farm, through the producer, it reaches the consumers by passing through several hands like the wholesaler and retailer.

Farmers also sell to retailers as well as consumers as they sell some part of the pear at home. These channels constitute the indirect channel of distribution. It is however noted that if the producer is producing on a large scale, it may not be possible for him to sell goods directly to consumers but to the wholesalers/retailers. As such, he sells goods through middlemen. These middlemen may be wholesalers or retailers. However, when the farmer himself sells some quantity of his produce at home; it is termed a direct channel of distribution as there are no middlemen between the producer and consumer as depicted in (Figure 1). The pear fruits are usually packaged and transported in baskets and bags.

Marketing margin and efficiency

The marketing margin obtained for pear marketing in the study area was highest for marketers in Oba market which recorded N80; while N50 and N42 were marketing margin for marketers in Ikpoba hill and Koko markets respectively. Profit per kg was N60, N39, N33, and N26 for marketers in Oba, Ikpoba Hill, Koko and New Benin Markets respectively. Oba market is an urban market hence the high profit, although sale volumes were higher in the other rural markets. The marketing efficiency obtained in this study was greater than 1 (Table 3), hence is efficient and profitable. Marketing efficiency was 3.67; 3.55 and 3 for marketers in Koko, Ikpoba Hill, and New Benin Markets respectively. The marketing margin value obtained from the study implies a wide gap in prices between wholesalers and retailers indicating high profit. Although this margin is most times not attainable because of spoilage of the fruit. Despite the fact that the marketing efficiency of pear from the study was efficient (as shown in the efficiency value greater than 1), it can still be improved when steps are taken to avoid spoilage of the fruits, hence can aid in alleviating poverty among the respondents.

Table 3. Average marketing costs(in Naira per week).

Market site	Farm gate price(N/kg)	Selling Price(N/kg)	Marketing cost (N)	Marketing margin (N) (3-2)	Net marketing margin (5-4)	Marketing efficiency (%) (6/4)
New market Benin	60	100	14	40	26	1.86
Udo Market	70	90	8	20	12	1.50
Oba market	60	140	15	80	60	3.00
Iguobazuwa market	55	92	9.5	37	27.5	2.89
Koko market	58	100	9	42	33	3.67
Ikpoba market hill	40	90	11	50	39	3.55

Average Quantity of African pears marketed per week in the study are 262,434.89 kg.
 Source: Calculated from Field Survey, 2016

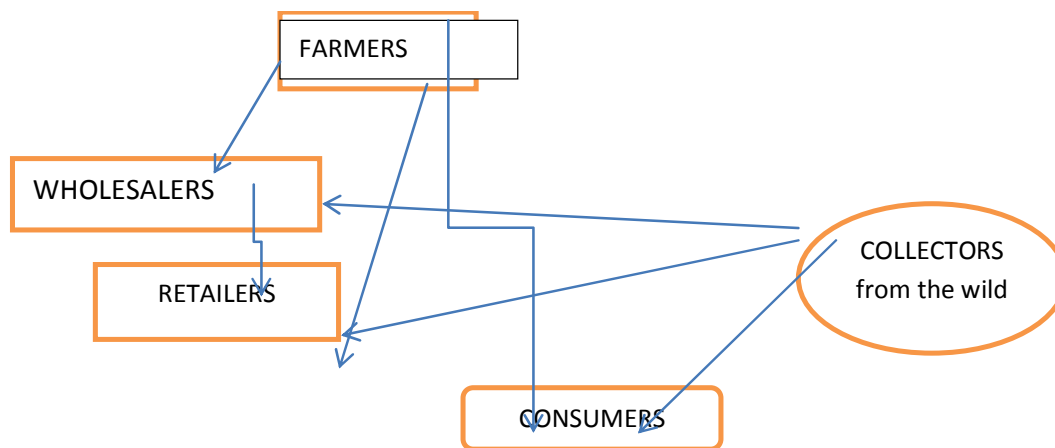


Figure 1. Marketing channel of pineapple.

Source: Field Survey, 2016.

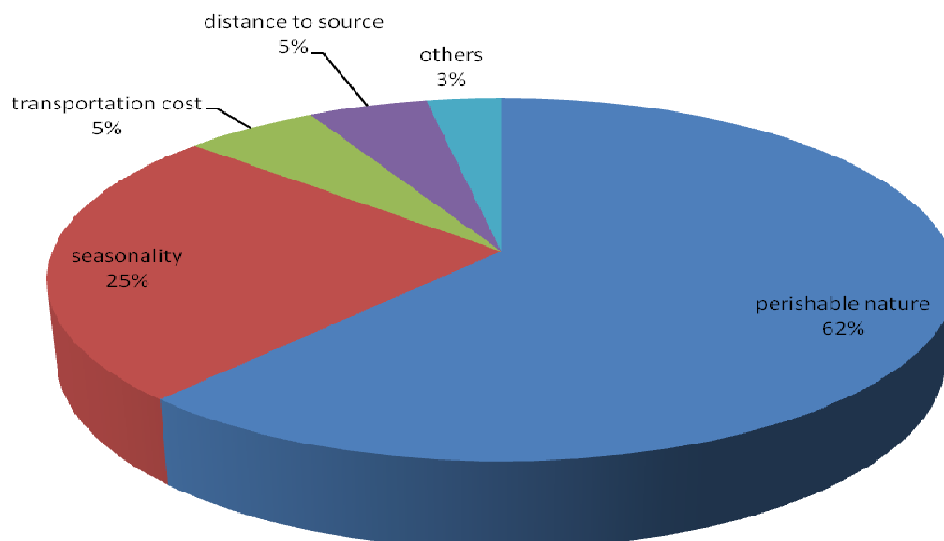


Figure 2. provide title
 Source: Field Survey, 2016

Constraints to African pear marketing

From the survey, perishable nature of pear is the major constraint to its marketing accounting for 62%; in addition to its seasonality (25%); distance to source and transportation cost (5%) as shown in (Figure 2). Marketing of Native pear is quite complex and risky due to the perishable nature of the produce, and seasonal production flowering takes place from January to April. The major fruiting season is between May and October (Emebiri and Nwufo, 1990; Kengue and Nyagatchou, 1990). The study revealed that the major constraint to marketing is perishability which among other things can be due to how the fruit was harvested, handled, transported and stored before taking to the market for sale.

CONCLUSION AND RECOMMENDATION

The tree of *D. edulis* starts to produce between 4-5 years after cultivation. The fruits are harvested and transported to the market within 24 hours because of its very rate of perishability. Farmers sell a large percentage of their produce at the farm-gate. They sell these to wholesalers who take the pear to distant markets within and outside Edo state. Marketing of pear in the study area was found to be efficient and profitable, hence can aid poverty alleviation. Based on the findings from this study marketing can be more efficient if the constraint of perishability is reduced. This can be controlled by having access to storage facilities which can reduce the problem of damage during transportation of the fruits.

AUTHORS' DECLARATION

We declare that this study is an original research by our research team and we agree to publish it in the journal.

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