

Edible Indigenous Fruits Business, Household Income and Livelihoods of People of Songea District, Tanzania

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Abstract – Indigenous fruits have been consumed by the rural majority of communities of Africa since time immemorial. Studies indicate that in the continent most of the indigenous fruits are found in the Miombo woodlands, a vegetation cover that extends to vast areas of Southern Africa including Malawi, Zambia, Zimbabwe, Mozambique and Tanzania. Within Tanzania, vegetation of Songea district is typical of Miombo woodlands. Indigenous fruits are said to be the source of nutrition for people living in both rural and urban areas. Existence of a variety of indigenous fruits and their availability only in rural areas necessitates small scale business between rural, which are the sources of indigenous fruits and urban centres which are markets of the same products. The nature and character of indigenous fruits business in Songea district is not clearly explained. Information on the priority types of fruits in the business, reasons for their being prioritized and the contribution of indigenous fruits business to household income remains largely unknown. Qualitative analysis was employed using in-depth interviews (IDIs), supported by Key Informant Interviews (KIIs) to obtain detailed information from the participants. The paper observes that despite existence of several indigenous fruit types, there were three priority types which featured prominently in the market, meaning *Uapaca kirkiana* (masuku), *Strychnos cocculoides* (mtonga) and *Parinari curatelifolia* (mbula) traded in the area. The three are hereby presented in the order of preference basing on their shelf life, customer preference on the taste and their easy availability. Furthermore, the paper observes a unique feature of indigenous fruits markets which poses a challenge to the business. This involves securing a customer with triple coincidence that is the one who stays in urban sector, knows the fruit and at the same time would like to buy it. Certainly one has to have some cash at hand to purchase the fruits. The first condition is limited by products un-knowability an aspect which limits the market size at local and international levels. Indigenous fruits business was found to contribute for about 14% to annual household income of Songea district. This is a significant contribution. Other benefits of rural livelihood include enhancing nutrition status and food security.

Key Words – Indigenous Fruits, Business, Household Income, Livelihoods, Songea.

I. INTRODUCTION

Indigenous fruit trees characterize vast areas of Miombo woodlands of western and southern Tanzania creating livelihoods for millions of people in both rural and urban areas [1][2]. A broad range of edible indigenous fruits has been described by various literatures [1] [3]. Rye-smith [4] observes existence of 3000 indigenous fruit species in Africa, representing the much un-tapped natural resource. Such fruits have been classified as being an important for

provision of diet and income [5] [6]. Indigenous fruits are, as well, said to reduce dangers of both hunger and malnutrition [7] [8] [9]. Despite long time existence of trade in food resources, their marketing channels are not yet known and that for the most part these resources have been neglected in favour of cash crops [10].

Review of literature has indicated that despite vast value tied to indigenous fruits the benefits accrued to the activity of collecting, processing, and selling lack detailed explanation with regard to southern Tanzania, Songea district inclusive. The value chain of indigenous fruits business is not well explained, as much is not known about the how actors, at the village level, perceive the benefits of nature and how they take the opportunities to gain from it. Their engagement in indigenous fruits sector, applied methods in the related activities, challenges they face and benefit obtained out of the sector from the perception of the rural dwellers or practitioners is largely missing. The underpinning theory in this paper is that of “let the voices of the concerned people be heard”.

This paper, therefore, does analyze and present the benefits of indigenous fruits accruing to the rural and immediate urban dealers, meaning those people in town who receive indigenous fruits and sell them to the retailers and direct consumers. This entails the generation of basic information for development of effective value chain indigenous fruits as it applies for the case of Songea district.

A few studies that have been conducted in Tanzania, on indigenous fruits mostly covered Tabora region, and results generalized for the entire country [11] [12] [13]. The author stands to argue that more location specific studies that apply different methods need to be conducted for more pragmatic findings. Indigenous fruits are scattered in other areas of Tanzania with different socio-economic, cultural and geographical conditions.

II. LITERATURE REVIEW

About Miombo Woodlands

Miombo woodlands constitute a significant proportion of forested land in Tanzania concentrated mainly in western and southern parts of the country and are central to livelihoods of millions of rural and urban people and covers an area of 44.6 million ha[1]. The area receives variable rainfall which creates periodic food shortage in which indigenous foods and fruits and other natural products sold and exchanged for food important for survival [14].

According to Temu and Chihongo [15], 83 edible indigenous fruit species have been identified in Miombo woodlands. However, these resources have been declining rapidly due to high rate of deforestation as a result of increasing human pressure. As to what are the causes of deforestation, several studies such as Hyde and sieve [16], Akinnifesi and others [17], Abdallah & Monela [1] and Haule [18] have attributed it to expanded human activities.

Indigenous Fruits in Miombo Woodlands

Rural communities recognize and consume a variety of edible fruits normally gathered and eaten within the locality, while some are sold in the local markets [19]. Most of these fruits are available in dry seasons when there is food shortage and make a significant contribution to the diet and income of the rural communities [1] [8]. However, the situation in Songea was different from the above assertion, whereby indigenous fruits were available in dry seasons when fresh foods were scarce or non-existent [2]. Observation in Songea indicated that food shortage is normally experienced during wet season, whereby crops are yet to dry and be harvested. Moreover, the actual contribution of indigenous fruits business for the respective households is not ascertained. The National Research Council observed indigenous fruits being neglected by research hence be treating them as “marginal foods” which lack significance in the society, a state of affairs which needs re-dress [2].

A study on indigenous fruits conducted by the World Agroforestry Centre in collaboration with CPWild Research Alliance in Tanzania indicated that at local level the indigenous fruits noted to be marketed widely are Zabibupori or Mtalali (*Vitex mombassae*), furu (*Vitex doniana*), ubuyu (*Adansonia digitata*), mbula (*Parinari curatellifonia*) and mtonga (*Strychnos cocculoides*) [20]. Country priority indigenous fruit species for Tanzania are *Parinari curatellifonia*, *Strychnos cocculoides*, Masuku (*Uapaca kirkiana*), *Vitex mombassae* and *Vitex doniana*. The need to investigate the situation pertinent location-specific priority indigenous fruits for Songea district are crucial since Tanzania covers a wide geographical area characterized by a variety of both physical and natural vegetation likely to differ in terms of biodiversity and socio-cultural factors.

Trade in Edible Indigenous Fruits

Some indigenous fruits are articles of commerce in the local, national and regional markets. Indigenous fruits can therefore mitigate poverty and spur economic growth if properly developed [21]. One wonders as to whether expanded markets will sustain their availability over a long time. A synthesis appraisal carried out in Ethiopia, Kenya, Sudan and Tanzania indicated that East Africa has the potential for development of resources/commodities [21].

The appraisal indicated that fruits were marketed in various segments. However, most fruits have specialized *niche* market at local level though most of them have potential of being traded at national even regional level once markets are developed. How indigenous fruits business is characterized, for the case of Songea district and its contribution to household income form a focus of

this paper. One wonders on as to how has Botswana managed to focus its indigenous fruits market *niche* on tourism industry [22]; why not Tanzania, which has broad range of tourist attractions? Jordaan *et al* [20] observes the need for market segmentation and addressing targeted markets for the case of indigenous fruits business.

Currently, in Africa, Tanzania in particular, there are no developed systems of post-harvest handling of fruits that are traded widely and some of the fruits become perishable when stored for only few days. Improper postharvest handling renders the products inedible leading to loss in the products [1] [23] [3]. Records on some indigenous products could not be noted anywhere [3]. How indigenous fruits of Songea district are treated towards selling is one aspect which this paper strives to establish. The right technology for storage, processing has to be identified and developed so that it corresponds to requirements of the market place and managerial and technical capabilities [20]. Indigenous fruits yield was noted to be unpredictable and unrecorded [2], hence posing a gap in appraising their socio-economic impact.

Depending on the fruit species collected, between 10-58% of the fruit rot is brought home due to high perishability and lack of storage facilities in rural areas [24]. Furthermore, about 15% of respondents, mostly women process indigenous fruits locally to produce juice, beers, wines, jam and cakes in order to increase profitability and increase shelf life of the products. The paper is a step towards unveiling some measures to be taken to address this problem likely to adversely affect profitability of indigenous fruits business.

Economic analysis for Tabora region indicated that juice making contributes to additional USD 13 to farmer income on monthly basis [1]. To promote processing of indigenous fruits into juices, jams or wines, SADC-ICRAF project developed documented standardized house level protocols [1]. Whether the level of profitability found for Tabora is replicated in the context of Songea and the entire country is one of aspects to be tested for verification. Moreover, the contribution of indigenous fruits business to household income and rural livelihood demands for a detailed scientific enquiry.

Mumba and others [24] noted that fruit and processed products are still having poor market due to lack of promotion. Ham attributes this to low standards of indigenous fruit products resulting from inadequate capital to acquire better processing equipment, packaging and market promotion beyond the production area. In this case improvement is needed [25]. This involves introduction of standard product packaging to be certified by Tanzanian Bureau of Standards (TBS) and shell identification, and professionally planned product advertisement through different media. Basing on the above discussion, the need for appraising indigenous fruits processing methods, applicable in Songea District becomes evident. Whether the training on indigenous fruits processing provided to rural women of Tabora region has been able to diffuse and spread to as far as Ruvuma region offers another important area for analysis. If yes; then credit to the diffusionist theory of technology and skills transfer. If no; then it may

be proposed that the same type of training be extended to other areas of Tanzania and elsewhere, located in Miombo woodlands, a natural home of indigenous fruits. This will raise extra income obtained from indigenous fruits business, a resource which is largely untapped.

The study by Chikamai and others[23] on “Review and Appraisal on the Status of Indigenous Fruits in Eastern Africa” recommended that government and donors and NGOs have to support research and development existing technical information on propagation, nutritive values and traits be improved for development activities in parts of the Zambezi region should be promoted other regions for livelihood improvement. One wonder as to whether propagation and planting of indigenous fruits maintains naturalness of the same plants. In case it does; then why not plant the same trees in the forest? To the author of this paper, planting propagated plants in a farm is closer to artificializing the natural vegetation, an aspect which affects the natural environment. To this paper conservation refers to caring of plants in their natural status. Seeds and seedlings are proposed to be left to grow *in situ*.

III. CONCEPTUAL FRAMEWORK AND CONCEPTUAL MODEL

Conceptual Framework

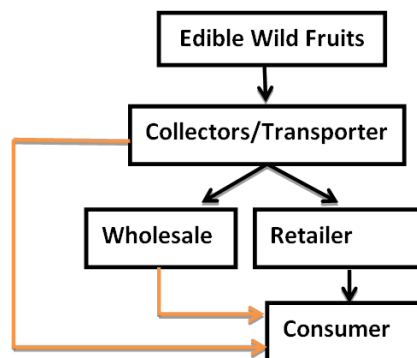
The paper conceptualizes forest resources being the basis for indigenous fruits business, implying that indigenous fruits are products of the forest hence a component part of forest resources. Collectors of indigenous fruits are for the most part the transporters of the same forest products to both villages and neighbouring towns.

Large scale collectors are those collectors who sell their indigenous fruits to a few wholesalers, normally staying in town or from town; and those who sell the products to the retailers, who supply the same to the consumers.

However, there are some collectors and wholesalers who sell the products directly to consumers; a new phenomenon which was not observed by Karaan and others [25]. This is a phenomenon observed in Songea and stipulated by this paper.

Conceptual Model

Figure 1. Supply Chain Combinations as Observed in Songea, Tanzania



Source: Researcher’s own Construct (2015)

IV. METHODOLOGY

The study applied a qualitative approach whereby in-depth interviews (IDIs) were conducted in two localities of Lipaya and Mahilo, covering six respondents interviewed at Lipaya and Matogoro Sunday markets for the localities respectively. Respondents were selected basing on *purposive sampling* so as to obtain maximum variation of respondents and responses.

Key Informant Interviews (KIIs) were conducted in 3 localities, referring to Mpitimbi, Lipaya and Mlete village located at the border with Namtumbo district. Key informants were selected from people who stayed in the locality for more than 50 years and had participated on still participates in the business and knows other people currently involved in the business. Each key informant was considered having past, present and future opinions about indigenous fruits and indigenous fruits business. Interview guides were used for the purpose.

Observation was used for the phenomena that could be seen as one moved around the village setting, it includes availability of indigenous fruits within the vicinity, farm clearing if it involved indigenous fruits, selling of some indigenous fruits, the prices and environment where indigenous fruits were sold etc.

Responses were recorded, transcribed and translated from Kiswahili to English. Data were arranged into identified themes and coded accordingly prior to analyzing.

Both types of interviews were used to collect data on the types of indigenous fruits, methods of obtaining them, sources of indigenous fruits, people who collected the same, reasons for their involvement in collecting, processing and selling. Information collected also included prices at which they sold the fruits, why they sold at that price, who was the buyers, how they used money obtained and gender relations in indigenous fruits business. Findings were generated after grounding the data and information.

V. PRESENTATION AND DISCUSSION OF FINDINGS

(i) Types of Indigenous Fruits

The paper observes the presence of several species of indigenous fruits such as masuku, mbula (*Parinari curatellifolia*), madonga (*Strychnos cocculoides*), mbingimbingi (*Ximenia caffra*), furu (*Vitex doniana*), maviro (*Maltidentia crassa*), makowozi (*Syzygium guineense*) and zabibupori or ndavatava (*Vitex mombassae*) in the district. These fruits are consumed at household level within respective seasons of availability. They were not stored for the periods when they are not available. It was observed further that the most commonly traded fruits were *Uapaca kirkiana*, *Strychnos cocculoides* and *Parinari curatellifolia*; arranged in the order of priority.

(ii) Quantities of Indigenous Fruits

Despite the persistent existence of indigenous fruit trees, availability of such fruits differed in terms of seasons and

annual harvests. Through time, indigenous fruits were mentioned to be available although the production levels tended to differ due to unspecified reasons. In some localities, especially those areas with expansion of villages due to population increase, indigenous fruits tended to decrease in availability. It was observed that more and more indigenous fruits trees tend to be slashed while clearing farms for farming. This is the essence of deforestation. Among the responses directly quoted from the respondent was:

“As indigenous fruits grow in the wilderness; nobody is tasked to care for the trees. Some people do slash the indigenous fruits trees, therefore limiting indigenous fruits availability. We do leave some indigenous fruits trees in our farms but when it comes to harvesting, anybody may pick or collect fruits even before the owner does so. This discourages the entire exercise of keeping such trees.”

Variations on indigenous fruits production levels and supplies in the forest were recorded being partly a result of nature of plants whereby in some years they bear fewer fruits than in others. No specific description was given on this plant's biological behaviour. The variations in fruits productivity were highly unpredictable.

(iii) Indigenous Fruits Business

At the village level, there was no one who sold indigenous fruits to another. This is because indigenous fruits were considered a ubiquity and a gift of nature. No one would like or agree to buy such fruits at village level. They were meant to be enjoyed for free.

Indigenous fruit collectors, normally women aged between 15 and 45 collected fruits and filled in containers, normally baskets to be transported back home. The only processing procedure done was to wash fruits in water and dry them on the sun for few minutes, say for ten minutes. In the following day, same fruits had to be transported to Songea municipality for sale. Some of the fruits were bought by middlemen to the peri-urban section while others were sold to direct consumers in town centre. This was observed being done through hawking or at arranged selected selling points whereby potential and actual customers were all people passing along the road.

The respondents indicated that it was profitable for small scale business men and women to sell indigenous fruits along with other products, normally vegetables. This strategy reduced labour burden as various types of products were transported and sold at the same time by the very person. The hawkers of Songea advertise their products by singing songs whereby products carried in the basket were mentioned one by one.

Such songs contained words as follows:

“Mchicha, mchicha, matunda-pori na bamiiiaa!!”

Its literal translation is:

“Spinach, spinach, wild fruits and okraaa!!”

It implies that the very hawker was selling three types of products which include two types of vegetables and unspecified indigenous fruits.

(iv) Pricing of Indigenous Fruits

Those who sell indigenous fruits to middlemen, do so at a price. In the year 2015, the average price for a 10 litre container of *Uapaca kirkiana* was sold at average price of

Tshs 3225 equivalent to USD 1.5 During the period of scarcity of indigenous fruits, at the beginning and at the end of the production season, the average minimum price was Tshs 3,700; while the maximum price was Tshs 5000. During high season, the average price was Tshs 2,750. *Strychnos cocculoides* (Madonga) were sold each at the average price of Tshs 100 per piece and maximum unit price of Tshs 200 during low seasons; while during high seasons one fruit cost only about Tshs 50.

It is noted that prices of indigenous fruits were fixed by types of fruits influenced by their shelf life and their taste. Those fruits which take long time to rot they are more preferred for sell than others. When asked on how business women and men fixed prices of their products (indigenous fruits), one of the responses was:

“We for the most part just consider labour we deploy for walking to the forest and back as well as some transportation costs involved. At the market, we get influenced by the way our customers respond to our prices. In fact, there is room for price negotiations. Of course different types of fruits have different initial price tag”.

(iv) The income Obtained

The income obtained by individuals dealing with indigenous fruits selling differed in terms of quantities of fruits they supplied. However, it was made known through in-depth discussions that on average the lowest level of income one may obtain in one season of the year is Tshs 20,000 while the estimated maximum amount is Tshs 180,000, making the annual average income accrued from indigenous fruits selling of Tshs 100,000.

At Matogoro Sunday market, most of the sellers were the very ones who actually collected the indigenous fruits from forests located near villages of Mahilo, Mpingi and Kikunja. This diverts from the chain stipulated by Karaan and others [25]. In this case collectors sell directly to consumers. The fruits were counted and/or arranged in heaps then directly sold to consumers. This may be inferred to absence of processing, which would necessitate existence of some dominant wholesaler component who could deal with bulk products.

Taking the case, we consider two sellers of *Uapaca kirkiana*, named A and B, interpreting in the context of the study area; the following tenets and conclusion would be deduced. During high season, for seller A, a heap of 8 units was sold at Tshs 200. While during low season a heap of 4 units was sold at Tshs 200. Seller B reported selling 6 units of masuku at Tshs 100 during high season; and 6 pcs at a maximum of Tshs 200 during low season.

The above two cases, which represent the real indigenous fruits pricing situation in Songea district, signify that during the low season masuku price doubles; an aspect which translates to doubling profit as transport cost, that is bicycle haulage, remains zero. Sellers of indigenous fruits indicated using alternative approaches to setting prices; but ensuring that profitability is guaranteed. The two techniques ensured that a range of customers, with less money and those with relatively more money are accommodated, meaning that they may afford the price.

The sampled direct response obtained from the respondent was:

“The additional income is only reflected to those households which deal with indigenous fruits business. In fact, only a smaller number of us do this kind of business since it is laborious and renders into little income. Majority of households have their children collecting indigenous fruits only for their own consumption”.

When compared to the average household income in Songea district, which is about Tshs 599;794 [26], average income obtained from a single indigenous fruits collector stands at Tshs 83,000 about US \$ 42 which accounts for 14% of average annual household income. This constitutes a substantial contribution to household income, as one household might have more than one indigenous fruits collector, therefore augmenting the contribution.

(v) *Utilization of Income obtained through Indigenous Fruits Selling*

There are several items that were mentioned to be bought by the sellers of indigenous fruits using money obtained through indigenous fruits selling. Generally speaking, they used the income for purchasing “small items” used individually and at household level. Such items include soap, sugar, matches, kerosene, meat and the like.

The sample response given direct explanation that:

“The amount we gain from indigenous fruits business is very little as the fruits fetch lower price in the market. But the money is significant when it comes to supporting our livelihoods. Through it we buy some basic provisions like soap, kerosene, salt, sugar”

Though such items are labeled as “small” it may be noted that they are of great significance in ensuring human health, hygiene and nutrition. Value of such items may be properly accorded in case a household misses them. It is worth emphasizing that the contribution of indigenous fruits business is appreciably high as it surpasses by far the economic value.

VI. CONCLUSIONS

There is a broad range of edible indigenous fruits found in Songea though only a few have been accorded market value. These include masuku, madonga and mbula. In the study area, there was literally no indigenous fruits processing observed despite existence of a broad range of indigenous fruits. Only a few people were mentioned to produce local juice out of *Strychnos cocculoides*. Other products such as jam and wine were not being produced at all. This was mainly attributed to lack of knowledge and skills on how to make the same. The “diffusionist theory” of technology which was assumed extend from Tabora (where people were trained on indigenous fruits processing to other part of Tanzania (including Songea district, more than 1000 kilometres away) could not work as expected as it failed to bring an impact to the destination area.

The quantities of indigenous fruits tend to fall with time due to deforestation which is attributed to population growth. In areas where indigenous fruits are still found in

large numbers, fluctuations in quantity and sometimes quality of fruits are experienced attributed to natural conditions. In some years, plants bear fewer fruits for reasons not clearly known; hence demanding for separate scientific study.

Rices of indigenous fruits are fixed basing on availability, influenced by product’s shelf life and taste; dictated by parts of the season, referring to “scarcity” or “plenty”. Both “start of the season” and the “end of the season” signifies less supply or scarcity of wild fruits, hence higher prices; while in the middle of the season the supply is higher (plenty), thus lower prices. It implies that the law of demand and supply applies in this context.

The income accrued from indigenous fruit selling was significant proportion household income. It accounted for about 14% of the total average annual household income for the district. The contribution of indigenous fruits business to household income is very significant as it involves physical or financial literally to capital outlay. The same income accrued from indigenous fruit sales was significant and used for purchasing of essential items for the household. As this income is mainly contributed by women, appreciation of women’s role in households’ livelihood needs not being emphasized.

VII. RECOMMENDATIONS

The paper proposes that the three priority fruits, which are *Uapaca kirkiana*, *Strychnos cocculoides*, and *Parinari curatelifolia*, continue to be sold in the market while promoting those less common but classified by literature as useful.

Knowledge and skills on indigenous fruits utilization, processing, domestication, and conservation should be extended to different regions where indigenous fruits are found in plenty, Songea district inclusive. This may add production levels of indigenous fruits thus ascertain their availability. Processing will add value to the products hence availing more income to the local population. It is further proposed that “diffusionist theory” of technology work at district level other than at national level whereby due to the large size of the country it has failed to work.

Conservation initiatives be introduced and promoted so as to address the observed declining pattern of indigenous fruits with time. The paper sees the need to domesticate some indigenous fruits in farms and around homesteads will ensure sustainable availability of indigenous fruits. Forest conservation will, in the long run, automatically conserve indigenous fruits.

Value addition is necessary so as to raise “profit” obtained in the business since, devoid of processing; Indigenous fruits are sold at a cheaper price. It is proposed that farmers be trained and facilitated on processing of indigenous fruits for promotion of their business. One may ask a basic question if farmers of Tabora-Tanzania were trained on indigenous fruits promotion, why not those of Songea and elsewhere?

It is proposed that pricing mechanisms be reviewed and markets be expanded through promotion of indigenous

fruits so that the products fetch higher value like *Aloe Vera*.

The income accrued from indigenous from indigenous fruits selling has to be used in the manner that benefits all household and individual actors in the sector. Women and children be a focus of expenditure. Gender dimension of the indigenous fruits sector is an area calling for a specific enquiry.

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