

Evaluation of uses and marketing potential of *Spondias mombin* Linn. (hog plum) in Ibadan metropolis

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Abstract

The study focused attention on non-timber forest products (NTFP) with emphasis on marketing of one of the notable tree plants---*Spondias mombin*. This could not have been more apt considering the enormous potentials uses of the plant in the area of fencing, nutrition, curative potencies for numerous illnesses like malaria, stomach ache, cough etc and several spiritual and aesthetics attachments mostly in the tropical African settings. It is of grave irony that despite various uses to which this plant can be harnessed into, the art of cutting and destruction of tree plants by man have not spared this wonderful gift of nature. It revealed the peculiar nature of *Spondias mombin* marketing in Ibadan metropolis as gender-driven with 95.59% of the respondents selected from two-stage (purposive and random) sampling techniques being female and modal age of 64.71% in the range of 41-50yrs. The traders are all Yoruba. The level of education of the traders overlaps between the primary and secondary. The products comes from various sources far and near to the wholesaler/retailer and the profitability measured using the Return on Investment index (ROI) showed that trading in *Spondias mombin* is a profitable venture at 116.6%. That is, for every one naira invested in the trading, there is a net positive return of about 117kobo or ₦1.17. This however involved some constraints. Based on the above, it is recommended among other suggestions that holistic awareness programme be carried out by all tiers of government and various agencies towards total orientation of the populace on the economic benefits of this tree crop thereby securing employment window, poverty alleviation and enhancement of good health for the generality by preserving and making the art of planting economic/eco-friendly trees a profound culture and ethics in our environment.

Keywords

NTFPs, *Spondias Mombin*, Marketing, Profitability, Ibadan

1. Introduction

Environmental protection and sustainability is now the growing slogan in vogue. Though not early enough, but far better echoed consistently now than never at all towards achieving the Millennium Development Goal of securing and sustaining the stability of the habitat.

Of the numerous woody plants of the forest eco-system, *Spondias mombin* can be unarguably listed among the avalanche non-exploited but fast disappearing group of non-timber forest products considering its vast ethno-botanical

potentials hardly exploited fully nor maximally commercialized. The Non- Timber Forest Products (NTFPs) are plants or plant parts that have a perceived economic or consumption value sufficient to encourage their collection and removal from the forest. It can also be referred to as all the resources or products that may be extracted from forest eco-system and utilized within the household or marketed or possess social, cultural or religious significance (FAO, 1990). Highlighting further the attention given to non-timber forest

products in the last decades, (FAO 1998) revealed that “there has been a growing awareness on the importance of NTFPs especially for food and medicinal uses and this growing awareness is not only for the role they play in the subsistence economy, but also for their potential and real contribution to the economies of many developing countries”. In the contribution of (Shackleton and Shackleton, 2004), “the resources are harvested for both subsistence and commercial use, either regularly or as a fall back during times of need”. Ibe and Madukwe (2011) opined the contribution of non-timber forest products in the reduction of poverty and enhancement of rural livelihood within the limit of the study cannot be overemphasized as they play major role in household economy of not only the poor but also the rich. Relating the above to specific economic perspective, (Schanker et al., 2004), emphasized that “millions of people across the developing world trade in a diverse range of non-timber forest products (NTFPs) everyday, which are marketed primarily in local and regional domestic markets.” In the above regard, *Spondias mombin* cannot be an exception.

Spondias mombin with family name *Anacardiaceae*, is a flowering tropical tree plant native to America. It is a plant found growing mostly in the wild and this may be one of the attributes of its sustainable adaptation to the forest and most scenery. Highlighting the prevalence of the plant and the extensive uses, (Ayoka et al., 2005 and 2008) described it as a “fructiferous tree growing in the rain forest and in the coastal area of Africa. The fruits are edible and sometimes called monkey-plum. The extracted juice is used to prepare ice cream, cool beverages and jelly in Costa Rica and Brazil. The fruits are widely valued as feed for cattle and pigs. The tree exudes a gum that is used as glue. The wood can be used for matchsticks and match boxes, pencils, pen-holders and as a substitute for cork. While the bark is used in dyeing, the fruit juice is drunk as a diuretic and febrifuge”.

Reminiscence in the past was the common trend seeing this plant form part of the ornamental landscape of many compounds/fields. It is a medium-sized deciduous tree cultivated for its yellow, pleasantly acid fruit and as a live fence etc. It produces highly perishable fruit when ripen and very seasonal. This tree provides not only sweet-tasting juice enjoyed by many (mostly children) but just like most other trees, it contributes to environmental protection and enhancement of aesthetic value. It avails man and animal the medium for important exchange of carbon dioxide for oxygen within its environment.

The plant has varying local identity names and uses among the major Nigerian tribes: - Hausa- (*Tsadar masar*); Yoruba- (*Iyeye*); and Igbo- (*Isikala or uvuru*). Describing the tree-plant extensively, (Keay 1989) said “it is widespread in tropical Africa and tropical America and commonly found around towns, villages and farmlands. The tree grows averagely to the height of 18m-20m and about 1.5m - 2m diameter in girth and slightly buttressed. The flowering and eventual fruiting takes place between March-April and July-August”

1.1. Importance and Uses

Spondias mombin uses though vast, cuts across tribes, nations and continents as it provides immeasurable utility in the area of nutrition, shelter/fencing, religion, medicine etc. Buttressing the medicinal potential, (Irvine 1961, Daniel 1990) concludes that all parts of the tree are medicinally useful. “The fruits decoction is drunk as a diuretic and febrifuge, the decoction of the bark and the leaves is used as an emetic, anti-diarrhea, dysentery recipe and for hemorrhoids as well as for gonorrhea and leucorrhoea. A tea of the flowers and the leaves is taken to relieve stomach ache and the gum is employed as an expectorant and to expel tapeworm” (USDA, ARS, 2002). Nutrition-wise, (Opeke 1987), affirmed that “the fleshy fruits of this West Indian tree are used in West Africa for food and its leaves for medicinal purposes.” The fruit juice, just as it is always handy during the season, “it is a very good source of vitamin C” (Keshinro, 1985). Notwithstanding known numerous ethno-botanical potentials of *Spondias mombin*, yet, so many are the ethnic uses yet to be confirmed. Uchendu, (2008) pointed out that “the fresh leaves of *Spondias mombin* is widely used by the natives to aid delivery and to expel the placenta in small ruminants (sheep and goats) in some Eastern parts of Nigeria”.

1.2. Problem Statement

Despite the several usefulness of this wonder-plant, its availability all year round like most other tree products is highly censored by productive season. Given credence to this, (Adeolu and Adeyemo 2011), in their assertion about perishable fruits and vegetables revealed that “the challenge of seasonality is a major one that has to be frontally addressed in the trade and this is what breeds glut and wastage at the same time and because of the highly perishable nature of the fruits, the period of glut results in a lot of wastages”. *Spondias mombin* uses cut across several spheres of life but this study focused more attention on the medicinal uses because knowledge of the other possible uses are virtually lacking in this part of Nigeria. Of most commonly known nutrition-wise is the seasonal road-side juice derived from the ripe fruit and mostly enjoyed by passerby and little children.

Considering the numerous potential benefits associated with *Spondias mombin* (established and not yet established), one would expect a thriving business in the products trading thereby bringing to a halt the avalanche of fruits and other parts of the plant wastages during the productive season which invariably would enhance the economic status of the farmers/traders. Rather, it often constitutes environmental pollution and health hazards. This therefore, cannot be ruled out as one of the reasons why the act of cutting the tree is booming. Some other possible factors are: religious/spiritual misconception, inefficiency in the utilization methods, conservative mentality and grave ignorance of the ethno-botanical/economic potentials of the plant.

It is against the above background – ignorance of the ethno-botanical potentials that this study is carried out while

considering the following research questions: What are the potential uses of *Spondias mombin*? What are the marketing channels involved? Is marketing the products profitable?

2. Research Objective

The general objective involves the assessment of the uses, distribution and marketing with the following specific objectives to:

- 1) identify the marketing channels of distribution in the study area;
- 2) highlight the various potential uses/values in the study area;
- 3) identify factors militating against the marketing;
- 4) analyse the sales profitability.

In justifying this study, the hope and expectation revolve round the fact that missing knowledge gap as regards economic importance and ethno-botanical potentials of *Spondias mombin* will be filled. Though, several were the studies carried out on *Spondias mombin* by Ayoka *et al*, and several others the world over virtually on the medicinal uses, yet, scarcely known are relevant works as regards its economic importance in the marketing sphere. It is therefore expected that this will go a long way in ameliorating many health problems and creating economic power for many (mostly the rural dwellers where abundance of this plant and poverty co-inhabit often). The revealed knowledge would also help in diverse ways in discouraging many people from cutting eco-friendly trees arbitrarily thereby aiding incidence of climate change vagaries. According to (Jhingan 1997), “there is little reason to expect natural resource development if people are indifferent to the products or services which such resource can contribute” This, could among many other reasons be the product of ignorance.

3. Methodology

3.1. Study Area

The study area is Ibadan Metropolis, the capital city of Oyo State. Ibadan is located approximately on longitude $3^{\circ} 51'$ east of the Greenwich meridian and latitude $7^{\circ} 23'$ north of the equator with a distance of about 128Km north-east of Lagos. Ibadan is made up of 11 local government areas among which five are urban and six are semi-urban (NPC 2006). It has a total land area of 3,080Km² and a population of 1,338,659 people (NPC, 2006) estimation. The city, though predominantly populated by the Yoruba, like any cosmopolitan city has several other tribes like Hausa, Igbo, Edo etc and foreigners. While the semi-urban or rural area dwellers are predominantly farmers occupation-wise, the urban or city dwellers are civil servants, traders, artisans, security officers etc. It is a rain forest zone with a bimodal rainfall peak periods.

3.2. Data Collection and Analysis

The study focused attention on the traders involved in the

sales of *Spondias mombin* products in Ibadan using two-stage sampling techniques (purposive and random) for the selection of respondents. Seventy-two (72) questionnaires were administered and collated out of which Sixty-eight (68) were considered for analysis. The four were rejected due to inconsistencies and faulty responses. Purposive sampling method was used in selecting the sampled markets considering the pre-survey knowledge that sales and trading in *Spondias mombin* products is not evenly spread within Ibadan markets. Nine markets were chosen in the 11 local governments in the study area based on the knowledge of the presence *Spondias mombin* traders in the markets. The markets are: Oja-Oba, Ojoo, Oje, Bode, Oranyan, Bodija, Sango, Adelabu and Oritamerin. The primary data were captured through oral interview with structured questionnaires administered randomly to the respondents in the markets (traders involved in *Spondias mombin* business).

Data analysis were done using descriptive statistics like pie chart, histogram and tables to describe and summarize the respondents socio-economic characteristics and distribution channels while budgetary technique and return on investment (ROI) measure were used to derive the gross margin and profitability of the marketing services.

4. Results and Discussions

Table 1. Socio-economic Characteristics Distribution of Respondents

Variable	Frequency	Percentage (%)
Gender		
Male	03	04.41
Female	65	95.59
Age		
≤ 20 yrs	00	00
21-30 yrs	00	00
31-40yrs	12	17.64
41-50 yrs	44	64.71
≥ 51 yrs	12	17.64
Marital Status		
Single	00	00
Married	60	88.24
Separated	05	07.35
Widowed	03	04.41
Religion		
Islam	63	92.65
Christianity	03	04.41
Traditional	02	02.94
Tribes		
Yoruba	68	100
Igbo	00	00
Hausa	00	00
Others	00	00
Educational Qualification		
None	18	26.47
Primary	25	36.76
Secondary	23	33.82
Tertiary	02	02.94

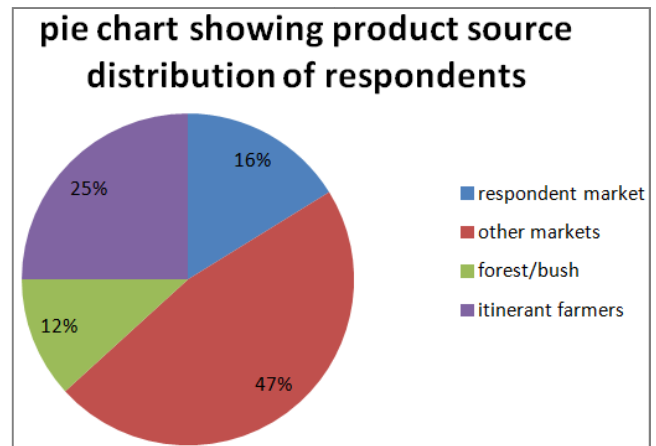
Source: field survey 2014.

The cross-sectional data above revealed that female gender represents overwhelming majority of the traders as 95.5% of the respondents were women and the modal age ranged

between 41 and 50 years. The vast age may be due to the long period of apprenticeship which consumes much of the youthful age. In some cases, some end up in the business as a last resort after losing out in their previous economic engagements. Majority of the traders were married and practice Islamic religion. The entire respondents are Yoruba with level of education crossing between none, primary and secondary. Majority of the secondary school ones dropped out in the lower classes. *Spondias mombin* trading is done in mixture of several other herbal products and most of the patrons are the traditional healers and local herbalists.

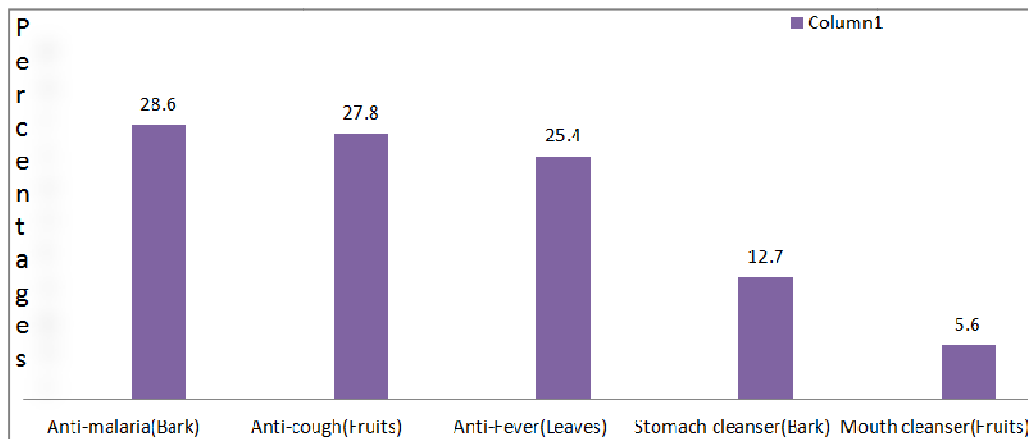
The chart above clearly shows that majority of the traders source their wares from other markets other than their sedentary posts. Though, some of the traders do travel far and near in search of the products in some forests and villages, Bode and Oje markets stand out as the wholesales depot for other markets in Ibadan. The itinerant farmers play contributory role in the distribution channel with about 25% of the products sources into the city reaching the traders

through them.



Source: Field survey 2014

Figure 1. Pie chart showing Product source distribution of respondents



Source: Field survey, 2014

Figure 2. Showing distribution of respondents by medicinal uses. (Multiple response)

The medicinal uses as reflected by the graph above depict a close uniformity and overlap with exception of the mouth cleanser. This is a further proof of the versatility and acceptance of the related parts of the plant as potent ingredients in many curative purposes. It is very much believed among the respondents that *Spondias mombin* leaves in a mixture with some other native ingredients produces a concoction that aids intuitive/clairvoyance ability (not scientifically proved). The figure above shows that the plant is recognized more for the treatment of malaria, cough and fever using the bark, fruits and leaves respectively.

4.1. Budgetary Analysis

Revenue/Cost:

$$\text{Total Revenue (TR)} = \text{Total Sales (₦)}$$

$$\text{Total Variable Cost} = \text{Total cost of products sold} + \text{Transport cost (when involved).} \quad (1)$$

$$\text{Gross Margin} = \text{GM} = \text{TR} - \text{TVC} = \text{Profit.} \quad (2)$$

Return on Investment using the gross margin.

$$\text{Return On Investment (ROI)} = \frac{\text{Gross Margin}}{\text{Total Cost}} \times \frac{100}{1} \quad (3)$$

Quantitative measurement was employed to capture the sales unit. 5kg represent a unit of the products

Table 2. Return/Costs Estimate

Item	Av unit sold /mth	Price / unit (₦)	Revenue (₦)	Cost/unit (₦)	AVC (₦)
Leaves	1.5	3,500	5,250	1,400	2,100
Fruits (dried)	1.19	1,000	1,190	500	595
Bark	3.00	1,000	3,000	500	1,500
Transportation					161.94
Total	5.69		9,440		4,356.94

Source: Field survey, 2014

$$\text{Profit} = \text{Gross Margin} = \text{₦9,440} - \text{₦4,356.94} = \text{₦5,083.06 per month}$$

Mean TVC/month = ₦4,356.94

Mean TR/month = ₦9440

GM/month = ₦9440 - ₦4356.94 = ₦5,083.06

Return On Investment (ROI) = $\frac{\text{Gross Margin}}{\text{Total Cost}} \times \frac{100}{1}$

= $\frac{5083.06}{4356.94} \times \frac{100}{1} = 116.6\%$ or 1.17

The above results reveal in clear terms that trading in *Spondias mombin* products/parts is profitable with the gross margin of ₦5083.06 per month. This is the case in view of the fact that *Spondias mombin* like most non-timber forest products trading does not involve the use of expensive and high technology fixed cost items. The return on investment is 116.6% and this depicts that there is positive net return (profit) of approximately ₦1.17 for every one naira (₦1) invested in the trade.

Limitations/Constraints to effective marketing of *Spondias mombin* expressed by the respondents in the study area:

Table 3. Distribution of respondents by constraints (multiple response).

Constraints	Freq.	Percentage (%)
Fast and gradual reduction of plant accessibility	30	18.30
Effect of seasonality on fresh fruits availability	64	39.00
Lack of enough knowledge of the uses by the society	42	25.60
Poor market structure	28	17.10

Source: Field survey, 2014

Table three above shows clearly that there were four distinctive constraints highlighted by the respondents which were however the product of multiple responses. The most favoured overlap was the effect of seasonality on fresh fruits availability with 39% responses. This is no doubt justified by the ever prevalence of the ripe fruits during the fruiting season. It does not only glut the ever insignificant market demand for the ripe fresh fruit but constitute environmental problem. This was followed by lack of enough knowledge (25.60%) about the uses which in reality determines the acceptability and utilization of resources. Fast and gradual reduction of the plant availability can be well understood as one of the negative correlations of urbanization and rapid deforestation. The poor market structure was the outcome of non uniformity of standard and price due to lack of authentic regulatory body in the marketing.

5. Conclusion/Recommendation

Spondias mombin marketing is predominantly traditional herbal concern. That is, the trading virtually thrives on the need to provide alternative means to healthy living through the local/unorthodox pharmacognosy. It is female-gender driven amidst some constraints. Despite the medicinal uses highlighted in many literatures well affirmed by this study, it

also revealed that marketing in *Spondias mombin* is profitable with gross margin equal to ₦5083.06 and 116.6% return to investment.

This study has limited itself to the marketing aspect of the plant with regard to the parts known to the respondents for their potential usefulness but not averse to further study on the economics of plantation farming of the tree-crop which will no doubt go a long way in reversing some of the negative factors enumerated above. In this regard, there is need for further work on the ethno-botanical potentials of the plant in order to expose to the populace and industries the various uses of the plant not fully exploited. Processing industrial plants should be encouraged or motivated to invest in the preservation and conversion of edible but highly perishable seasonal plants products to concentrates thereby adding value and shelf-life elongation. This will invariably, forestall glut, wastages and environmental hazard. Pharmaceutical and other relevant industries should be encouraged to look inward with regard to sourcing their raw materials locally thereby forcing them to go into planting of the necessary trees or supporting farmers to do so. This enhances income generation in view of the profitability. More efforts should also be channeled into synergy of knowledge between the orthodox pharmacists and local practitioners by highlighting the roles played by local pharmacists in the health sector in the positive way.

Above all, there should be an enabling law by the government with 'iron teeth' to back up the enforcement of the common slogan 'cut one tree, plant two in replacements'. Indiscriminate cutting of trees must just stop if the environment must be sustained for healthy habitation for all.

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