

**VALUE CHAIN ANALYSIS OF BAOBAB PRODUCTS FOR
IMPROVED MARKETING AND SUSTAINABILITY OF THEIR
TRADE IN MALAWI**

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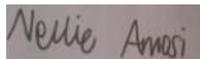
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Parts of this work have been presented at 2017 National Research Dissemination Conference in Mangochi and RUFORUM Biennial Conference in Cape Town (2016) as: Actors of baobab trade and their shares along the value chain and Actors of baobab trade and their linkages along the value chain respectively.

A manuscript for publication in a peer review journal has been developed as seen as relationships of baobab actors and their value shares in Malawi.

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DEDICATION

To Gladys Lexa Amosi, my Mother

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ABSTRACT

There is very little information on the basic market functioning and actors involved in baobab product trade of baobab products which has predominantly remained informal with limited commercialization. A study was carried out to analyse the value chain of baobab products for improved marketing and sustainability of the trade in Malawi. The objectives were: to assess actors involved in baobab trade along the value chain and map out their relationships; to analyse the benefits earned by economic actors from baobab trade along the value chain and to assess the institutional arrangements and institutions that govern baobab trade at international, national, district, and local levels. Purposive sampling was used to select the districts while snow balling technique was used in selecting the actors of baobab trade. Mapping was carried out to assess actors involved in the baobab trade and map their relationships. Gross margin analysis was done to evaluate the benefits earned by economic actors from baobab trade along the value chain. Content and narrative analyses were used in assessing the institutional arrangements and institutions that govern baobab trade. Six categories of actors of baobab trade were identified, namely; harvesters, wholesalers, processors, retailers, consumers, and exporters. Three types of relationships exist between baobab actors in Malawi, namely; *spot market relationship*, *persistent network relationship*, and *horizontal integration relationship*. In terms of gross margins, individual harvesters get 92%; wholesalers selling pulp (80%), Juice Company (61%), household processors (79%), supermarkets (13%) and finally cooperative union exporting baobab products get 80%. International Organization for Standards (ISO), Fair-trade Labeling Organization (FLO), and others are at international level providing environmental, organic standards, certification and setting quality standards. Government of Malawi with its institutions of Vision 2020, Malawi

Growth and Development Strategy (MGDS) II, National Environmental Policy and Forest Policy falls at national level. Cooperative Union promoting market linkages for cooperative groups is at district level while at local level there is baobab association and market committees providing quality raw material and facilitating social welfare respectively. Actors in baobab trade in Malawi need to get involved in horizontal integration relationship because not only does it increase market power, market share, and economies of scale, but also it reduces production costs as well as competition. Since Malawi is the key producer of baobab pulp in the Southern region of Africa, there is need for the Government of Malawi and other institutions to domesticate programs of baobab to sustain production of improved products which attracts higher prices in local chain stores and on international markets.

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LIST OF ACRONYMS

EU	European Union
FAO	Food Agriculture Organization
FGD	Focus Group Discussion
FLO	Fair-trade Labeling Organization
GACP	Good Agriculture and Collecting Practice
GDP	Gross Domestic Product
GMP	Good Manufacturing Practice
GoM	Government of Malawi
HACCP	Hazard Analysis Critical Control Point
ICRAF	International Centre for Research in Agroforestry
ICUC	International Centre for Underutilized Crops
IFTA	International Fair-trade Association
ISO	International Organization for Standardization
Kg	Kilogram
L	Litre
mm	Millimeter
m	Meter
MBS	Malawi Bureau of Standards
MGDS	Malawi Growth Development Strategy
MITC	Malawi Investment and Trade Centre
MK	Malawi Kwacha
MRA	Malawi Revenue Authority
NGO	Non-Governmental Organization

NTFP	Non Timber Forest Product
OVOP	One Village One Product
PQS	Pre Qualified Supplier
RTFP	Regional Trade Facilitation Program
RUFORUM	Regional Universities Forum for capacity building in agriculture
SPSS	Statistical Package for Social Sciences
USA	United States of America
UK	United Kingdom
US\$	United States Dollar
WHO	World Health Organization
€	Sterling Pound
°C	Degrees Celsius

CHAPTER ONE

INTRODUCTION

This chapter presents the background of the study describing value chain analysis and its importance. Trade of baobab and climatic characteristics of baobab growth are highlighted and the different parts of the baobab tree that are used are described. Further, this chapter presents the problem statement, research objectives, research questions and research justification.

1.1 Background of the study

Households harvesting fruits and other products from forests and their farms can avoid hunger, boost rural employment and generate income (Mithofer, 2004) through processing and value adding (Saka *et al.*, 2008). As documented by Te Velde *et al.* (2006) primary products of Non Timber Forest Products (NTFPs) are linked to final consumers through so-called value chains. Value chain analysis has emerged on the new research agenda for NTFPs and increasingly it is acknowledged that dependency and links to forests go beyond village boundaries (Jensen, 2009).

At the most basic level Kaplinsky & Morris (2001) described value chain analysis as a methodological tool to plot the flow of goods and services up and down the chain, and between different chains. According to Gibbon & Ponte (2005) the use of the term *value*

chain suggests a focus on relationships between buyers and suppliers, and the movement of goods or services from producer to consumer. The concept of value chain encompasses issues of organization and coordination of different actors (dealing with baobab in this case) in the chain (Humphrey & Schmitz, 2000). Conducting a value chain analysis requires thorough investigation of what is going on between the actors in the chain, what keeps these actors together, what information is shared, and how relationships between actors are evolving (Kaplinsky & Morris, 2001).

One crucial point to note is that promoting commercialization of plant species without clear understanding of their value chains has been reported to result in heavily distorted and biased markets (Agea *et al.*, 2011). Many authors (El-Siddig *et al.*, 2006; Jaenicke, 2010; Sidibe & Williams, 2002) have concluded that there is a total lack of socio-economic research at all levels along the production-to-consumption chain of NTFPs. Similarly, Akinnifesi *et al.* (2006) concluded that although many rural households rely on indigenous trees as sources of cash and subsistence, until recently there has been little effort to cultivate, improve, or add value to these species. This is where now the International Centre for Research in Agroforestry (ICRAF, the World Agroforestry Centre) initiated a worldwide programme to domesticate the species identified by local people as their priority for cultivation in agroforestry systems (Tchoundjeu *et al.*, 2010) and *Adansonia digitata*L. (baobab) was one of them (Akinnifesi *et al.*, 2006).

Baobab is regarded as the highest earner of all NTFPs in the Southern Region of Africa, with projections suggesting annual incomes of up to US\$1 billion for producer countries (Regional Trade Facilitation Program [RTFP], 2007). Baobab trade has the potential to be a

billion-dollar industry for the continent of Africa and could employ over 2.5 million households, if fully commercialized (Vassiliou, 2008). Recently, baobab fruit pulp has been approved for sale in the European Union (EU) (2008/575/EC) and United States of America (USA) (GRAS Notice No. GRN 000273), and has thus entered the formal international food market offering opportunities for income generation for African farmers (EU, 2008). The most important EU importers of baobab fruit powder are Germany, France, and The Netherlands, while the most important exporters of baobab products are France, Germany and the United Kingdom (UK) (Gruenwald & Galizia, 2005). In the EU in 2003, the import value of baobab pulp grew by 13% while the export value grew by 11% (Baigonti, 2004).

Research in Benin has found more than 300 uses for different baobab tree parts (Buchmann *et al.*, 2010). In Senegal, baobab fruit pulp is processed by the Baobab Fruit Company Senegal, a subsidiary of the Italian Baobab Fruit Company (Gruenwald & Galizia, 2005). Sudan, Mali, and Benin are some of the African countries selling and using baobab products at a large scale (De Caluwe, 2011).

In Southern Africa, PhytoTrade Africa lobbied with European countries to allow baobab pulp import as a novel food product (Buchmann *et al.*, 2010; PhytoTrade Africa, 2008). The aim was to increase economic growth in the rural areas of Southern Africa based on the sustainable commercialization of baobab. PhytoTrade Africa procures baobab products, especially pulp, from Southern Africa (Zimbabwe, Mozambique, South Africa, Botswana, Zambia, Namibia, and Malawi) for export to international markets (Akinnifesi *et al.*, 2008; PhytoTrade Africa, 2008).

Several studies done in Africa have highlighted the importance of baobab in generating income for different actors involved in the baobab trade as shown in Table 1.

Table 1: Revenues accrued from baobab by actors in different countries in Africa

Location	Baobab revenue (US\$)	Actor	Author & Year
South Africa	22,250	Processor	Akinnifesi <i>et al.</i> , 2008
Sudan	3,696	Trader	Gumma, 2011
Zimbabwe	380-1,500	Trader	Luckert, 2014
Malawi	2.5-714	Trader	Munthali, 2012

Data source: Secondary data

Malawi is one of the key producers of baobab pulp through TreeCrops Limited, a subsidiary of PhytoTrade Africa (PhytoTrade Africa, 2008). An estimated 80% of Malawians depend on baobab for subsistence and household income (Government of Malawi [GoM], 2011). A study done by Munthali (2012) found that baobab is extremely important for the livelihood of rural Malawians such that both rural and urban communities use most parts of the tree. Baobab fruit pulp is eaten raw or mixed with porridge (Chirwa *et al.*, 2006). Baobab is also processed into juice and ice-lollies and seeds are roasted and eaten (Munthali, 2012; Sanchez, 2011). Fiber from bark is used to make ropes, mats, hats and crafts (Chirwa *et al.*, 2006). Baobab tree is one of the species used by commercial fruit processors in Malawi (Franzel *et al.*, 2008). Munthali (2012) found that revenue accrued per month per person from the sale of baobab products ranged from US\$2.5 to US\$715; while cottage industries made between US\$1100 and US\$2300; with net profits of about US\$595 per person and US\$1535 from the enterprise.

Although baobab is an important commercial product, trade is predominantly informal (Munthali, 2012; Sidibe & Williams, 2002). Akinnifesi *et al.* (2005) highlighted that in general, indigenous fruit commercialization is poorly developed in Malawi. Despite the socio-economic importance of baobab in Malawi, very little information is available on the commercialization of the species (Sanchez, 2011). Munthali (2012) bemoans the poor market mechanisms for baobab actors and calls for government policies to facilitate the marketing to move from informal to formal sector which comes with high prices. This study, therefore, aims at filling the gap identified by the aforementioned authors in the studies they conducted on the marketing of baobab fruit products.

1.2 Problem statement

According to Akinnifesi *et al.* (2005) indigenous fruit (including baobab) markets are marked by a lack of product differentiation, coordination between actors, and consumer knowledge on products. De Caluwe (2011) has recognized that there is very little information available on the basic market functioning and actors involved in the trade of baobab products in general. Additionally, De Caluwe (2011) has identified that, generally there is lack of legislative and regulatory policies in baobab marketing, research and extension. In Malawi, Munthali (2012) and Sanchez (2011) reported that baobab product trade was predominantly an informal trade with limited commercialization. Despite the benefits of commercializing indigenous fruits, commercial processing enterprises and markets are still in their infancy in Malawi (Akinnifesi *et al.*, 2005).

Additionally, in spite of good knowledge in characterization of baobab, there is a dearth of knowledge in baobab marketing in Malawi (Sanchez, 2011). Specifically, there is little information on value chain analysis of the species. The information gap has been created because studies on value chain analysis in Malawi have concentrated mainly on agricultural crops (Rates, 2003) tobacco, maize, rice and cotton (Tchale & Keyser, 2010). While scholars like Njaya & Kachilonda (2008) did a value chain study for *Engraulicypris sardella* (Usipa), and (Phiri *et al.*, 2013) carried a value chain analysis on Lake Malawi fish (*Oreochromis spp*), the same has not been done on baobab. Some of the baobab studies in Malawi have concentrated on phenotypic variation (Munthali *et al.*, 2012), tree characteristics (Sanchez, 2011), genetic differentiation and diversity (Munthali *et al.*, 2013), domestication (Akinnifesi *et al.*, 2008), and nutritional (Saka *et al.*, 2008). De Caluwe (2011) indicated that to be successful, domestication of baobab products has to be linked to commercialization and market expansion. This indicates the need for research on the commercialization of the species.

The consequence of this information gap of baobab has resulted in lack of structured marketing and hence making the trade of baobab to be informal. This, therefore, has increased the inefficiency and ineffectiveness of actors involved in the trade of baobab by contributing to decrease in total generated value and incompetence of involved actors to increase their share (Neumann & Hirsch, 2000). Informal trade is usually perceived as a problem because it takes place outside the reach of state law that offer clear and well-known rights to people and, therefore, the market is not transparent (Perez & Byron, 1999). The lack of rules and regulations puts excessive pressure on the resources (baobab trees in this case) besides limiting sharing of market information (KIT & IIRR, 2008). Furthermore, informal

trade creates a vicious circle characterized by a lack of business organization, limited access to formal finance, unreliable labeling and quality standards (KIT & IIRR, 2008). Actors in informal markets are not organized and lack bargaining power when selling their products and, hence, offer low value added products that attract low prices (Welford & Breton, 2008). As a result, according to KIT & IIRR (2008), informal economy can be seen as a basis of the future growth of poor African economies. It was, therefore, necessary to undertake this study to address the problems elucidated above.

1.3 Research objectives

1.3.1 Overall objective

To analyse value chain of baobab products in Malawi so as to improve the marketing and sustainability of the trade for improved livelihoods

1.3.2 Specific objectives

- To identify the actors involved in baobab trade along the value chain and map out their relationships.
- To calculate the benefits earned by economic actors from baobab trade along the value chain.
- To identify the institutional arrangements and institutions that govern baobab trade at international, national, district, and local levels.

1.3.3 Research questions

- What is the relationship between main actors of baobab trade in Malawi?
- How are benefits from baobab management and utilization distributed along the value chain?
- Are there any institutional arrangements and institutions that govern baobab trade at international, national, district, and local levels?

1.4 Research justification

Baobab is regarded as the highest earner of all NTFPs in the Southern Region of Africa, with projections suggesting annual incomes of up to US\$ 1 billion for producer countries (RTFP,

2007). The study on value chain on baobab products for improved marketing and sustainability of their trade in Malawi is important in addressing gaps identified in policy, practice and knowledge. Literature has shown that there is lack of legislative and regulatory policies in baobab marketing research (De Caluwe, 2011). Where they are present, local by-laws are not enforced in Malawi. The consequences of unregulated harvesting are low quality products attracting low prices, tree damage and unsustainable trade.

In terms of practice, quality of baobab products is compromised by poor storage practices (Chadare, 2010). Understanding baobab trade along its value chain might bring awareness of how actors at each stage of the chain could maximize gains from the trade through regulated market structures and proper handling of the product.

There appears to be a slow migration by actors to formal trade in baobab. There is thus a window of opportunities to add value to available information on baobab trade in Malawi and strengthen institutions to make baobab trade more viable and more beneficial to actors involved. This study only attempts to identify the actors, map their relationships, analyze how benefits are shared and assess institutional arrangements currently driving the trade.

After identifying actors in the trade and mapping their relationships, the study could identify beneficial relationships between actors in the trade, establish ways to maximize profits and minimize losses and hence leveraging the trade. This study will help the actors in baobab trade to be innovative in the product differentiation, capitalize on formal markets where they can sell their products at a higher price to earn higher revenues. The research could also reveal the many baobab products produced by different processors and attempt to address the

problem of food neophobia. With the knowledge generated in this study, consumers of baobab products would be exposed to a variety of baobab products with nutritional as well as health benefits.

Characterization of baobab in Malawi has been well studied (Munthali *et al.*, 2013; Munthali, 2012; Sanchez, 2011; Akinnifesi *et al.*, 2008). However, studies of baobab trade still remain a relatively less explored turf. Studies on value chain analysis in Malawi have concentrated mainly on agricultural crops and fisheries (Phiri *et al.*, 2013; Tchale & Keyser, 2010; Njaya & Kachilonda, 2008; Rates, 2003). This study is the first to pioneer value chain analysis on baobab products in Malawi.

Besides benefitting actors involved in the trade, the study will benefit policy makers as well. Recommendations could help direct government resources towards regulating conservation, protection and utilization of the baobab tree and its products. Academicians can piggyback on the findings to identify further areas of research and improve marketing and sustainability of baobab trade in Malawi.

The findings will help to identify actors in the baobab trade, their relationships, share of benefits from the trade and define institutions that would help to maximize benefits to society accruing from the baobab trade in Malawi.

CHAPTER TWO

LITERATURE REVIEW

This chapter starts by providing literature on theoretical background, conceptual framework, value chain mapping, capturing values along the chain, institutional arrangements and institutions of baobab trade, and finally empirical evidence.

2.1 Theoretical background

According to De Caluwe (2011) the value chain concept has evolved through time across various disciplinary fields, areas of application, and levels of analytical aggregation. Four main research streams are distinguished: (i) the *filière* approach; (ii) the sub-sector in 1970's (iii) the conceptual framework elaborated by Porter (1980); and (iv) the global approach. Around 1960's a *filière* approach (*filière* means thread or chain) was developed by a number of French Researchers encompassing a static model with non-changing actors and national boundaries, describing the linear flow of physical inputs and services in the production of a final product. Initially, the approach was used as a tool to analyze the ways in which agricultural production systems were organized in developing countries under the French colonial system. The *filière* framework paid special attention to how local production systems were linked to processing industry, trade, export, and final consumer. The main idea was to highlight and map out specific physical commodity flows within a sector, including

key stakeholders, though usually confining the analysis to domestic markets and ignoring dynamic adjustments to sector characteristics and relationships.

However, *filière* analysis tended to be viewed as having a static character, reflecting relations at a certain point in time. Roduner (2004) argued that the *filière* did not indicate the growing or shrinking flows, either of commodity or knowledge, nor the rise and fall of actors. The general *filière* concept has been applied to the domestic value chains stopping at national boundaries (Kaplinsky & Morris, 2001).

The concept of the sub-sector followed the *filière* concept and was first introduced by Shaffer (1970) which was also an important conceptual development related to value chains. A sub-sector encompasses an interdependent array of organizations, resources, laws, and institutions involved in producing, processing, and distributing an agricultural commodity. According to Shaffer (1970), the concept was developed not only as a process of getting to understand different stages in the value addition but also looks at what technologies are used and at what terms and with whose help. Sub-sector analysis encompasses a meaningful grouping of economic activities linked horizontally and vertically by market relationships. It looks at the networks of relationships linking suppliers, processors, transporters, and traders in ways that connect producers and enterprises with final consumers of goods and services. Sub-sector analysis tends to be static and suffers from the weakness of its own bounded parameters (Kaplinsky & Morris, 2001).

The term value chain was first used by Porter (1980). Porter (1980) developed the value chain analysis as an instrument for identifying the value of each step in the production

process in 1985. Porter's approach highlights actual and potential areas of competitive advantage for the firm. Porter argued that individual firms have their own value chains that are embedded in value networks and each of which have different functions within an industry or sector that influence and/or are influenced by other actors in the network. The prominence of Porter's discussion was to highlight the interdependences and linkages between vertically arrayed actors in the creation of value for a firm.

This value chain is an instrument for identifying the value created at each step in the production, and how a firm should position itself in the market and in relationship with suppliers, buyers and competitors. Porter (1980) argued that the sources cannot be detected by looking at a firm as a whole; rather the firm should be disaggregated in a series of primary (directly contribute to add value to the production of goods and service that include inbound and outbound logistics, operations, marketing and sales, and service) and support activities (have an indirect effect on the final value of the product including procurement, technology development, human resource management and infrastructure). In the framework of value chain, it does not coincide with the idea of physical transformation. In Porter's framework the concept therefore has a strict business application. Detecting the source of competitive advantage is valuable information in the business.

Global commodity chains, introduced into literature by Gereffi *et al.* (2001) cover a concept that is mainly focusing on the power relations in the coordination of dispersed, but linked, production systems. This concept is used to examine the ways in which firms and countries are globally integrated and to assess the determinants of global income distribution (Ponte, 2002). Gereffi *et al.* (2001) established four core elements: (a) input-output structure, (b)

territorial (international) structure, (c) institutional framework, and (d) governance structure (Kaplinsky & Morris, 2001).

The focus of Global commodity chains was set on institutional mechanisms and inter-firm relationships with attention paid to balance the power embedded in the coordination of globally fragmented but interlinked production systems. Gereffi *et al.* (2001) concluded that the overall character of the chain is determined by dominant actors. These actors become responsible for upgrading possibilities, knowledge transfer, and interaction coordination within the value chain. According to Ponte (2002) the concept has been applied in the area of quality assurance procedures of agricultural crops such as in coffee.

This concept of Global commodity chain can be enriched by some of the insights gained in *filière* work, especially in terms of improving historical coverage and depth, enlarging the analysis to agricultural commodities, better handling of regulation issues, and including quality convention issues in analyzing commodity chain structure and restructuring.

Based on Gereffi's Global commodity chain, Messner (2002) developed the world economic triangle. This concept is based on the assumption that actors, governance, and regulation systems determine the scope of action in the global commodity chains. This approach further focuses on upgrading entire regions or clusters through their integration into chains. Hence, the horizontal (cluster development) and vertical approaches (value chain) are linked (Kaplinsky & Morris, 2001).

This study has adopted the value chain approach in its analysis of baobab products with the aim of improving the profitability and sustainability of their trade in Malawi. This is in line with one of the objectives of a value chain concept, which is to increase the amount and value of products that actors sell in the value chain. Secondly, this concept has been adopted in the current study with the aim of sustaining the share of harvesters in the chain and increasing the margins/product so that harvesters do not only gain absolute income but also relative income compared to the other actors in the baobab trade. Producers (Harvesters in this study) are crucial actors in any value chain as they are the source of the raw materials for the chain to exist; hence there is a need to concentrate more on them for the sustainability of the trade.

2.2 Conceptual framework

Value chains provide the framework used to analyze the activities and processes involved at situation-specific geographical scales from harvest, production, transformation, processing to consumers (Kaplinsky & Morris, 2001). Munthali (2012) designed a conceptual framework which was used in research that analyzed the genetic characteristics of *Adansonia*. This framework could not be adopted in the current study as it focused more on the genetic characteristics of *Adansonia* and not really on the actors involved in the baobab trade and products produced. Chakma (2011) used a framework on value chain marketing system model in a study on “the role of selected NTFPs for rural areas in Laos.” This framework could also not fit in this study as it concentrated more on political and technological aspects because of the nature of the trade in Laos.

The baobab trade in Malawi has proved to be more of informal than formal where by the political and technological aspects are not yet significant. As such the study uses a conceptual framework presented in Figure 1, developed based on the objectives of the study and theoretical information sourced from various authors (Hishe *et al.*, 2016; De Caluwe, 2011; M4P, 2008; Juliard *et al.*, 2006; Kaplinsky & Morris, 2001).

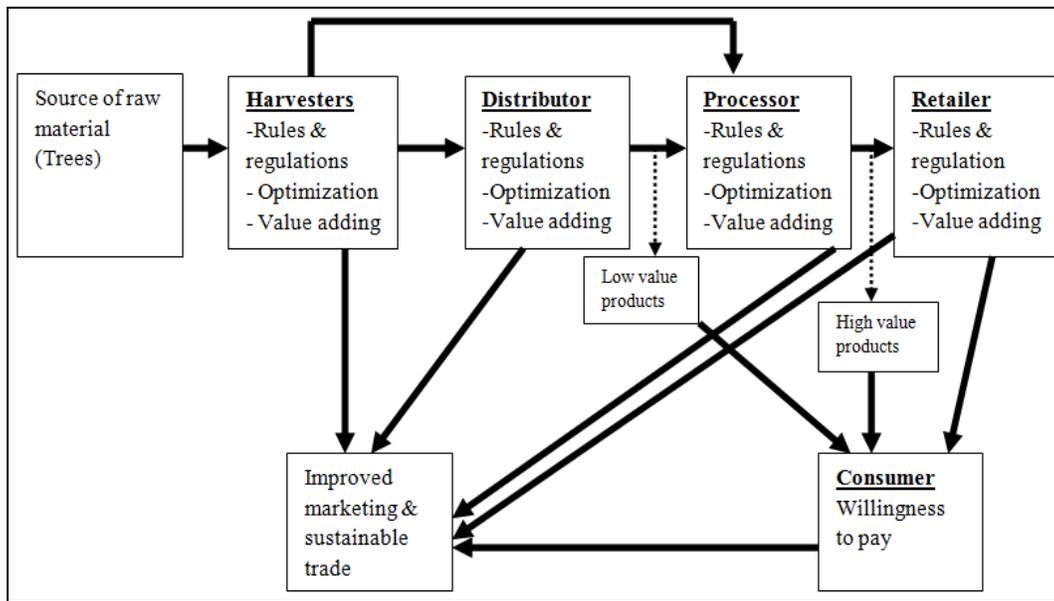


Figure 1: Conceptual framework for value chain analysis of baobab products in Malawi

The starting point of the value chain of baobab products in Malawi is the source from where the raw material (fruits and pulp) comes from. These sources are trees from village forests or individually claimed trees falling on people’s farmlands or found around their homesteads. Upon referring to secondary data, it was discovered that, in a value chain, there are several actors performing several activities in moving the products from the source to the final consumer (De Caluwe, 2011; Marshall *et al.*, 2006). In this case it was harvesters of baobab fruits- wholesalers who transport the raw materials from rural to urban areas in bulk. There

are also some actors who process the raw materials into finished (processed) goods and sell to retailers in formal and/or informal markets. Lastly there are some final consumers who are willing to buy unprocessed goods at a lower price as well as processed goods at a higher price in both formal and informal markets.

As baobab products move from source to the final consumer, value addition takes place through different actors, hence multiple baobab products are found in the country. Upon buying and selling of the baobab products, the societies are improved through consumption and economic gains. As the trade is taking place, there are both formal and informal rules and regulations, policies, standards and certification that govern the baobab trade thereby improving product quality, marketing, and sustainable use of the trees.

2.3 Value chain mapping

Mapping the market means building up an understanding of the different players or actors in the value chain and the relationships between them, along with factors determining how well or badly the chains are (Hellin & Meijer, 2006). By focusing on the whole range of activities and relations, the value chain approach is simultaneously a descriptive tool and an analytical instrument (Jensen, 2009). As a result, mapping the market includes not only mapping core processes and main actors involved in the processes, together with their relationships and linkages, and flows of products; but also mapping quantities and prices of products, geographical flow of products, value at different levels of the chain, flows of information and knowledge, and business services that feed into the chain (van den Berg *et al.*, 2007).

Although the most common way is to draw a map of the different chain actors and the interrelationships amongst them, there is no standard approach to map value chains (Te Velde *et al.*, 2006).

UNIDO (2009) added that during value chain mapping both qualitative and quantitative terms are used in presenting the results. First an initial map is drawn on various actors of the chain, their linkages, activities carried out, links to activities at other domestic or foreign locations, the supporting services and their interactions, the links to the final market, and some initial indications of size and importance. Secondly, the value chain should be quantified focusing on size and scale of main actors, production volume, number of jobs, and sales and export destinations. To avoid an overload of information, several maps are drawn. The resulting maps will depend on the scope and objectives of the type of research conducted and its entry point or dimension.

Albu & Griffith, (2006, 2005) agree with UNIDO (2009); Hellin & Meijer (2006) that mapping value chains begin with mapping the value chain actors and their linkages as the product is moving from primary producer to final consumer. Albu & Griffith (2006, 2005) added that one also maps business environment factors which are generated by structures (national and local authorities, research agencies etc.) and institutions (policies, regulations and practices), that are beyond the direct control of economic actors in the market chain. Finally, one maps business and extension service providers that support or could potentially support the value chain's overall efficiency. The process of mapping the market, if conducted in participation with the market chain actors themselves, can be a powerful way to build understanding and trust between stakeholders.

There is, however, no single blueprint for this participatory approach. This method works on assumption that all value chains are formal in nature to have business and extension service providers to support them. In the case of baobab trade in Malawi, the business is more of an informal than a formal one (Munthali, 2012) and hence business and extension service providers to support the chain's overall efficiency are not vibrant where they exist.

According to Kaplinsky & Morris (2001) having identified the value chain in question, the task is then to put numbers and values to the variables under investigation. Here, the variables chosen will reflect the primary questions being addressed in the research. Leaving aside these specific interests, it is likely that all value chain analysis will gain from constructing a "tree" of input-output relationships which include most of the above procedures. Kaplinsky & Morris (2001) concentrates more on global value chain which can only be followed if one is carrying out a value chain analysis in different countries and disposal after use. In such a way one can track the products flow from the producer to the final consumer and disposal after use in all the countries. The current research could not adopt this method as the last destination is the local final consumer and does not concentrate on how the products move after being exported. Even locally, this study did not go further to look at disposal after use because of the nature of its objectives.

Marshall *et al.* (2006) agrees with Albu & Griffith, (2006, 2005); Hellin & Meijer (2006) and Kaplinsky & Morris (2001) in mapping the value chain. Marshall *et al.* (2006) argued that due to the high degree of complexity of most chains and their overlap with other chains, the

selection of the point of entry is critical. The initial stages of the analysis are to identify the important traders and markets. The research should then move to the next actor along the chain until the end consumer is reached. Once a chain has been developed from producer to consumer, data gaps should be identified and filled with either primary or secondary data. Where appropriate, the results from the value chain analysis should be disseminated to communities, local authorities, and policy decision makers.

The current study agrees with Marshall *et al.* (2006) in such a way that data collected was complimented by secondary data where the researcher failed to collect the primary data. Further to that, part of the research findings of the current study were disseminated to stakeholders in one of the study sites (Karonga district). This was a good initiative as some issues which were not coming out clearly were clarified at this forum and in cooperated in the study.

The current study has likewise identified different actors and their core processes during the mapping exercise. De Caluwe (2011) reported that different actors are involved in moving different products along the chain and each actor has different incentives and abilities to influence the chain (Marshall *et al.*, 2006). The actors of baobab trade in Malawi carry out different activities like harvesting/collecting, drying, packaging, transportation, processing, storage and selling/ marketing and advertising. Keeping in mind that some processes overlap between actors, one is required to just concentrate on the main /core processes carried out by a particular actor in identifying their roles. Upon identifying the actors, one tries to find out their relationships. This now looks at how actors are coordinated both vertically (between)

and horizontally (within). There are some linkages within actors on the same level and between one stage of a chain to the other as highlighted by several authors (De Caluwe, 2011; KIT & IIRR, 2008; M4P (2008).Furthermore, M4P (2008) argued that the maximum core processes should be at least six but not more than seven and the results can be presented in graphs, tables or figures.

Many studies above (UNIDO, 2009; M4P, 2008; Marshall *et al.*, 2006; Albu & Grifith, 2006, 2005; Kaplinsky & Morris, 2001) have highlighted the importance of mapping the value chain in carrying out a value chain analysis. Although the authors have insisted that there is no single way of carrying out a value chain mapping, all authors have emphasized on understanding different players in the chain, finding out how they are coordinated (linked), the core processes carried out by these actors, identifying the supporters, and challenges faced by the actors.

In the current study, functional and institutional analysis (Food Agriculture Organization [FAO], 2005) was used to carry out the value chain mapping by using guidelines provided by M4P (2008). M4P (2008) provides step by step guidelines which can suit both formal and informal trade. This study therefore used M4P (2008) because it is more detailed and because the trade of baobab products in Malawi is predominantly informal (Munthali, 2012).According to Amusa *et al.* (2017) generally NTFPs markets are usually informal with fairly short, although not necessarily simple, supply or market chains. This approach is suitable considering the objectives of the study, type of data collected, time, and resources. Core processes of baobab products were firstly identified as the baobab products move along

the chain to help identifying the main actors involved in the trade and how the actors are coordinated. The approach has helped to achieve the set objective of identifying main actors of baobab trade and map out their relationships.

2.4 Capturing values along the chain

Before one decides on which business to enter, one must first see which business is profitable or not. After mapping the value chains therefore, the next step is to study certain aspects of the value chain in depth. According to M4P (2008) one needs to know that there is a wide choice of aspects that can be further elaborated upon, such as costs and margins. It further says that the cost is the money that an actor in the value chain contributes while the margin is the money that an actor in the value chain receives minus the costs. In addition, analysis of costs and margins enables the researcher to determine how the value chain is favoring the poor. Actual costs and margins should be considered when a researcher aims to find out whether a value chain is a good source of income and it is accessible for the poor. In other words the aim is to know if it is possible to decrease costs and increase revenues. It also helps one to compare the best practice along the chain in order to improve the effectiveness and efficiency of the selected chain.

KIT & IIRR (2008) lend support to M4P (2008) in calculating values in the value chain as it requires various types of information and several steps. More ways of calculating benefits along the chain include revenue, gross income, gross margin, added value, and value share. Revenue is the money one earns by selling the produce, plus any other income earned by selling by-products or waste. Once one knows the costs and revenues of each actor in the chain, it is now possible to calculate their financial positions. Gross income or operating

profit is calculated by deducting variable costs from revenues. The gross income is easy to calculate, but it does not take the fixed costs into account. The gross margin is the gross profit per unit of produce calculated by dividing the gross income by the revenue earned from sales then multiplied by 100 to give a percentage. Again, this ratio neglects the fixed costs. Added value is the amount of value that each actor in the chain adds and it is the difference between the price the actor pays for the produce, and the price she or he sells it for. This is equal to the actor's revenue minus the previous actor's revenue. Value share is the percentage of the final retail price that the actor earns calculated by added value divided by the final retail price then multiplied by 100 to give a percentage (KIT & IIRR, 2008).

This study has adopted KIT & IIRR (2008) step by step procedure in calculating benefits between actors of baobab trade along the value chain. It was relevant to use economic parameters by KIT & IIRR (2008) because they were directly linked with the second objective of this study. The current study did not concentrate on all parameters which take into account the fixed costs as this was difficult to collect as the respondents were not willing to give relevant information or they were using equipment which they received as grants and they did not know how much it was worth. To add on the above, some actors do not keep records and it was hard for them to recall on some of the questions asked. Jensen (2009) also highlighted the issue of not keeping records as a challenge in collecting data. The current study therefore just concentrated on calculations to do with variable costs.

Kaplinsky & Morris (2001) analysed the concept of rent to provide an important analytical vehicle to determine why some activities in the value chain are more rewarding than others. This particularly means that one determines the barriers to entry which eventually limit

competitive pressures. Kaplinsky & Morris (2001) further emphasizes that when one is mapping the distribution of benefits; there is a need to concentrate on profits. The greater the barriers to entry, the higher the level of profitability

2.5 Institutional arrangements and institutions of baobab trade

As described by Geels (2004), institutional arrangements are different informal or formal regimes and coalitions for collective action and inter-agent coordination, ranging from public-private cooperation and contracting schemes, organizational networking to policy arrangements. These arrangements include the linkages between and among organizations at the international, local, state/provincial, and national levels, and between governmental and non-governmental entities, including local community and business leaders. Examples of institutional arrangements as outlined by Hollingsworth & Boyer (1997) and Hollingsworth *et al.* (1994) include associations, corporative, communities, markets and networks. Institutional arrangements as described by (GoM, 2016) include government ministries, departments, civil society and private sector organizations, development partners and traditional leaders.

On the other hand, KIT & IIRR (2008) and Menard (2000) defined institutions as the ‘rules of the game’ which include norms, policies, standards, beliefs, and values. They include both formal and informal rules which range from local to global level, and may give rise to compliance or resistance and they can change over time. According to KIT & IIRR (2008) institutions form the business environment that surrounds the trading activities in the value chain. Additionally, institutions help shape the interactions and incentives in the trade and reduce uncertainty by establishing a stable structure within which players can negotiate.

Strong institutions help actors to do business in a more efficient and beneficial way while weak institutions hinder trade and prevent the creation of wealth.

In order to acknowledge the structures within which lead firms of the value chains work including regulations, the institutional framework was introduced by Gereffi (1995). Institutions at global, national and local levels play a role in shaping value chains. According to Gibbon (2005) actors in value chain are not always in a position to influence how the chains are structured since they themselves are influenced by market regulations. It further argued that institutions include the global level and the specificities of national business systems, market access, communication and government regulations or policies. Therefore, institutions have a strong link to governance, as they establish the economic, political and cultural framework within which actors drive the chain.

Prowse & Moyer Lee (2014) argued in value chain analysis of tobacco carried out in Malawi that institutions refer to international and domestic laws and regulations that influence the chain. The central point here is that each value chain is placed within many national, regional and global institutional frameworks. At national level, actors of value chain should abide by regulations regarding licensing and taxation as well as product and process standards. At each node, actors often form unions or organisations to represent member's interest, while at the regional or global level; actors are subject to multilateral trade agreements. For example, EU, World Trade Organisations as well as bilateral trade reciprocity; and process standards such as classification and grading norms, such as organic or fair-trade practices or lack of child labour (SA8000).

Institutional arrangement comes into action when value chain actors need to face a series of qualification criteria based on products, process and logistic (Kaplinsky & Morris, 2001). Kaplinsky & Morris (2001) further reported that different types of rules are categorized by two sets of factors and these are the extent to which they are codified and whether the rules cover products or processes. The standards may be set in legal codes and subject to fines if transgressed and they may also be internationally recognized, and widely used, even though they have no legal basis. This recognition may be less than global, but cover a number of product markets, or they may be firm specific. Some examples of these different forms of rules and standards are. International Organization for Standards (ISO) 9000 and ISO14000, whilst others are industry specific like the Hazard Analysis Critical Control Point (HACCP) in the food sector. Different rules will often be exercised within the same chain. Gereffi *et al.* (2001) agrees with Kaplinsky & Morris (2001) that there are some rules which are internationally recognized, and widely used.

Miller & Jones (2010) elucidated that among the elements that constitute an enabling environment, quality and safety standards appear as an item of increasing relevance in the value chains. Further to that, Miller & Jones (2010) agree with both Prowse & Moyer Lee (2014) and Kaplinsky & Morris (2001) that a major driver in the integration of value chains has come from the introduction of quality and safety standards and the demands for strict compliance by buyers of the final products. Standards of products require certification to demonstrate concurrence of meeting the minimum standards and those relating to intrinsic value of the products. Miller & Jones (2010) further gave examples of standards including quality, variety, size, shape, as well as brand which are normally determined by the industry norms and companies themselves. To meet market demands, timeline of delivery is another

company-imposed standard. Niche market characteristics that include their own setoff standards, such as for organic produce and regional specific branding, are also becoming more important in the value chains and have demonstrated an opportunity for some actors. Tracing the origin of products and their pathway through the value chain, has been shown to be of increasing importance for both safety as well as branding and this can only be feasible through well-structured and linked value chains

With the review above, it is clear that some rules in the markets are set by supernatural bodies like the EU and these transcend all other rules in importance and can be identified by looking at the legal codes. On the other hand, there are some rules which have no legal backing e.g. pressure on Non-Governmental Organizations (NGOs) for value chains to achieve environmental standards or to exclude child labour. Additionally, there are some rules which govern a value chain but they are informal in nature. This means that these rules have no official legislative backing, for example, key actors in the value chain may require conformance to certain quality-processes. Disadvantages of such informal rules are that there may be miscommunication between actors in the chain or a thin commitment to such rules may be observed.

2.6 Empirical evidence

De Caluwe (2011) conducted a study on market chain analysis of baobab and tamarind products in Mali and Benin to identify all chain actors and describe their characteristics, activities and linkages and map the market(s). Different actors in the trade were identified as

gatherers, traders, processors and consumers. The study revealed that the majority of the gatherers of baobab in Benin and Mali reported to sell their products at farm-gate. Similarly in the current research, some harvesters also sell their baobab fruits at farm gate because of poor road infrastructure or cannot afford paying for transport to take their products to formal markets. De Caluwe (2011) contends that actors of baobab and tamarind products were found to have different and varying functions, such as collecting, transporting, distributing and selling.

De Caluwe (2011) further recommended that chain actors can participate in market relationships by being involved in various activities in the chain (vertical integration) and where actors have a high degree of control over chain management (horizontal integration). It is worth to note that vertical integration will shorten the marketing chain by cutting out traders or other intermediaries. When actors combine both vertical and horizontal integration, they can have full ownership over the chain, for example by building direct linkages with consumers. The current study has also reported about both horizontal and vertical relationships between actors of baobab trade.

A value chain in agricultural finance by Miller & Jones (2010) agrees with De Caluwe (2011) that in a value chain, there are different actors involved in moving a product from the producer to final consumer. Miller & Jones (2010) identified key actors to be producers, dealers, aggregators, wholesalers, processors and retailers. These actors operate in the value chain with linkages into one another. According to Miller & Jones (2010) producers are very important actors in the chain and are a key driver to the sustainability of the value chains. Further to that, Miller & Jones (2010) reported that company processors play a major role in

adding value to the agri-commodity and in many cases link up with wholesalers or retailers to market the product. Additionally, linkages between different players (both vertically and horizontally) were also analyzed in the study by Miller & Jones (2010) and it was argued that these linkages affect the sustainability of the value chain. The efficient linkages can therefore, generate a higher value in the chain while reducing cost and inefficiencies. Three contractual relationships were classified as spot market based, informal trust based, or contracts based relationships. Spot market relationships are prone to various risks with price, quantity, quality as the transactions between different actors are undertaken based on market demand and supply conditions. As such value chain based on such relationships cannot be sustainable. On the other hand contract relationships are considered as the best alternative, but there are risks associated with this type of relationship if the contracts are not honored by actors involved.

In a book of building cooperation between farmers and traders in Africa, KIT & IIRR (2008) highlighted the importance of activities carried out by different actors along the chain and how their relationships are. KIT & IIRR (2008) concurs with De Caluwe (2011) and Miller & Jones (2010) on different actors found along the chain carrying out different activities and the existent of relationships between them. Additionally, the authors of the book reported that traders need to organize themselves if they want to improve their businesses. The authors also recommended horizontal integration type of coordination as it comes with trust and written institutions as compared with adhoc relationship (arm's length) which contributes to cheating and low value addition of the products. Shahidullah & Haque (2010) also reported that spot market relationships come with no trust and dishonesty. Ahanken & Boon (2011) agree with KIT & IIRR (2008) that if actors (especially producers) are not coordinated, there

is a striking note in the practice of intermediaries putting demand before NTFPs collection and advancing payment in form of credits. Similarly, Neumann & Hirsch (2000) reported that these intermediaries tie the collectors to the traders through debt or patron–client type relationships. An association in Mbire district in Zimbabwe helps its members get the best value for their animals by assisting with marketing by organizing the farmers into marketing groups.

In making value chains work better for the poor, M4P (2008) emphasized the importance of strengthening linkages or relationships between different actors involved in a value chain. Since a value chain encompasses different actors carrying out different but coordinated activities, it is important that there are linkages between actors on the same level as well as between different levels. Strengthening relationships between actors in a value chain lays the groundwork for improvements to constraints, establishment of contracts and transportation systems, quality and market information. Horizontal linkages were observed between different ginning companies operating in Zambia, while each one of the companies has their vertically integration production and value chains. In Malawi, relationship amongst actors on the same level has been observed in the current research, whereby members of harvesters were seen working in an association. Additionally, horizontal relationship exists between Zankhalango Association and Tree Crops Limited. One of the immediate advantages which come with this type of relation is easy access to training and market information.

Shahidullah & Haque (2010) carried a study on economic potential of medicinal plants in Bangladesh and suggested that a vertical integration is needed in order to benefit producers and processors at the beginning of the value chain. The authors argue that some of the

mechanisms employed in developing and sustaining institutional relationships may also apply equally well to defining the medicinal plant value chain and list contracts, quasi-vertical integration, tapered vertical integration, cost plus agreement, and joint ventures. Moreover, Shahidullah & Haque (2010) reported that integrated value chain enables primary producers to become active participants, removes market access barriers, results in better commercialization of products, and is attractive to companies as they can have greater control over quality and supply. Because of the horizontal relationship existing between exporter and the association of harvesters, it has been discovered that there is quality baobab pulp exported to international market. This is achieved through fruit handling training which is offered to the harvesters and access to “pure” packaging material provided by the exporter.

Collective action has more advantages than negative effects as far as value chain is concerned. Many authors (Gruere *et al.*, 2009; Kruijssen *et al.*, 2009; Markelova *et al.*, 2009) reported that smallholder farmers can reduce transaction costs, obtain necessary market information, secure access to new technologies and options, and improve market access by acting collectively. Bolwig *et al.* (2010) and Pandey (2010) reported that an unorganized and imperfect market system means that Malta orange growers scattered across the hill areas have little bargaining power and are generally forced to sell to intermediaries at a very low price. Their findings collaborate with those of Ton (2008) that indicates that collective action improves smallholders’ market access and gains. Horizontal contractualization leads to a better coordination among producers in aggregating products, maintaining quality standards, accessing inputs, and improving bargaining power while vertical contractualization leads to better integration and relationships with traders and sellers.

On sharing of benefits, Gumma (2011) carried a research on contribution of local level trade in NTFPs to rural development in Sudan. Gumma (2011) found that collectors of baobab fruits earned an average gross profit of US\$331.55 per annum. The mean total income for a collector was US\$336.52, annually. However, there was noticeable variation in annual average gross profit which was largely attributed to the personal characteristics of the household and resource access. The gross margin per hour of work was US\$2.1768 and US\$17.4144 per day, which is above the ongoing wage rate of semi-skilled labor (US\$3.33) per day. The fruit collectors were thus able to earn US\$14.11 more net cash income for their effort than the average wage rate of semi-skilled labor in Sudan, although only for a maximum of three months per year, the length of the fruit season. The case is similar with baobab harvesters in Malawi whereby harvesters of baobab fruits earned more (Table 6) than the average wage rate of US\$0.15. One thing to note is that though the harvesters seem to earn more, this only last for a period when the baobab products (maximum of three months) are in season per year.

Actors along the value chain face some challenges and one of it being high costs. Cost of packaging material was found to be the highest cost that processors in Mali and Benin face (De Caluwe, 2011). Handling costs, including the cost of packaging material, were also reported by Shepherd (2007) and Fafchamps (2004) to represent 20-30% of the marketing margin of processors. Similarly, Gumma (2011) reported about the main constraints mentioned by collectors related to the seasonality of the fruits (100%), transportation costs (90.8%), pricing strategies (42.1%), number of markets (78.9%) and resource access (90.8%).

Traders were reported to have higher margins than smallholders, and in particular, travelling wholesalers were those profiting most (Schreckenber, 2003). In addition, Akinnifesi *et al.* (2008) also reported that retailers made more profit than wholesalers, but that producer' profits were intermediate. Cost of packaging has also been reported in the current study to contribute to fewer exporters of baobab products in Malawi. Actors (processors and exporters) are failing to meet the international standards because they cannot afford the recommended packaging material.

Hishe *et al.* (2016) did a review of value chain analysis of medicinal plants and the associated challenges in Ethiopia. The authors argued that despite the fact that the products collected can have very high value in the final products; the small percentage of the final value is what is received by collectors. The collectors receive a small share because they have no idea of the real value; they fail to market it in the form wanted by buyers or are unable to market to the buyers (Shinwari & Qaiser, 2011; FAO, 2005). According to these authors, a key element of value chain debates has been an assessment of the relative benefits to the primary producers, as compared to intermediaries, wholesalers, and retailers. Hishe *et al.* (2016) agree with Litvinoff & Madeley (2007) that farmers only obtained a minimal share in the benefits of the products by selling their products in informal markets because of poor road infrastructure. Chakma (2011) documented that several related studies (Mhapa, 2011; Piya *et al.*, 2011) have shown that collectors have the smallest profit margin in the NTFPs market chain. Hishe *et al.* (2016) contend that the strengthening of norms and standards for

medicines, as international markets demand, should lead to effective medicines being available and accessible on the local market.

Several challenges faced by actors in the value chain were highlighted by Amusa *et al.* (2017); Gumma (2011); KIT & IIRR (2008); and Marshall *et al.* (2006). Some of the challenges include high transportation costs, high cost of packaging, and lack of market information. All the above challenges were also identified in the current study by actors involved in the baobab trade. It is recommended that actors need to be coordinated if they are to overcome some of the above challenges as they can share some of the high costs. Marshall *et al.* (2006) argued that market information and its ability to use that information are thus important prerequisites for entering new markets and maintaining market shares. Incomplete or non-transparent market information leads to what is called market failure (KIT & IIRR, 2008). Ahanken & Boon (2011) and Neumann & Hirsch (2000) argued that lack of market information is commonly recognized to be a major constraint to developing NTFP commercialization. Furthermore, Amusa *et al.* (2017) and Hellin *et al.* (2005) confirmed that smallholders have little or no information on market conditions, prices and quality of goods. In the current study of baobab products in Malawi, lack of market information between actors has also been highlighted. Actors in the trade are lacking information especially on international buyers and how they can penetrate the international markets.

Choudhary *et al.* (2015) did a study on strengthening Malta orange value chains through institutional development in Uttarakhand, India. Choudhary *et al.* (2015) demonstrate that globalization is exposing farmers to new and unfamiliar conditions. According to Leichenko

& O'Brien (2002) although some farmers may be in a position to take advantage of these changes, many more, particularly in the developing world, are facing increased vulnerability. Mountain farmers in India face a host of challenges in marketing their agricultural products due to remoteness, poor physical and economic infrastructure, high transport costs, low volume, inadequate information, poor access to credit and other institutional services, and weak bargaining power (Choudhary *et al.*, 2013; Pandey, 2010). The opportunity for smallholder farmers to raise their incomes depends on their ability to compete in the markets (Markelova *et al.*, 2009; Shepherd 2007). This is constrained by high transaction costs and coordination problems along the production to consumption value chain (Shiferaw *et al.*, 2008). Collective action is the key to overcoming the shortcomings of unreliable and low production and enhancing producers' negotiating power in the value chain (Wymann von Dach *et al.*, 2013). Generally, market constraints often reduce the bargaining power of the poor harvesters supplying the products (Bhattarai *et al.*, 2003). Through coordination, producers can reduce transaction costs, obtain necessary market information, secure access to new technologies and options, and improve market access (Kruijssen *et al.*, 2009).

On institutional framework, certification improves the credibility of the standard, but it entails higher costs for the applicant (KIT & IIRR, 2008). Additionally, KIT & IIRR (2008) highlighted the importance of standards in a value chain to make trade more efficient, more remunerative, and more client-oriented. Gibbon & Ponte (2005) reported that standards are important as they determine access to specific segments of markets. Certification not only adds value to the product, but also makes the product unique by differentiating it from similar products.

As reported by Kaplinsky (2010) by the end of the 20th century, private sector standards had become an integral part in most global value chains feeding production into global markets, more especially for final consumption. Standards are a set of technical specifications that define quality features, size, weight and/or packaging of a product (De Caluwe, 2011). Standards help to make trade more efficient, more remunerative and more client-oriented although they come with high costs (KIT & IIRR, 2008). According to Gruenward & Galizia (2005) due to an increased demand for health and natural products in food and beverages, botanical remedies and nutraceuticals, and natural cosmetics, the demand for organically certified and fair trade products has grown and today the health claims have a strong influence on marketing. Similarly, Welford & Breton (2008) documented that consumers are becoming increasingly aware of the social and environmental impacts of their consumption patterns and are correspondingly eager to see tangible evidence that these impacts are not negative.

Schmitt *et al.* (2008) also highlighted the importance of certifying products in the international market as a suitable instrument to communicate food quality and to ensure consumers' confidence in the product. The quality of the final product is dependent upon the quality of the raw material and the origin is a guarantee of quality for many consumers (Gruenward & Galizia, 2005). Welford & Breton (2008) further documented that this is a trend that is unlikely to diminish, especially in the natural products sector. Kaplinsky *et al.* (2010) highlighted that standards are firm specific or driven by organizations reflecting the interests of the cooperate sector, such as the ISO 9000 and ISO14000. Importers are increasingly demanding multiple certifications that include bioorganic certified, fair trade

standards, traceability or sustainable wild harvest certifications which are not provided by EcoCert (Juliard *et al.*, 2006).

Formalization of the natural product trade in Southern Africa was carried out by Wynberg *et al.* (2015). This article examined efforts to formalize the bio trade component of natural product commercialization, while addressing the blurred regulatory lines that increasingly exist between bio-trade and bio-prospecting. In this study Wynberg *et al.* (2015) showed that baobab trade permits are costly and time-consuming especially for export market in Zimbabwe. For example, all traders of baobab products must pay annual marketing levy of US\$10 to rural district council. Additionally, bulk harvesters pay a fee of US\$20 to Forest Commission so that they monitor volumes sold outside the ward. Forest Commission fee of 1% of the value of baobab goods is levied at the point of export and exporters produce a permit showing appropriate harvesting. Because of the above costly and long processes, small businesses and entrepreneurs have struggled with the baobab business. Leakage has also occurred across political boundaries as actors of baobab trade seek alternative economic opportunities.

Wardell & Lund (2006) describes the negative impacts of colonial formalization on women trading shea products across borders, and is in line with other studies that emphasize the lack of policy support for women engaged in high-risk activities associated with travel to markets (Mwangi & Mai, 2011; Shackleton *et al.*, 2011). In common with poorly formulated NTFP regulations elsewhere in the world, Lele *et al.* (2010) and Ndoye & Awono, (2010) argue that formalization has led to increased corruption and exploitation of traders and producers, who are now required to pay bribes to customs officials to circumvent the complex and costly

permitting bureaucracy. Schepers, (2010) and Putzel (2009) documented that lengthy delays in issuing bio-prospecting agreements have had negative financial consequences for companies- big and small.

Wynberg *et al.* (2015) further argued that formalization has undermined already marginalized producers and traders, and has benefited those with already greater advantages. At the same time, the introduction of statutory policies and state institutions has weakened many customary practices and institutions that once regulated baobab harvest and use (Wynberg & Laird, 2007). Furthermore, Wynberg & Laird (2007) argue that in Zimbabwe, the inappropriate regulation of baobab led to increased corruption, burdened producers and traders, distorted the use and trade of baobab, and significantly reduced livelihood benefits for local harvesters and traders. Additionally, Pierce & Laird, 2003, documented that small-scale producers of NTFPs that feed into this market have found themselves drawn center stage into often complex, shifting and expensive certification scenarios that, also, may be serving as a barrier to trade. Additionally, Bruce & Larioya, (2007); Gulbrandsen (2005) notes that inconsistent and poorly communicated certification schemes have lessened the credibility of certification initiatives and reduced consumer confidence in the claims made by retailers. Even Lewis *et al.* (2006) reported on the rigorous requirements for complex internal control systems that may not be appropriate to small scale producers. Finally, Faccor & Stephens (2006) have continued to argue that the increasing demand for certified NTFPs in global markets fails to acknowledge the inherent difficulties faced by rural African producers in attaining the standards required for certification.

On the other hand, Welford & Breton (2008) emphasized that in the competitive natural products market, product certification is an important mechanism for retailers to differentiate their products. Furthermore, Welford & Breton (2008) indicated that certification can increase benefit-flows to small-scale producers and incentives for producers to invest in more sustainable harvesting practices.

In the current study, one of the challenges brought forward by actors contributing to failure to market their products in formal markets both locally and internationally was that the certification process is costly and takes long. And despite the disadvantages which come with certification process, the current research still insist that actors of baobab trade in Malawi need to go through it. When products are certified, it means that they have met the relevant quality criteria; as a result actors sell them at a higher price. Certified products have the ability to break into new markets and maximize the potential of existing markets. To add on the above, certification enables the products to stand out from the competition with a clearly visible mark representing quality. To improve the baobab trade and marketing, certification body in Malawi should continue conducting consistent inspections to verify that processors practices remain consistent over time and that consumers of baobab products are protected by eating quality products.

Formalizing the trade of baobab in Malawi will assist the harvesters in harvesting baobab fruits which are well matured and dry to process products which have long shelf life and are allowed in chain stores and on international markets. Regulating the trade will set up recommended measuring units of trade and their recommended prices, thereby benefitting all actors involved in the trade. If the trade of baobab products is formalized, it will create an

enabling environment where by banks and other financial institutions will be available to lend their services like loans to actors involved, in so doing actors of the trade will have enough capital to start or boost their business.

CHAPTER THREE

MATERIALS AND METHODS

This chapter starts with a brief overview of the study area and continues to explain the research design for each objective outlined in section 1.4. It also includes the data collection processes for each objective and lastly, outlines the methods used to analyze the data collected, again specified by each objective.

3.1 Study area

The study was conducted in Karonga, Salima, and Mangochi districts. Following the baobab value chain, additional data for baobab companies, retailers, and wholesalers was collected in Lilongwe, Blantyre, and Mzuzu (in Mzimba district) cities (Figure 2). The ecological characteristics of districts where baobab grows (Karonga, Salima, and Mangochi) were observed with respect to silvicultural zones L and BA (Hardcastle, 1978) (Table 2). Hardcastle (1978) zones BA and L have altitude range of between 200m to 700m mean annual temperature of 22°C –25°C, annual precipitation of at least 700mm and 840mm. On the one hand, Karonga, Salima, and Mangochi districts are where baobab trees grow and where the dominant baobab products are raw (fruits and pulp), with few company processors. On the other hand, Mzuzu, Lilongwe, and Blantyre cities are where baobab raw materials are found all year round. In these cities, one finds many processors of baobab products (both at household and company level). The study areas were selected because of the abundance of baobab trees and active trade in baobab products (Munthali, 2012).

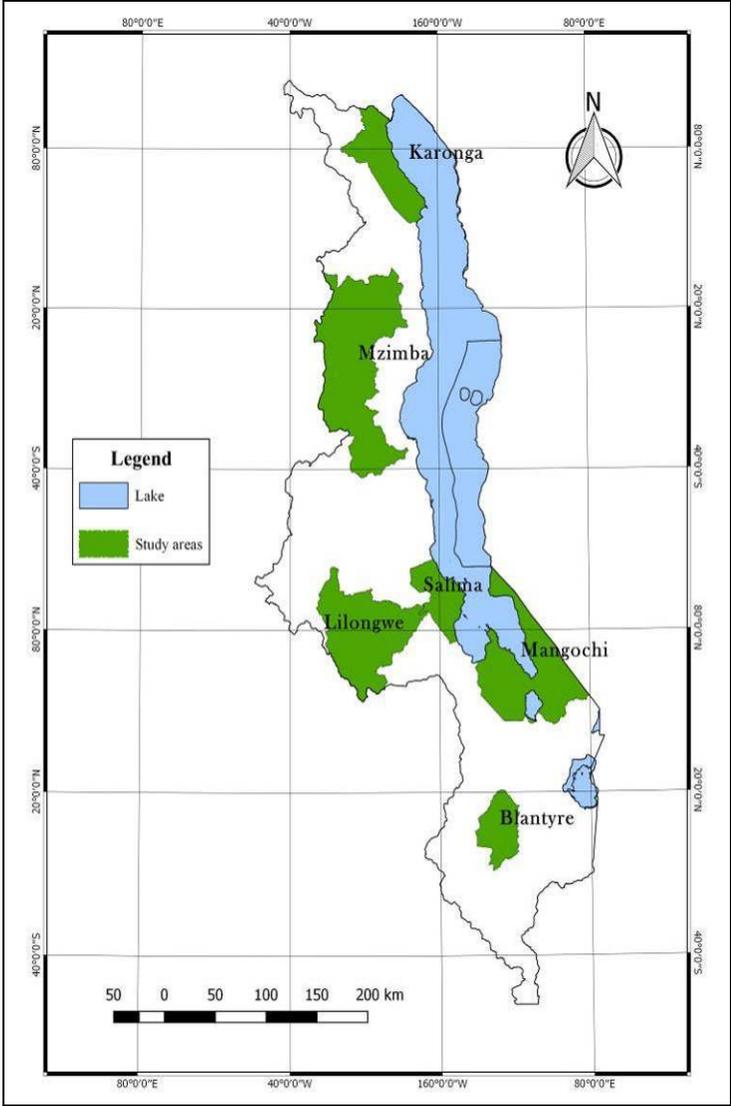


Figure 2: Study sites

Table 2: Ecological characteristics of study sites

District	Coordinates	Average annual temperature (°C)	Average annual rainfall (mm)	Elevation (m)	Soil type	Silvicultural zone
Karonga	9°57'.13"S 33°55'.36"E	23-25	>1600	475-1000	Ferrisols dominant ; regosols	L
Salima	14°25'.17"S 34°27'.11"E	20-25	710-850	200-1200	Alluvial calcimorphic soils above the vertisols	BA
Mangochi	14°25'.17"S 35°12'.43"E	20-25	710-850	200-1200	Alluvial calcimorphic soils above the vertisols	BA

Data source: Hardcastle (1978)

3.2 Research design and sampling procedure

This research study adopted a qualitative design and also employed two qualitative sampling procedures. This study adopted qualitative design for all of the objectives as the research was in the form of a survey. In this approach, surveys involve emerging questions and procedures. Data is collected in participant's setting, data analysis is built from particular to general themes, and the researcher makes interpretations on the meaning of the data collected. Individual as well as group surveys are carried out to get both individual and collective responses (Creswell *et al.*, 2006).

The sampling procedures were purposive and snow-balling techniques. Purposive sampling is a non-probability sampling method that occurs when elements selected for the sample are chosen by the researchers' judgment (Godambe, 1982). Purposive sampling as one of the

non-probability sampling is the most effective when researchers are studying a certain domain of the population with knowledgeable respondents within and it may be used in both qualitative and quantitative research techniques (Tongco, 2007).

In this study, districts and respondents were purposively sampled upon meeting a set of criteria. The district and study sites were purposively sampled based on availability of large populations of baobab trees and marketing activities of baobab products (Munthali, 2012). Participants in this study included members of households in the baobab districts having baobab trees and/or selling baobab products, traders selling baobab products in both local and urban markets, owners and managers of companies processing and selling baobab products, government officials or key players further up the chain, and final consumers of baobab products. These actors were purposively selected to permit the collection of more in-depth and reliable data (Wollenberg, 2000).

Baobab harvesters were either family member who owned baobab trees, sold baobab products and lived in the villages with or near baobab trees or those in the villages but employed by others to harvest fruits. Baobab wholesalers were those traders who bought baobab raw materials (fruits and pulp) in bulk, stored and sold gradually in different measuring units, mostly in semi-urban and city markets. Processors were small household enterprises or fairly large formal firms who processed different baobab products from raw materials. Retailers' main role was the distribution of processed baobab products to consumers. Consumers of baobab products can be described as those that purchased and/or used baobab products from both the formal and informal markets. Finally, exporters are

companies which bought baobab raw materials and sold processed baobab products in international markets.

According to (Tongco, 2007), the snow-balling technique (also known as chain-referral sampling) is also a non-probability sampling method used when characteristics to be sampled are rare and difficult to find. This sampling method involves primary data sources nominating other potential primary data sources to be used in the research. In this study, it was important to use this type of sampling technique because the aim was to follow the baobab products as they moved or differentiated from one actor to the next until they reached their last destination (final consumer). It was also relevant to use this sampling technique because as we move up the chain, few actors are observed (Ferris *et al.*, 2006). Respondents (actors) were interviewed if they had shown willingness to do so.

3.3 Data collection

Data was collected in February 2016 and in February and March 2017. Data was collected in different villages as shown in Table 3. A questionnaire (Appendix A) was used when conducting individual interviews while a checklist (Appendix Band C) was used when carrying out Focus Group Discussions (FGDs) as well as key informant (KI) interviews.

3.3.1 Data to identify the actors involved in baobab trade along the value chain and mapping out their relationships

Individual/household interviews were conducted in a one-to-one conversational manner which was directed along the lines of topics specific to this study. Interviews are the most

important sources of data collection (Yin, 1994). A semi-structured questionnaire (Appendix A) was developed and tested during the reconnaissance survey. The interviews were carried out in homes and market places. For individual interviews, at least three actors at each stage of the chain per district were conducted for the actor types which were available. da Silva & de Souza Filho (2007) and Ferris *et al.* (2006) recommend a minimum of three to five actors per chain as a rule of thumb. In total 70 individuals, five retailers and six companies were interviewed in this study (Tables 3 and 4).

Data collected were, type of actor, household characteristics, sources of baobab products, use of baobab products, product availability period, location of buyers, who buys the products and supporters of baobab trade.

3.3.2 Data to calculate the benefits earned by economic actors from baobab trade along the value chain

Economic parameters of baobab trade were captured using a questionnaire (Appendix A) during individual interviews with all actors of baobab trade. A checklist (Appendix B) was also used while conducting FGDs with actors working in clubs/association. A minimum of eight participants was used as a benchmark for members representing a group, in line with the recommendation by Krueger (2014), who suggests that a minimum of eight participants in a FGD is ideal.

Data of quantities where baobab products are packaged was collected in Kilograms (Kgs), gram (gm), Litres (L) and number of tablets and sachets. Data collection also concentrated on variable costs (MK), buying and selling price (MK) and revenues (MK) collected per season.

3.3.3 Identifying the institutional arrangements and institutions of baobab trade

Firstly, FGDs were carried out with actors of baobab trade by using a checklist (Appendix B). In total, six FGDs were carried out (Table 4). Out of the six FGDs, four were carried out with clubs under an association of baobab harvesters in Mangochi and Salima districts while the remaining two FGDs were carried out with household processors and vendors of baobab in Karonga district and Mzuzu City, respectively.

Additionally, KI interviews were conducted, using a checklist (Appendix C), with traditional leaders, members of staff from the Department of Forestry, Ministry of Agriculture, Ministry of Industry and Trade, Malawi Bureau of Standards (MBS), and Malawi Revenue Authority (MRA). A total of ten key informants (Table 4) were interviewed. According to Bernard (2002), key informants are observant, reflective members of the community of interest who know much about the area of interest and are both able and willing to share their knowledge. Data collected focused on bodies connected with baobab trade, rules, regulations, policies and by-laws (both formal and informal) and challenges faced by baobab actors.

For all the objectives of this study, direct observations were carried out during the visits to villages and markets by the researcher, providing an opportunity to observe what was actually going on. Data from direct observations was used to cross-check the data gained from interviews. Additionally, secondary data review was gathered using desk research, especially on analyzing the institutional arrangements and institutions of baobab trade globally. In this method, previous publications on similar studies and other relevant documents were reviewed to compliment the data collected locally on the whole study.

Table 3: Districts, villages and number of interviews per baobab chain actor

District	Village	Number of Harvesters	Number of Wholesalers	Number of Household processors	Number of Consumers
Karonga	Lupembe	-	3	2	3
	Mpata	3	2	1	-
Salima	Lifidzi	2	3	-	1
	Lumwira	3	1	1	2
Mangochi	Madeco	2	3	3	3
	Mbwadzulu	3	1	-	-
Lilongwe	Nchesi	-	8	3	3
Blantyre	Blantyre	-	8	3	3
TOTAL		13	29	13	15

Source: Field survey (2016-2017)

Table 4: Districts, number of interviews for retailers, KIs, companies and FGDs

District	Retailers	Key Informants	Companies	Focus Group Discussions
Karonga	-	2	-	1 (8 participants)
Salima	-	1	-	2 (26 participants)
Mangochi	1	2	-	2 (31 participants)
Mzuzu	-	-	-	1 (11 participants)
Lilongwe	3	3	4	-
Blantyre	1	2	2	-
TOTAL	5	10	6	6 (76 participants)

Source: Field survey (2016-2017)

3.4 Data Analysis

Quantitative data from questionnaires was coded and then entered into Statistical Package for Social Sciences (SPSS) version 19.0 data sheet. Thereafter data was verified by checking the categories of all variables for correction. The next step was to run SPSS to analyze the data as descriptive statistics. Tables, figures, frequencies distribution and percentages were used to present the results. Qualitative data that was collected through household and KI interviews, FGDs, direct observations and secondary data was narrated and summarized to

identify the actor types, establish relationship types, list challenges faced by actors along the chain, and examine the institutional arrangements and institutions governing the trade.

3.4.1 Identifying actors in baobab trade along the value chain and their relationships

A value chain map was developed to describe the actors and map out their relationships. The value chain map was developed by carrying out a functional and institutional analysis (FAO, 2005) which starts with constructing a preliminary map of a particular chain to provide an overview of all chain actors (institutional analysis) and the type of interaction amongst them (functional analysis). In this study the researcher concentrated only on the core processes carried out by an actor keeping in mind that some similar processes were carried out by different actors. The map was generated starting from the source of the products and tracking the products as they transformed from raw materials to final products. Core processes of baobab products were firstly identified as the baobab products moved along the chain. Main actors involved in the core processes were identified and their relationships mapped. Geographical flow of the products was marked and type of baobab products was labeled. Coordination between actors in this study was used to map out their relationships depending on how they worked. Supporters of baobab trade were also identified in the mapping exercise.

3.4.2 Analyzing distribution of benefits from baobab trade along the value chain

Economic data on quantities, unit prices, variable costs, gross income, gross margins, and value share was analyzed following steps in KIT & IIRR (2008). It should be emphasized that in this study the researcher managed to collect data on variable costs without fixed costs

and all calculations were based on such. Variable costs in this study encompassed all the costs that were changing according to the produce handled such as transport, accommodation, labor, stock purchase, food, packaging, loading and offloading, market fee, storage, and others.

Total revenue was estimated using the following equation:

$$TR = TQ * UP \quad \text{Equation 1}$$

Where,

TR is the Total revenue (MK),

TQ is Total Quantity (in different units), and

UP Is Unit Price (MK)

Total variable cost was achieved by use of the following equation:

$$TVC = AVC * Q \quad \text{Equation 2}$$

Where,

TVC is the Total Variable Cost (MK),

AVC is the Average Variable Cost (MK), and

Q (in different units) is the Quantity.

Gross income was calculated by deducting total variable costs from total revenues

$$GI = TR - TVC$$

Equation 3

Where,

GI Gross Income (MK),

TR is the Total Revenue (MK), and

TVC is the Total Variable Cost (MK).

Gross Margin is the gross income per unit of produce, calculated by dividing the gross income by the total revenue then multiply by 100 to give a percentage.

$$GM = (GI / TR) * 100$$

Equation 4

Where,

GM is the Gross Margin (%),

GI is the Gross Income (MK), and

TR is the Total Revenue (MK).

Gross margin was fit for this study as it just captured variable costs and not fixed costs. This was so because it was not easy to ascertain fixed costs for most of the actors as they appeared to have either received grants, loans, did not keep records and, most importantly, they were not willing to divulge information on the investments.

Based on selling and buying price, Added Value (AV) was calculated. AV is the amount of value that each actor in the chain adds. It is the difference between the price the actor pays for the produce, and the price she or he sells it for.

$$AV = PRA - PPA \quad \text{Equation 5}$$

Where,

AV = Added Value,

PRA = Price received by actor, and

PPA = Price paid by actor.

Value Share (VS) is the percentage of the final, retail price that the actors earn and is calculated as the added value divided by the final retail price then multiply by 100 to get a percentage.

$$VS = (AV / FRP) * 100 \quad \text{Equation 6}$$

Where,

VS = Value Share,

AV = Added Value,

FRP = Final Retail Price.

Friedman's Two Way Analysis of Variance by Ranks; a Non Parametric Test was used to test the Null Hypothesis that the distribution of variable costs, revenue and gross income, is the same across categories of actors at 0.05 significance level. The test statistics was selected because actors along the value chain were considered as blocks.

3.4.3 Analyzing institutional arrangements and institutions of baobab trade

Content and narrative analyses on institutional arrangements and institutions along the baobab value chain were carried. In this analysis, a systematic reading or observations of the information gathered through secondary data, individual interviews, FGDs and KI interviews on institutional arrangements and institutions of baobab trade were carried out to indicate the presence of interesting or meaningful patterns.

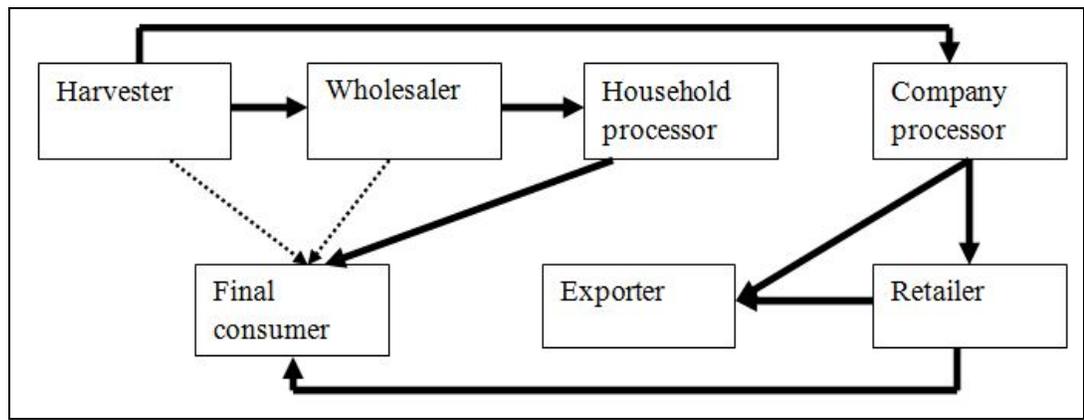
CHAPTER FOUR

RESULTS

This chapter presents results on the marketing channel of baobab, value chain mapping in which core processes, actors and their relationships were identified. The map shows data through graphs presenting the various actors in the chain, their linkages and operations from supply of products through processing to markets; local and international. The results also show the location of the actors and baobab products together with their flow. Value share, variable costs, gross income and gross margins for baobab actors are also presented in this section. Lastly this section presents results on institutional arrangements and institutions of baobab trade at international, national, district, and local levels.

4.1 Actors and their relationships along the value chain in the baobab trade

The identified actors involved in baobab trade in Malawi are depicted in Figure 3. These are harvesters, wholesalers, processors, retailers, final local consumers and exporters. The chain of baobab trade starts with household harvesters gathering baobab fruits and selling to wholesalers, processors and the fruits are consumed by final consumers.



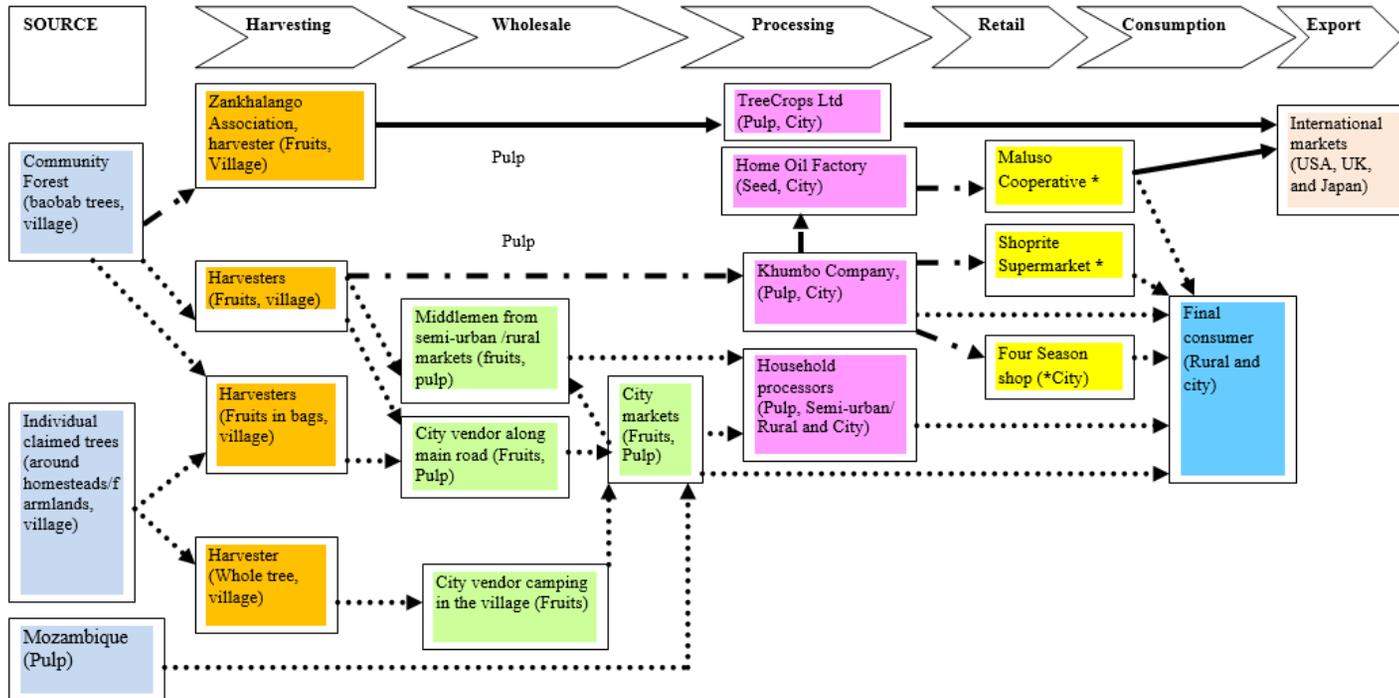
Key:
 Major route 
 Minor route 

Figure 3: Actors involved in baobab trade in Malawi

Six core processes and respective actors were identified through the M4P (2008) procedure described in Chapter three. These processes are harvesting, wholesale, processing, retail, consumption and export (Figure 4). The flow of baobab raw materials from source to final markets is shown using three different relationship arrows. Three types of relationships existing between actors in baobab trade in Malawi were identified during the mapping exercise (Figure 4) namely, spot market relationship also known as arm’s length or adhoc relationship. In this relationship, negotiation between buyer and seller and the whole transaction happens on the spot. Persistent network relationships occur where actors have a preference for transacting with each other time and time again and this type of relationship can be formalized although this may not be a necessity. The horizontal integration relationship is where both actors share the same legal ownership by signing contracts or agreements regarding their business. In the value chain of baobab products, spot market

relationship is the most dominant amongst the actors involved. Two main sources of baobab products in Malawi are identified as community forests and individually claimed trees by households.

SUPPORTERS	Exporter	Banks Transporters	MBS Banks Ministry of Industry and Trade Transporters	MBS	MBS Ministry of Industry and Trade Research Institutions
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BUSINESS SERVICES	Fruit handling training	Loans Logistics	Quality standards Loans Market linkages Logistics	Quality standards	Quality standards Business licensing Phytosanitary certificate
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*assorted processed baobab products

Key:

Horizontal relationship	—————▶
Persistent network relationship	- · - ▶
Spot market relationship	········▶

Figure 4: Value chain map for baobab products in Malawi

Some of the supporters of baobab trade include banks, transporters, MBS and research institutions (Figure 4). The supporters offer a range of services including, loans, logistics, quality standards and phytosanitary certificates to different baobab actors along the value chain.

4.1.1 Harvesters of baobab

Two categories of baobab harvesters were identified in this study as those working in clubs such as Zankhalango Association (Figure 5) and those that are working as individuals (Figure 6). Members of four clubs (51% men and 49% women), each belonging to an association, were identified in this study (Figure 5). These members collect fruits which have fallen onto the ground from baobab trees in community forests only. After collecting the fruits, they are sun-dried (Appendix D), crushed into baobab pulp, packaged and supplied to an export company in Lilongwe (Figure 4).

Skilled harvesters who work individually are either owners of the trees or casual labourers employed by owners and/or wholesalers. Thirteen skilled harvesters were identified comprising 77% men and 23% women. They harvest fruits by climbing the trees (Figure 6) and/or collect fruits which have fallen on the ground. These harvesters sell baobab fruits and pulp to wholesalers, processors and final consumers (in very small quantities) (Figure 4).



Figure 5: Members of Maldeco club under Zankhalango Association involved in harvesting baobab fruits in Mangochi district



Figure 6: A skilled harvester climbing a baobab tree with aid of stakes

4.1.2 Wholesalers of baobab

A total of twenty nine wholesalers (11% women, 89% men) were identified in this study. Wholesalers in the baobab trade in this study are vendors or middlemen who reside in the cities and semi-urban areas, respectively, but buy baobab fruits or pulp in bulk from harvesters in the villages. These camp in the villages or along the roadside and gather baobab products from scattered places using oxcarts or bicycles. Wholesalers also import baobab pulp from Mozambique by use of trucks. Figure 7 shows wholesalers waiting to load baobab fruits along the road side to be transported to cities and a kiosk of baobab pulp and related ingredients in city market (Lilongwe). Wholesalers sell their products to household processors and final consumers (Figure 4).



Figure 7: Vendors along the road (A); Kiosk of baobab pulp and related ingredients (B)

4.1.3 Processors of baobab

Baobab processors in Malawi have been observed at household and company levels. Thirteen household processors (31% men, 69% women) were identified in this study, mainly processing baobab ice-lollies and sweets (Figure 8) using basic household equipment such as pots and pails. These products are simple to make and do not require any specialized skills

other than use of food colouring, water and baobab pulp as raw materials. Plastic tubing is used for packaging.

Nine companies involved in processing baobab were identified in this study. Only six were interviewed as they were willing to provide information. Four of these sell their products locally (Khumbo Oil Refinery, Home Oil Company, Naturals M Limited and Praise Foods Company) while the other two (TreeCrops Limited and Maluso Cooperative Union) sell their products in both local and international markets. The most common products processed by companies are baobab oil, powder, coffee, juice, jam, lip balm and soap (Figure 9).



Figure 8: Left: Baobab sweets (coloured and sweetened), Right: Ice-lolly at household level



Key: 1=Jam 2= Oil 3=Coffee 4=Powder 5=Soap 6=Lip balm

Figure 9: Assorted baobab products processed at company level by different actors

Three categories of companies have been classified in this study based on the number of products processed and their markets. Small companies are those that produce juice only and sell locally, medium comprises companies processing multi-products which are sold locally and large companies process products which are sold in both local and international markets. Raw materials from which all these products are made are baobab powder and seed. Baobab pulp is processed into powder to produce juice and the residue makes jam. Baobab oil is extracted from the seed after removing the powder and it (oil) is a raw material for lip balm and soap. Roasting and then grinding baobab seed produces coffee. The by-products of seed are sludge and cake. Processors sell their products to retailers, final consumers, and international markets. These companies are using mechanised equipment as seen in Figure 10.



Figure 10: Oil processing machine at Home Oil Company in Blantyre

4.1.4 Retailers of baobab

Retailing outlets for baobab products include the formal (including Shoprite, Peoples Trading Centre, Chipiku stores) and the informal markets (Four ways markets, football grounds, under a tree). Five formal retail outlets were identified including the supermarkets, souvenir shops, and a cooperative union which buys final products and adds value (Figure 4). Figure 11 shows men buying baobab fruits at Karonga main market, cooler box with baobab lollies on top and a shelf with baobab juice in Shoprite supermarket. All of the retailers sell their baobab products to final consumers while Maluso Cooperative Union sells to final consumers and international markets.



Figure 11: Baobab products being sold at Karonga main market and in Shoprite supermarket.

4.1.5 Consumers of baobab

Local final consumers (n=15) were identified in this study. Consumers of baobab products are found in both rural and urban areas. They consume not only raw products but also processed products bought from both formal and informal markets. Some consumers are willing to pay for high valued products like juice in Shoprite supermarket (Figure 12) while others pay for low valued products.



Figure 12: Consumer picking baobab juice of different flavours in Shoprite supermarket

4.1.6 Exporters of baobab

The study identified two exporters of baobab products namely Tree Crops Limited and Maluso Cooperative Union. These companies fall in the large scale category of processing baobab products and selling to both local and international markets. Powder is exported to USA and the United Kingdom (UK) by an exporting powder company in Lilongwe. The baobab pulp supplied by Zankhalango Association is processed into powder by Tree Crops Limited before being sold. Baobab oil and soap are bought from Home Oil Limited in Blantyre by Maluso Cooperative Union in Lilongwe respectively and is exported to Japan. Baobab oil is re-packaged in 100ml bottles and fragrance by Maluso Cooperative Union is added to it before being exported.

4.2 Distribution of benefits from baobab trade along the value chain

The results in Table 5 show that harvesters get the lowest percentage of the final selling price of the baobab raw materials; fruit (15%) and pulp (48%) than wholesalers. On the other hand,

processors get the highest value share for all processed products sold locally (Juice: 80%), (Coffee: 75%), (Lip balm: 57%) apart from jam which goes to retailers (53%). Exporters earn the highest percentage of the final selling price for all products sold in both local and international markets i.e. powder 58%, oil 60% and soap 84%.

Table 5: Percentage value share of baobab products per chain actor

Baobab product	Harvester	Wholesaler	Processor	Retailer	Exporter	(%)
Fruit	15	85				100
Pulp	48	52				100
Powder		8	22	12	58	100
Juice			80	20		100
Coffee			75	25		100
Oil			13	27	60	100
Soap			12	4	84	100
Jam			47	53		100
Lip balm			57	43		100

Friedman's Two Way Analysis of Variance by Ranks (Appendix E) shows that the distribution of variable costs, revenue, and gross margin are significantly different across categories of actors ($p = 0.001$) as shown in Table 6. Juice Company incurs the highest variable costs (MK110, 682, 101) and revenue (MK280, 933, 190) and the lowest variable costs are incurred by household processors (MK11, 017) and revenue (MK53, 538). Between harvesters, association members earn high gross income (MK556, 667) than those working individually (MK263, 712) while the highest gross income between wholesalers is observed with those purchasing pulp from Mozambique (MK3, 538,480). Juice Company beats all actors of baobab products in accruing the highest gross income of MK170, 251,089. Association harvesters top the gross margin (93%) while the least gross margin (13%) is observed with retailers.

Table 6: Mean variable costs, mean revenue, gross income and gross margin of actors of baobab trade in Malawi

Actor and actor category	Variable Cost (MK) (Mean ± SE)	Revenue (MK) (Mean ± SE)	Gross Income (MK)	Gross Margin (%)
Harvester				
Zankhalango Association	24867 ± 1041	556,667 ± 151,914	517,800	96
Individual	20043 ± 340	263,712 ± 53,334	239,147	92
Wholesaler				
Pulp Mozambique	1,675,125 ± 41,123	5,213,605 ± 89,360	3,538,480	68
Pulp Malawi	612,461 ± 123,189	3,005,722 ± 46,844	2,393,261	80
Whole tree	371,633 ± 49,614	1,194,667 ± 42,667	823,034	69
Fruits in a bag	537,633 ± 87,084	905,956 ± 72,258	368,323	41
Processor				
Naturals M Limited	110,682,101	280,933,190	170,251,089	61
Home Oil Company	3,111,425	8,044,500	4,933,075	61
Household	11,017 ± 1,206	53,538 ± 5,606	42,521	79
Retailer				
Four Season Souvenir shop	300,000	625,000	325,000	52
Shoprite Supermarket	688,000	792,000	104,000	13
Exporter				
Tree Crops Limited	17,610,000	42,000,000	24,390,000	58
Maluso Cooperative Union	1,035,000	5,101,000	4,066,000	80

*1US\$ = MK780

4.3 Institutional arrangements and institutions of baobab trade

Different institutional arrangements and institutions of baobab trade at international, national, district and local levels were identified in this study (Table 7).

Table 7: Institutional arrangements and institutions of baobab trade at different levels

Level	Institutional arrangement	Institution
International	International Organization for Standardization	Quality control systems and environmental standards
International	World Health Organization	Quality standards
International	Fairtrade Labelling Organization	Organic standards for wild- harvested products
International	Ecocert-Afrisco	Organic certification
National	Government of Malawi	Vision 2020
National	Government of Malawi	Malawi Growth and Development Strategy II
National	Government of Malawi	National Environmental Policy, 2004
National	Government of Malawi	Forest Policy
National	Ministry of Industry and Trade (Malawi Bureau of Standards)	Promoting standardization of products in Malawi
National	Research Institutions	Issuing phytosanitary certificates
District	Maluso Cooperative Union	Promote market linkages
Local	Cooperative groups	Value addition of products
Local	Zankhalango Association	Supplying quality baobab raw materials
Local	Baobab market committees	Facilitation of social welfare of wholesalers

Some of the institutional arrangements at an international level include the International Organization for Standardization (ISO) which sets a voluntary quality control system applicable for companies that process, treat, pack, transport, distribute, and trade commodities such as ISO9000 which is for quality procedures and ISO 14000 being for environmental standards, Gruenward & Galizia (2005). Similarly, the World Health Organization (WHO) also develop guidelines for Good Agriculture and Collecting Practices of Medicinal and Aromatic Plants (GACP) providing quality standards in order to assure that the microbiological load is reduced to a minimum and that negative effects on the plants are limited during cultivation, processing and storage. It also plays a role in ensuring sustainable production (Welford & Breton, 2008).

According to PhytoTrade Africa (2008) Fairtrade Labelling Organizations (FLO) develop and review organic standards for wild harvested products by assisting producers in gaining

and maintaining certification and in capitalizing on market opportunities on the Fairtrade market. These standards are developed and reviewed by a committee in which all FLO members, producer organizations, traders and external experts participate to ensure about its transparency. FLO follows ISO 65. Ecocert-Afrisco deals with organic certification of all edible products for international markets according to the respective standards such as the EU regulations or international labels. Ministry of Industry and Trade and agriculture research institutions are at national level, looking at quality standards and issuing phytosanitary certificates respectively. The Cooperative Union only exists in the capital city of Malawi (Lilongwe), promoting market linkages, while at local level falls the cooperative groups, baobab associations and the market committees.

Institutions at these four levels include the standards, certification, policies, goals, rules and regulation. At the highest level are internationally recognized standards and certificates for example, environmental standards, organic certification, conservation, and quality of final products. On the other hand at national level are policies, goals, standards and certificates applied within the country (Malawi). For bodies falling under district and local levels, their rules only apply at district and local level.

CHAPTER FIVE

DISCUSSION

This chapter contains a discussion on the results presented in Chapter four and their implications. The discussion begins with characteristics of different actors involved in the baobab trade with their roles and then discusses the different relationships that exist between baobab actors along the value chain. It further discusses how benefits are shared between different baobab actors along the value chain. Finally, the discussion concentrates on analyzing different institutional arrangements and institutions of baobab trade at international, national, district, and local levels.

5.1 Actors and their relationships along the value chain in the baobab trade

Different actors involved in baobab trade were identified in this study in moving a product from the source to the final consumer and exporting to international markets (Figure 4). These actors play different roles such as harvesting, drying, processing, storing, packaging, and selling of the products, thereby adding value to the product at each stage along the chain. De Caluwe (2011) reported that different actors are involved in moving a product from the source to the final consumer and each actor has different abilities to influence the chain (Marshall *et al.*, 2006).

The first actors to enter the chain of baobab trade in Malawi are harvesters (Figure 4). Harvesters get their baobab fruits from both community forests and individually claimed trees found around the households or farmlands. Fruits are harvested by everybody as the trees grow naturally in the wild. Akinnifesi *et al.* (2005) reported that indigenous fruits from miombo woodlands are particularly central to the livelihood systems of both rural and urban dwellers in Southern Africa. The current study concurs with Akinnifesi *et al.* (2005) that despite baobab trees growing in the rural areas, both the rural and urban communities benefit from them through consumption and trade (Figure 4).

Despite baobab fruits contributing to the rural communities, it should be noted that it was observed that there were no efforts of domesticating the tree as the respondents said it takes many years for the trees to mature and start producing. Even Sidibe & Williams (2002) reported that baobab species take about 8 to 23 years to start fruiting. Harvesters in this study showed willingness to domesticate the baobab trees if and only if they could be supported and trained on how they could fast-track baobab maturity and fruit production. According to harvesters, the trees of baobab are dying because of fire and they are blown off by wind as they are too old. This was verified during data collection because the only baobab trees observed were old with no re-generants. As reported by Julliard *et al.* (2006) producers of aromatic and medicinal plants in Madagascar are aware of the biodiversity issues but have limited knowledge and incentives to apply conservation practices at the ground level. This study therefore recommends that there is need for the Department of Forestry and research institutions in Malawi to promote domestication of baobab trees and shorten its precocity for sustainability of the trade.

Wholesalers of baobab products buy in bulk and transport them (Figure 7A and Appendix F) to semi-urban or city markets where they re-package in both small and big quantities (Appendix G), convenient to household processors, middle-men and final consumers. The products are sold in these different units so that it is convenient for anyone to buy depending on how much he/she has. De Caluwe (2011) reported about petty traders packaging baobab and tamarind products in small quantities convenient to consumers in Mali and Benin. It was also observed that wholesalers sell any type of fruits which are in season there-by having a flow of income all year round. With the flow of income, wholesalers are able to access loans from banks (Figure 4). This, therefore, makes the wholesalers to be able to meet high costs in their business such as for transportation, food and accommodation and overcome some challenges (Appendix H).

Wholesalers of baobab products in this study pointed out that the supply of baobab raw materials (fruits and pulp) only lasts for two months and this is not enough as the demand for the products is all year round. This makes the wholesalers to import baobab pulp from neighboring countries like Mozambique (Figure 4). One point to note is that despite wholesalers having a supply of baobab pulp all year round, they only rely on household processors and few individuals to buy from them and none of the company processors buy from them (Figure 4). The main reason brought forward by company processors was that wholesalers sell baobab pulp of poor quality (high moisture content and is darkish in colour) which spoils quality of the final processed products. This study established that the reason why wholesalers sell poor quality raw materials is that they buy them from any supplier (harvester in this case) provided they meet their demand and it is stored for months before the next season.

When pulp is stored for a long time its quality is lost, as a result the buying prices are lowered (De Caluwe, 2011). It was discovered that bags of baobab pulp were placed directly on the floor without any pallets underneath and the bags were stack on top of each other (Appendix I). This contributes to increase in temperatures and humidity as there is no circulation of air between the bags of pulp. Chadare (2010) detailed that browning of fruit pulp during storage increases with high temperatures and humidity and eventually leads to discoloration of baobab pulp. These conditions are not accepted on international standards and hence these products cannot compete on international markets. This explains why Tree Crops Limited in Lilongwe reported that it stopped buying baobab pulp from wholesalers (vendors) because of quality issues. There is need for harvesters to be trained in fruit handling and wholesalers should be placing baobab bags on a well raised platform with good aeration for it to maintain its good quality. Good quality raw materials will attract more company processors and produce final products of high quality which will be easy to compete on both local and international markets, therefore, increase actors gains.

Wholesalers store their goods anyhow (Appendix I) in city markets because there is a shortage of good storage facilities. The storage warehouse in Mchesi market in Lilongwe City was built by wholesalers themselves because they do not have anywhere to store their goods. It was revealed that one person can import over 100 big bags of baobab pulp at once from Mozambique. There is also lack of market information on quality control, which makes wholesalers to store their goods anyhow. For example, heaps of baobab pulp were seen displayed without any cover on top (Figure 7B) and this affects its colour. It is therefore recommended in this study that City Councils should construct storage facilities in city

markets for good storage of baobab raw materials and wholesalers should be trained in quality control measures, if they are to remain competitive in the market.

Despite having many baobab products processed in Malawi (Figure 9) only three (oil, powder, and soap) are exported. Baobab powder is exported to USA and UK while oil and soap are exported to Japan. This implies that few companies are competing on international markets and have the required international standards accepted. The reasons why only two companies are exporting their baobab products is that some processors do not have financial muscle to buy the recommended packaging materials for international markets which are not produced in Malawi but are imported from Kenya. For example, Japanese markets recommend oil packaging bottles which are black in colour (Appendix J) which reflect light and does not interfere with the oil. Abeyrathne & Jaenicke (2006) reported that the cost of packaging materials was one of the major challenges that small-scale processors are facing. Again Hishe *et al.* (2016) outlined that export oriented marketing is particularly demanding, requiring detailed information about specific markets, product specifications and standards which not all actors along the value chain can meet but comes with benefits. This explains why processors highlighted lack of information on international linkages and lack of capacity to meet the international standards as some of their challenges (Appendix H).

To increase export of baobab products, therefore, there is a need for baobab actors (processors) to be linked with Malawi Investment and Trade Centre (MITC) as its objective is to promote investment and exports in Malawi. This is possible because some of the MITC's strategies include investment forums and fostering business linkages for joint venture partnerships. Actors in baobab trade in Malawi should move to information,

technology, and communication by advertising their products on websites to be known to international buyers. Additionally, MBS should have differentiated inspection and certifying rates for small and large industries. One baobab group in Salima district pulled out of the business because of high rates offered by MBS for inspection of their premises for their business to be certified.

Additionally, “copy-cat business” between actors in baobab trade must stop and actors should be innovative enough to come up with new business ideas in formulating new products parallel to the ones already existing in the country. Furthermore, actors in baobab trade should collaborate with research institutions to share new knowledge generated through research rather than being afraid that people outside the business will steal their business ideas. This was one of the challenges for this study as actors in the trade were not willing to give out information freely as they were afraid the researcher wanted to steal their business ideas.

According to consumers, baobab products in Malawi are consumed daily and all year round. Buchmann *et al.* (2010) and Maranz *et al.* (2008) reported that baobab products in West Africa are available all year round and are consumed every day. Consumers purchase different processed baobab products from retailers or company processors. Despite many products processed in Malawi, not all consumers seemed to have an idea about other products like baobab soap, oil, jam and coffee. This shows that there is less advertisement and marketing of the processed products by companies in Malawi. This results in consumers not being aware of the benefits (health or nutritional) of such products, for example that baobab oil is an anti-ageing product. Sabbe *et al.* (2009) reported that in developed countries,

numerous tropical fruits and their derived products are quite unknown to many consumers and are likely to remain so, unless consumers' acceptance of these products followed by successful market introduction occurs. Food neophobia is expected to have a negative effect on the acceptance of functional foods (Sabbe *et al.*, 2009). Therefore, even if processors of baobab products keep on processing such products, there may be no ready market. There is a need for processors to conduct product awareness campaigns for consumers to know and buy their products, which will consequently translate into making more profits.

Spot market relationship was observed when consumers were not choosing a particular supplier for the baobab products they want to purchase. Consumers buy baobab products from retailers, processors, and wholesalers (Figure 4). If they do not find that type of a product from one actor or they do not agree with the price they go to another actor, do all the transactions and leave. For example this type of relationship was observed when consumers were buying both processed and unprocessed baobab products in both formal and informal markets. Spot market relationship was also observed between wholesalers and harvesters. Wholesalers buy baobab fruits or pulp from any harvester until they meet their demand. They do all the transactions including negotiation on price and quantity. Once they agree on the price wholesalers buy the product and the relationship ends there. It is also the same when wholesalers want to buy the whole tree of baobab fruits from the owners (Figure 4). They agree on the price and wholesalers cater for all the other costs to bring the fruits down the tree while the owners are seen doing other business in their homes. Spot market relationship was also observed between household processors buying the raw materials from harvesters and wholesalers.

In this type of relationship, one is not bound to have a choice to transact with anyone he/she wants. This relationship gives room for variety of sellers to choose from, provided the buyer is satisfied with the price, quality, and quantity of the product. Arm's length relationship was also reported between abaca farmers and traders in Philippines based on supply and demand (Daly *et al.*, 2016). Farmers switch to any buyer offering a better price. KIT & IIRR (2008), documented adhoc relationships existing between traders and farmers of tomato business in Ghana whereby there is no organization between the two actors and business is done the moment they see each other. According to KIT & IIRR (2008), adhoc relationships do not come with trust between actors and it encourages cheating on quality, quantity and even exaggerates prices because actors do not know each other well. Miller & Jones (2010); Shahidullar & Haque (2010) agree with KIT & IIRR (2008) that spot market relationship is prone to various risks in relation to price, quantity, quality and comes with dishonesty, as such value chain based on such cannot be sustainable. Furthermore, quality assurance, value adding, and innovation are low. Because of the above reasons, this study discourages such type of relationships between baobab actors.

Persistent network relationships exist between company processors and harvesters whereby company processors mentioned of having some harvesters who supply them with baobab pulp time and time again. Processors agree with harvesters how they want the raw materials to be handled or processed. The processors agree with the harvesters prior to harvesting season on the quantities to be bought, price and the period. When conditions which they agreed are met, the transactions are made. This type of relationship happens every year with a higher level of trust and interdependence. Through frequent communications actors develop

mutual understanding of the business which may result in more cooperation and lower risks (KIT & IIRR, 2008).

Persistent network relationship was observed between retailers and company processors. There is a contract of supply of baobab products between company processes and retailers. These actors agree on the quantities, mode of payment, price, and time of delivery. The contract can be signed or not, it all depends on how the actors agree (KIT & IIRR, 2008). Persistent market relationship was also observed between an oil company processor and a cooperative union. The company supplies the cooperative union with processed baobab products time and time again. It was discovered that Home Oil Company is in this type of relationship with Maluso Cooperative Union because there are few buyers buying products in bulk from them. The other reason is that Maluso Cooperative Union acts as an umbrella for all cooperative groups under One Village One Product (OVOP). In Abaca value chain a long-term relationship called “suki” system was also reported wherein a farmer regularly sells their produce to the same buyer, and where their relationships have been built in years without any contracts signed (Daly *et al.*, 2016).

Horizontal integration relationship exists between TreeCrops Limited and Zankhalango Association supplying the company with baobab pulp. The formation of this association was facilitated by Tree Crops Limited to be supplied with high quality raw materials. Tree Crops Limited has an agreement with traditional leaders for Zankhalango Association to be collecting baobab fruits from registered community forests in the communities. Tree Crops Limited has a system of premium payments called the access and benefit sharing mechanism. Collection of baobab fruits from these forests calls for a premium, which is paid to the

association. The premium is used by the association to implement social projects in the community such as repairing of water pumps and school roofs.

Horizontal integration relationship also exists between exporting companies (TreeCrops Limited and Maluso Cooperative Union) and their buyers in international markets (Figure 4). They have signed contracts on the standards of the baobab products to be followed, volumes, and price. These exporters mentioned that if one does not comply with the contract conditions the business deal may be terminated anytime. During data collection, it was revealed that in 2016 Tree Crops Limited companies did not follow the conditions when sending the baobab pulp as it had high moisture content than the recommended and this led to the buyer not to buy the product as usual. This had led to the company making loses as no any international as well as local buyer was willing to buy the baobab pulp. Baobab actors need to follow contract guidelines at all times for them to keep on transacting their businesses with their buyers and remain competitive in the trade.

Horizontal contractualization leads to better coordination among producers in aggregating products, maintaining quality standards, accessing inputs, and improving bargaining power (Riisgaard *et al.*, 2010). This type of relationship is encouraged by KIT & IIRR (2008) because both market institutions and chain relations are stronger thereby there is value addition, quality is improved, and risks are reduced. Horizontal integration improves the overall efficiency of the aromatic and medicinal plant value chain in Madagascar by allowing some economy of scale and increasing the competitiveness (Juliard *et al.*, 2006). Despite horizontal integration relationship coming with huge costs and long processes like the legal requirements, it should not scare actors of baobab trade, in fact it must assure them that both

parties will be abiding by those requirements and have a transparent business. Actors in baobab trade in Malawi need to get involved in horizontal integration relationships because not only does it increase market power, market share, and economies of scale, but also it reduces production costs as well as competition.

5.2 Distribution of benefits from baobab trade along the value chain

Despite harvesters having the highest gross margin than any other actor along the chain (Table 6), it should be noted that they are the ones receiving a small value share than the rest of the actors along the baobab value chain particularly for baobab fruit (Table 5) where wholesalers of baobab fruits are charging five times more than the harvesters. The reason behind harvesters getting the highest gross margin is because the only cost incurred by them is for packaging. Jensen (2009) reported that the only input of harvesters in agarwood value chain is labour and transportation costs and this indicates that harvesters have less expenditures than do any other groups of actors, and can make considerable returns.

In this study, the other cost incurred by harvesters was time for harvesting and selling baobab products, which is MK18, 278.00 (US\$ 23.4) after working for 152 hours per season (Gumma, 2011). The minimum wage for casual labourers per hour in Malawi for 2017 was MK120.25 (US\$0.15) (Mzuzu Labour Officer, personal comm.). The results (Table 6) mean that baobab harvesters are profiting from the baobab business although this money is just for a season per year (three months). This compares well with fruit collectors in Sudan who were able to earn US\$2.75 more gross profit for their effort in comparison with the average wage

rate of semi-skilled labor, although only for a maximum of four months per year, the length of the fruit season (Gumma, 2011). Similarly, Dounias (2004) found that the average annually income for edible palm weevil larvae harvesters was significantly higher than that obtained by unskilled workers in towns or by the producers of cocoa or coffee in the same country.

On the other hand, results by Vodouhe *et al.* (2009) show that collectors/gatherers have the lowest margins and wholesaler margins were found to be intermediate. The case is different with baobab harvesters having less profit as compared with wholesalers because they do not add much value to their products as a result; they sell at a low price. The other reason is that harvesters do not store their products unlike wholesalers who buy in bulk, store and release gradually. This means that wholesalers sell at a higher price when the products are scarce but the demand is still high. For rural communities (baobab harvesters in this case) to keep on circulating their income there is a need to be involved in trading different products which are available in different seasons and not only relying on a particular seasonal product like baobab.

The reasons for harvesters receiving a less value share (Table 5) along the chain is attributed to not only the fact that they sell products (fruit) without adding any value, attracting low prices, but also because due to poor road infrastructure, they do not have the capacity to access formal markets which fetch high prices. Similarly, KIT & IIRR (2008) reported that milk farmers in Kenya received a smallest value share (23%) as compared to other actors along the chain. Additionally, Te Velde *et al.* (2006) reported that exporters made 200% more profit than collectors of mushroom in Mexico. Agae *et al.* (2005) and Fafchamps &

Hill (2005) stated that most farmers in Sub Saharan Africa (SSA) are geographically isolated and thus often outside reach of formal market institutions. Although selling goods at farm gate appear to be less profitable, it may be the only alternative open to producers who cannot afford selling in formal markets. Harvesters thus accept receiving a lower price on the farm/homestead than receiving a higher price but incurring more costs.

If harvesters of baobab trade in Malawi are coordinated and work in groups or associations, they can increase their bargaining power, have access to training and equipment, and increase their value share. Although on the other hand, when people are working in groups, there is lack of “burden sharing” and there is no sustainability of the group once the helping hand (companies in this case) leave. This is one of the challenges raised by members of one baobab group; that they are failing to maintain the machines which were given to them to start the business as people were just sharing the profits and avoiding the running costs. Self-empowerment should be encouraged within baobab actors for the sustainability of the business.

For those tree owners who are unable to climb the baobab trees and have no money to pay a skilled harvester and transport, their preference is to sale the whole tree of baobab fruits at a very low price of K3000(US\$3.8). This contributes to harvesters earning a low value share (Table 5). This study therefore recommends that the Government of Malawi introduces a minimum support price for buying the whole tree of baobab fruits just the way the Government of Uttarakhand introduced a minimum support price to growers of Malta oranges in 1999 to guarantee farmers’ income (Choudhary *et al.*, 2015) with a government

agency designated to facilitate marketing and purchase of Malta oranges from farmers at this price (Choudhary *et al.*, 2013).

Additionally, another cause of low value share for harvesters is that harvesters are compelled to sell baobab raw materials at low prices mainly because of the low quality resulting from a lack of knowledge about quality parameters. Shinwari & Qaiser (2011) documented that collectors in the value chain of medicinal plants typically receive only a small share of the final value, either because they are unaware of the real value or are unable to market it in the form wanted by buyers. Again FAO (2005) concluded that the reason why producers receive a low value share is because they are unable to market their products directly to buyers. Litvinoff & Madeley (2007) found that farmers or gatherers only obtained a minimal share in the benefits of NTFPs as compared to intermediaries, wholesalers, and retailers because they sell their products in informal markets with low prices. Subedi (2006) recommended that training for paper producers on paper production and quality management and linking those to formal markets has the potential to enhance producer economic status. It is therefore, important for the actors of baobab trade in Malawi to consider quality of baobab products to be on their priority list for the products to be sold at a higher price.

Comparing association harvesters and individual harvesters, there is a slight difference in their gross margins (Table 6). Association harvesters are gaining more than the others because they sell baobab pulp only and not fruits. This pulp is processed from fruit and their price per Kg is MK300 (US\$0.4) than for individual harvesters MK154 (US\$0.2). The price used by association harvesters is agreed upon prior to harvesting season because of the trust which comes with the horizontal integration relationship between the association and the

buyer. Rota & Sperandini (2010) in a study of livestock value chain also reported about producers receiving the smallest value share in the business simply because they depend upon using traditional marketing channels with adhoc relationships rather than coordinated links among other actors which fetches higher prices as they come with high bargaining power and trust. This is why this study is recommending that actors in baobab trade (especially harvesters) need to be coordinated to increase their bargaining power.

The opportunity for smallholder farmers to raise their incomes depends on their ability to compete in the markets (Markelova *et al.*, 2009; Hazell, 2005). This is constrained by high transaction costs and coordination problems along the production-to consumption value chain (Shiferaw *et al.*, 2008). Smallholder farmers can reduce transaction costs, obtain necessary market information, secure access to new technologies and options, and improve market access by acting collectively (Kruijssen *et al.*, 2009; Markelova *et al.*, 2009). Collective action is the key to overcoming the shortcomings of unreliable and low production and enhancing producers' negotiating power in the value chain (Wymann von Dach *et al.*, 2013). In order to increase gross margin and value share for harvester, the study recommends that harvesters should operate as associations and not as individuals and that they focus on selling value added products (pulp in this case) rather than fruits. Working in an association has the advantage of increasing bargaining power, helps in accessing better markets through cost sharing, and enables primary processing (pulp production), and quality improvements.

Processors and exporters of baobab products are receiving high value shares and gross margins as compared to retailers (Table 5). When exporters are compared with processors, exporters seem to have high value shares. For example, exporters of baobab oil are charging

four times more than processors while those exporting soap are charging seven times more than processors (Table 5). The reasons why exporters and processors are having higher gross margins and value shares as compared to retailers is because they add much value to their products which are sold in standardized (formal) markets which come with higher prices. The other reason is that they have access to processing equipment, capital and market information. It was observed that processors and exporters have knowledge required to meet quality standards and market related information through their involvement in the horizontal integration relationships.

Furthermore, these two actors (processors and exporters) incur high investment costs such as high transportation costs, wages for workers, packaging materials, and for stock purchase. All these investments are incurred to produce high valued products and meet the market demand. For example the juice company carters for transportation cost in delivering juice to all distributors' countrywide so that they meet their national demand. For the powder export company, it has stationed some workers right in the villages to be training their baobab pulp suppliers (association harvesters) on fruit handling so that they buy raw material of high quality. For the oil exporter, they purchase the packaging bottles from Kenya so that they meet the international standards and sell at that higher price of MK6000 (US\$8) per bottle and have higher returns at the end.

Contributing to the higher value shares of exporters and processors is the relationships the actors are in. There exist horizontal integration relationship between exporters and their international buyers, and persistent relationships between processors and their buyers. Ponte (2008) highlighted that there is need for actors to upgrade by acquiring capabilities and

accessing new market segments through participation in horizontal type of relationships which leads to better coordination among actors. Riisgaard *et al.* (2010) added that relationships do not only improve bargaining power but also maintain quality standards. This study therefore recommends that to improve marketing of baobab products in Malawi horizontal integration relationships and persistent relationships between actors should be encouraged.

Looking at gross margins within exporters, the cooperative union's gross margin is higher than for the powder exporting company simply because the cooperative union buys already made products and just adds value to them, and shipping cost is handled by the international buyer. The case is different with the powder exporting company where by all the costs from fruit handling to export are met by the company, hence incurring high cost.

Retailers have small gross income (Table 6) and a small value share in five of the seven products they sell (Table 5) because they invest less in such a way that the only cost incurred by them is for stock purchase as the goods are brought to their shops by the suppliers (processing companies). Similar results were reported by KIT & IIRR (2008) that retailers of tomato business in Ghana have a lowest share (17%) than all other actors involved in the trade because they sell final products which do not need more value addition. Retailers having a higher share in the remaining two products (Table 5) are those which are souvenir shops that target mainly tourists as their prices are higher.

Comparing different baobab wholesalers, the results (Table 6) show that those buying pulp from Mozambique are making high gross incomes than the rest simply because their

investments are also high. These wholesalers buy baobab pulp in bulk (one can buy more than 100 big bags at once) and this makes them benefit from economies of scale thus increasing their gross income. For wholesalers buying fruits in bags, have low gross margin than the other wholesalers simply because they spend much on purchase stock and yet when they are selling in the city markets they sell raw fruits and the only value addition on it is grading. According to wholesalers selling baobab fruits, they sell raw fruits because it is labour demanding and time consuming to smash the fruits into pulp (value addition).

Those wholesalers buying baobab fruits as a whole tree seem to be having a higher gross margin because their cost for purchasing stock is very low. This practice is not encouraged in this study because it has been observed that it exploits the tree owners (harvesters). With this practice, therefore, this study confirms an exploitative role of middlemen as suggested by Te Velde *et al.* (2006). Marshall *et al.* (2003) documented that in general, traders (wholesalers in this case) are reported to have higher margins than smallholders (harvesters). Chakma (2011) also reported that intermediaries of bamboo mats value chain in Laos earn more than the villagers because they also invest more. For the above reasons, therefore, a key objective is to ensure that baobab harvesters have better access to the skills and capacity to add value to their products and are organized to take advantage of transparent and competitive markets as described by Rota & Sprendini (2010). Expanding the capacity for baobab production and its marketing outlets is a potential catalyst for improved trade.

5.3 Institutional arrangements and institutions of baobab trade

5.3.1 International level

According to Welford & Breton (2008) the aim of FLO is to enable the sustainable development and empowerment of disadvantaged producers in the developing countries through setting international fair-trade standards, facilitating and developing fair-trade. Fair-trade movement is to offer a better deal for farmers by paying above the market rate for the commodity in question and in return the farmers are expected to adhere to the fair-trade policies on production and follow quality-driven requirements, particularly in the cultivation and collection stages (Booker *et al.*, 2012). Although basically this is to be welcomed, the scheme is far from reality as it only represents a small section of the total market and may be more suitable in some countries than others (Farnworth & Goodman, 2008). As documented by Booker *et al.* (2012) schemes such as fair-trade, although not perfect, have shown that it is possible to develop a better working relationship with farmers and that profits can be distributed more fairly along the value chain.

As reported by Gruenward & Galizia (2005) there is no Specific Harmonized Commodity Description System (HS- Code) for baobab fruit pulp for the EU market. The standards are based on accepted raw supply practices for industries such as out-sourced production for paprika products (Gruenward & Galizia, 2005). In 2005, PhytoTrade Africa partnered with the World Conservation Union, called the Natural Futures Programme, with certification as one of the focal topics of collaboration (PhytoTrade Africa, 2008). It was immediately apparent that there was no single certification scheme that met all the criteria for PhytoTrade Africa (Welford & Breton, 2008). In 2006, PhytoTrade Africa decided to support the

development of the Ethical Bio-Trade verification framework (Union for Ethical BioTrade, 2007) with the aim of conserving and sustainable use of biodiversity, fair and equitable sharing of benefits, socio-economic sustainability, compliance with national and international legislation, and respect for the rights of actors involved in Bio-Trade activities.

In the current absence of internationally recognised fair-trade standards for baobab, PhytoTrade Africa implements its own rigorous fair trade and sustainability charter (PhytoTrade Africa, 2008). PhytoTrade Africa is a member of International Fair-Trade Association (IFTA), whose members have signed an environmental and fair-trade charter, in which they have agreed to ensure harvesting methods that minimise adverse environmental impacts, domestication and cultivation and on site management where appropriate. PhytoTrade Africa uses Pre-Qualified Supplier (PQS) system for quality control whereby members are assessed to ensure they can supply the correct volumes and quality to the selected market and training is given to rural harvesters (PhytoTrade Africa, 2008). They have internal control systems capable of meeting requirements of organic certification comprising of supply groups with coordinators or chairs acting as contact and control points (Welford & Breton, 2008). Material is traceable from storage warehouse back to individual harvesters through practices such as supplying numbered food-grade plastic bags and other audit trail methodologies common in food and pharmaceutical raw material supply chains. All processing steps must accommodate traceability requirements through batch numbers for each production run and only food grade packing materials are approved for use (PhytoTrade Africa, 2008).

Organic certification was attained by three PhytoTrade Africa key producers (one from Malawi) between 2005 and 2007 through EcoCert-Afrisco and it was denied for one member of the trade as their baobab products were not purely organic (PhytoTrade Africa, 2008; Welford & Breton, 2008). While EcoCert-Afrisco is approved to provide certification for both EU and USA market organic standards, the lack of competitiveness in this support service reduces accessibility for NTFPs (Hishe *et al.*, 2016). Currently, importers of various wild products to European markets acquire multiple certifications such as for sustainable harvesting, bioorganic certified and fair trade standards provided by EcoCert-Afrisco (Wynberget *et al.*, 2015). According to PhytoTrade Africa (2008) baobab trees are organic because they have been grown in the wild for many hundreds of years, although they are not certified organic by default. The certification of the baobab raw material as organic and/or fair-trade could be an important added value feature (Gruenward & Galizia, 2005). As reported by (Welford & Breton, 2008) the production process of baobab products is more environmentally friendly.

PhytoTrade Africa (2008) highlights that market access has not really been different for organic or conventional products. Organic certification is the only standard of immediate applicability to members of PhytoTrade Africa although it is expensive, logistically challenging, and largely irrelevant to the needs of its membership (Welford & Breton, 2008). Juliard *et al.* (2006) agrees with Welford & Breton (2008) that organic certification is presently the most widely used protocol although it is complex and expensive, but is compensated by price premiums and positive environmental impact. Faccer & Stephens (2006) highlight that increasing demand for certified NTFPs in global markets fails to acknowledge the inherent difficulties faced by the rural African producers in attaining the

standards required for certification and acts as a barrier to trade. Additionally, Lewis *et al.* (2006) highlight the rigorous requirements for complex internal control systems that may not be appropriate to small scale producers. Globalization is exposing actors in the value chain to new and unfamiliar conditions. While some actors may be in a position to take advantage of the changes, many more, particularly in the developing world, are facing increased vulnerability (Leichenko & O'Brien, 2002). Despite the disadvantages of certificate, if actors of baobab need to compete especially on international markets, they need to certify their products.

According to PhytoTrade Africa (2008) the company (PhytoTrade Africa) has hygiene standards such as Good Manufacturing Practice (GMP) and sanitary and processing requirement like the HACCP, governing product entry into the EU. Kaplinsky *et al.* (2011) also documented that cassava pellets exports to the EU from China are required to satisfy GMP and HACCP standards certification. GMP is a general standard required for processed products across sectors, whereas HACCP is the public food safety standard specifically designed to prevent known hazards from entering the critical points of food processing and production (Nadvi & Waltring, 2004). As a member of WHO, Madagascar is asked to respect the directive on GMP for medicinal plants (Juliard *et al.*, 2006).

PhytoTrade Africa (2008) believes that baobab trees in the Southern region face no significant sustainability issues in the short to medium term even with a rapid and substantial increase in global demand. Even though PhytoTrade Africa reported about this, already the findings of this study are showing that the supply of fruits from baobab trees in Malawi is not

adequate to satisfy the huge demand of baobab products for both raw fruit for consumers as well as for processors (household and company) and exporters. Baobab fruits only last for three months in Malawi and this is forcing wholesalers to import baobab raw material (pulp) from Mozambique. The baobab business is at risk because processors of baobab products are removing seed from its favorable climatic conditions to cities with different climatic conditions where the seed cannot germinate.

Additionally, it was observed during data collection that some baobab trees were cut in the villages without being replanted. Further to that, one of the major challenges outlined by harvesters was that some harvesters (especially those that cannot climb the trees) damage the branches of the trees when harvesting the fruits. Akinnifesi *et al.* (2006) reported that there has never been any domestication or cultivation programs of baobab trees in Malawi despite it being the key producer of baobab pulp in Southern Africa (PhytoTrade Africa, 2008). This means that if harvesters are not using good harvesting practices the number of trees per unit area may decrease and eventually reduce productivity per year and this may affect sustainability of its trade.

On the other hand, Chirwa *et al.* (2006) carried out an inventory on trees of baobab in Malawi. Unfortunately the inventory did not zero in on the actual production of the trees and, to make the situation worse, it reported that baobab are both male and female trees. So far in the population, the density of female trees that produce fruits and supply the commercial industry is not known and this information is fundamental in gauging the sustainable supply of the trees in Malawi.

It is reported that PhytoTrade Africa's producers, adhere to best practice standards that include ongoing monitoring and regeneration of wild baobab populations (PhytoTrade Africa, 2008). PhytoTrade Africa signed the environmental and fair-trade charter in which they have agreed to ensure domestication and cultivation of the products (Gruenward & Galizia, 2005). The case is different with Baobab Fruit Company (in Italy) which is also a member of the IFTA whereby it had a project to cultivate 4000 baobab trees (Gruenward & Galizia, 2005). This study therefore recommends that, since Malawi is the key producer of baobab pulp in the Southern region, there is need for domestication programs of the baobab trees for sustainable productivity and trade.

5.3.2 National level

The MGDS II recognises the economic importance of the environmental and natural resources as income sources, particularly forest products (GoM, 2011). With respect to the contribution of the environmental and natural resources, unsustainable natural resource use for Malawi amounted/contributed to about five percent of GDP in 2010 (GoM, 2011). While this approach represents a shift in the role of recognition of environmental and natural resources to human welfare, it still falls short of discussing the number of households whose productivity and food security have improved as an outcome of the environmental and natural resources investments.

The key priority area on trade highlights that tobacco is currently dominating the export market despite facing problems due to anti-smoking lobby (GoM, 2011). It is therefore important for the country to diversify its export base away from tobacco and look at other

products which have potential, like baobab. The Government of Malawi continues prioritising agro-processing focussing on sugar, tea, cotton, coffee, honey, cassava, soy beans and many more (GoM, 2011). The goal on industrial development is to develop and expand the industrial sector with emphasis on value addition and employment areas with one of the key strategies focussing on promoting value addition in existing and potential products (GoM, 2011). The current study argues that baobab products can help in achieving this goal based on the following facts; after the authorization of baobab fruit pulp as a novel food by the European Union in 2008 (EU, 2008), thousands of tons of baobab products are being exported to European countries hence bringing foreign currency to the producing countries (De Caluwe, 2011). Baobab is regarded as the highest earner of all NTFPs in the Southern region (Wynberg *et al.*, 2015) and projections suggest annual incomes of up to US\$ 1 billion for producer countries (RTFP, 2007). The main exporter of baobab pulp to Europe is PhytoTrade Africa, whose key producer is Tree Crops Limited of Malawi (PhytoTrade Africa, 2008). With these facts, baobab trade has shown to be a viable business in Malawi.

If the Government of Malawi wishes baobab to play its full role in developing the agribusiness sector in Malawi then there is a need to begin discussing a clear strategy with measurable outputs and detailed milestones with timelines through the Ministry of Natural Resources, Energy and Mining. There is need for the Government of Malawi to formalize baobab trade and start considering baobab as a tree with economic potential, through an increased supply of baobab value addition technologies and developing baobab standards for both domestic and international markets. The contribution of indigenous fruit trees to many farmers' livelihoods is often not acknowledged in neither national nor international level poverty reduction strategies (Schreckenber *et al.*, 2006). Ndoye & Awono (2010) reported

that due to a lack of official recognition and national regulations or policies, the inclusion of underutilized species in national programmes in developing countries is limited.

According to (GoM, 2004) the National Environmental Policy seeks to mainstream various environmental and natural resources management principles and practices into various sectors of the economy. The policy recognizes that poverty is one of the root causes of environmental degradation in Malawi and that its alleviation is critical to natural resource conservation, protection, and sustainable utilization. Therefore, it proposes multi sector strategic actions for improved and sustainable environmental and natural resource management. This includes conservation and sustainable use and management of biodiversity (GoM, 2004). There is a need for the Government of Malawi to consider conservation and domestication programs for potential trees such as baobab as there has never been any conservation and domestication for this multi-million dollar tree in Malawi, despite it being ranked as one of the important trees by communities (Akinnifesi *et al.*, 2006).

The National Forest Policy (GoM, 2016) has also lamented inadequate forest law enforcement and inadequate knowledge and understanding of good forest practice as problems which the policy would like to address. This entails that even the Government of Malawi is aware of inadequate forest law enforcement and knowledge by the end users. In Malawi's National Forestry Programme, one of the strategies is to support community based forest management through empowering groups at community level to collaborate with government and others in managing forests, developing forest based enterprise and carrying out good management of forest resources on customary land (GoM, 2000). Schreckenber *et al.* (2006) reported that in Bolivia, as in many other countries, there is very little policy or

legislation specific to NTFPs. Similarly, Russell & Franzel (2004) identified lack of adequate policies regarding harvesting of NTFPs in Africa as one of the market constraints. Moreover, indigenous fruit trees have not been subjected to agricultural or forest policies (Akinnifesi *et al.*, 2002). Nevertheless, communities are often obliged to remain in the informal sector because they lack the capacity to fulfill the legal requirements for formal-sector NTFP commercialization.

According to GoM (2004) the forest policy has some overly ambitious strategies including committing government to review the national forest policy biennially and ensure that any updating of the policy should be done in harmony with other related policy issues. Further, it promises to introduce price incentives to promote investments in forest industries. Apparently, most of such overly ambitious goals have not been achieved, as evidenced by the fact that, so far, no clear price incentives have been introduced to promote investment in the forest sector (GoM, 2004). Although policy and regulatory frameworks promote the sustainable use of environmental and natural resources, government institutions such as MGDS II have cited limited financial and human capacity as the major reasons for failure to implement policies and laws.

The Ministry of Industry and Trade officially launched OVOP programme which had a strategic plan for 2014-2019 and was in tandem with the MGDS II. The aim of the programme was to develop goods and services through value addition by communities using locally available resources. OVOP program facilitated the formation of cooperative groups and a cooperative union in Malawi. This study has revealed that these cooperatives are benefitting from loans or grants in the form of equipment and training in value addition to

different products made from locally available resources like baobab, moringa, palm, honey, among others. Accessibility of loans or grants in either cash or equipment to processors is an opportunity for value addition whereby processors produce a variety of quality baobab products on the market. It is acknowledged that collective action plays an essential role in creating market access for smallholders (Jaenicke, 2010; Will, 2008) as it increases the bargaining power and economies of scale of small-scale producers and processors (Marshall *et al.*, 2006).

MBS is a statutory organization under the Ministry of Industry and Trade which does a direct inspection to assess quality of products in Malawi. This is where the body assesses if processors are abiding by quality standards. Upon being satisfied, the body produces a certificate for the company to continue processing their products and sale their products in big retail shops. Standards help to make trade more efficient, more remunerative and more client-oriented (KIT & IIRR, 2008). Similarly, Gibbon & Ponte (2005) reported that standards are important as they determine access to specific segments of markets. With poor quality standards, there is no way the baobab products can find their way into the big retail shops and international markets as they cannot compete with other products even if the trade is formalized.

In Madagascar, Juliard *et al.* (2006) documented about Ministry of Industry and Commerce and Support to the Private Sector in defining and establishing norms, grades, and standards for consumer products. The results of this research indicate that despite the advantages that come with standards, not many processors in Malawi go through this process as they think it expensive and time consuming. According to MBS officials the processes takes long because

the qualifying body does not have its own laboratory for some of the tests and it relies on research institutions or universities for the analyses. There is a need for the Government of Malawi to support MBS in constructing their own laboratories and human resource to fast track the processes rather than relying on other bodies.

On top of certifying the products, the research institutions offer phytosanitary certificates (Appendix K) for the baobab products exported to international markets at a fee. KIT & IIRR, (2008) documented that certification improves the credibility of the standard, but it entails higher costs for the applicant. Faccer & Stephens (2006) highlighted that increasing demand for certified NTFPs in global markets acts as a barrier to trade for African producers. Additionally, Rota & Sperandini (2010) reported that achieving and maintaining the critical standardization and quality requirements of the major markets represent a significant constraint for the rural poor. KIT & IIRR (2008) further documented that quality grades help trade to become more efficient, reduce handling costs, stimulate long-distance trade, and improve business returns and client satisfaction because quality is rewarded with higher prices.

5.3.3 District level

There is a cooperative union in Lilongwe which was facilitated by OVOP programme under the Ministry of Industry and Trade with the aim of promoting value adding technologies, facilitating product quality control, packaging and promoting market linkages between producing communities and domestic/ international markets. The union follows 5S theory

which stands for Sorting, Set equipment, Shine products, Standardize and Sustain the other entire four S'. It buys final products from the cooperative groups across the country, adds value to the baobab products through packaging and adding fragrance and sells in both local and international markets while maintaining the source (name of the processor) when packaging. It was also observed that the cooperative union can use the same final products and make other high valued products like lip balm which is sold mainly in souvenir shops.

The reasons why the cooperative union is able to meet the international standards which the cooperative groups are failing to meet is because it sells different products rather than just from baobab collected from different cooperative groups all-round the country and that it is directly linked with the Ministry of Industry and Trade. The Ministry has been in reciprocal exchange programs with people from Japan through the OVOP program. With the rapport between the Ministry and the Government of Japan, this is why the cooperative union sales its products to Japan. This implies that the cooperative union benefits from the information flow between Malawi and Japan on the baobab and many products' demand, quality, quantity, and price. This information flow could be at their fingertips because they are organized and this accords them the experience with market negotiations.

Market information is one of the major areas in developing of NTFPs commercialization (Neumann & Hirsch, 2000). Hellin *et al.* (2005) confirmed that smallholders have access to market information if they are organized and work collectively, which gives them market negotiation skills. Despite the advantages that come with working in groups, this study does not support the establishment of such cooperative unions who act as brokers. Actors in baobab trade need to be directly linked to the buyers for them to have a highest value share in

the trade. Barton *et al.* (2011) argue that the disadvantage of cooperatives is that they need to be profitable in order to finance much-needed assets and maintain a strong balance sheet.

One of the cooperative groups under OVOP processes baobab products and comprises 25 members (28% males and 72% females). Each member purchases individual shares at K10,000 (US\$13) each and one can choose to buy more than one share. This cooperative group also produces different types of products (soya, sunflower, ground nuts, and moringa) and sells them to a cooperative union in Lilongwe or direct to final consumers. All the positions in the group starting with the chairperson, vice chairperson, secretary, treasurer and group members are voted for, annually.

Profits from the sales of the products are shared at the end of the year according to the shares bought. The major challenge mentioned by the cooperative group was lack of capacity to meet the international standards, like packaging materials which are expensive (Appendix H). The group outlined that they were given both the pre-permit and permit certificates of approval to manufacture/sell/distribute products covered by Mandatory Malawi Standards (MS 334: Skin care products and MS 722: Labeling, presentation of pre-packed goods for ultimate consumer) and advertising in accordance with the requirements of section 27 (3) of the MBS Act.

According to one of the chairpersons of the groups, there are no specific standards for baobab products by MBS. Similarly, CYE Consult (2009) reported about MBS lack of standards for cassava and maize starch for textile industry and for edible cassava flour to reach international criteria. Furthermore, CYE Consult (2009) reported that there are no standards

established for selling fresh cassava roots in urban markets and therefore choice and price is left up to the consumer to agree upon with the trader. Baobab oil processed at this factory was tested in Japan for human consumption in 2015 and was found to be fit (Appendix L).

It was surprising to note that the cooperative groups mentioned of not having any direct links to the international markets and that they have to sell their products to the cooperative union first and that is when the cooperative union sells to international markets. It is suspected that either the cooperative union is hiding some market information from the cooperative groups and acts as a broker or that some members of the cooperative groups do not understand their relationship objectives with the union. This could be the case because one of the previous members of the union highlighted lack of market information, especially on international markets, as one of the reasons they pulled out. Rota & Sperandini (2010) recommends that direct communication between end buyers and producers can be a powerful tool in helping producers to understand the implications of competitiveness.

Market literacy is lacking at the level of smallholders in Sub Saharan Africa as reported by KIT & IIRR (2008). Market information together with the ability to use that information, are thus important prerequisites for entering new markets and maintaining market shares (Marshall *et al.*, 2006). Incomplete or non-transparent market information leads to what is called market failure (KIT & IIRR, 2008). KIT & IIRR (2008) added that it is one thing to have market information, but that it is a different thing to be able to actually use that information. The particular challenge, however, is to develop information that can be effective in countries with high levels of illiteracy (Azami, 2002) to avoid misunderstandings. This study therefore recommends that to achieve one of the objectives by

OVOP (to promote market linkages between producing communities and domestic/international markets), there is a need for the program to help the producers in meeting standards and selling their products directly in both local and international markets rather than using the cooperative union while maintaining the producers names.

5.3.4 Local level

During one of the stakeholders' meeting when disseminating the current research findings, district forest officers pointed out that the Department of Forestry only protects and manages forest reserves while trees falling on customary land are under the control and management of local or traditional leaders together with extension workers and the community members. This was verified in the forest policy (GoM, 2016) that traditional leaders mobilize communities to participate in forestry programmes, develop and enforce forestry community by-laws, and implement forestry activities. This study has revealed that there has been a breakdown of community by-laws regarding use of common property resources (open access baobab trees).

It was revealed that there is no sense of ownership for community trees and access rights are free. This fear is forcing harvesters to harvest green and immature fruits which are later dried behind their backyards. The case is different with individually claimed trees whereby there is ownership of the trees and for one to access the fruits, there is a need to ask for permission from the 'owners' of the trees. Most countries have few or no regulations which control the collection of material from the wild; India, Bulgaria, and Nepal are notable exceptions (Hishe

et al., 2016). There has been mismanagement of common forest resources in some parts of Nepal because of weak or no regulations (Bhattarai *et al.*, 2003).

The case is different in Mwanza district where it was discovered during reconnaissance survey that there are strict by-laws on who have access to the community trees and time to harvest baobab fruits. The traditional leader in that area has developed and enforced by-laws and this has led to harvesters harvesting fruits which are well dried and mature. Probably due to by-law enforcement, there is a high traffic of wholesalers from the cities going to buy the quality raw materials (fruits and pulp) and this shows the importance of regulating the harvesting of baobab fruits which should be emulated countrywide. This study, therefore, encourages development and enforcement of by-laws by traditional leaders for communal trees and it also encourages individual rather than communal ownership.

Wholesalers from cities have market committees in their markets. These committees are available in both cities of Lilongwe (Mchesi market) and Blantyre (Blantyre market). In Lilongwe the market committee only comprises baobab vendors while in Blantyre it is a committee for all vendors selling different kinds of fruits. The market committee in cities vote for positions of the chairperson, vice chairperson, secretary, vice secretary, treasurer, and members annually. This committee facilitates social welfare issues of vendors at the market and each member thus pays a monthly contribution of K500 (US\$0.6). The market committees help the wholesalers to work in groups and share other costs. For instance, it was revealed that when wholesalers are purchasing goods they hire a single truck, negotiate for price and share the cost equally no matter how much ones' quantity is. KIT & IIRR (2008)

reported that cooperation in sharing transportation costs to bring goods to the market gives small-scale traders access to helpful economies of scale. It was discovered that transporters only charge a lump-sum amount and it does not matter if the truck is full or not. Wholesalers mentioned of high transportation costs as one of their challenges (Appendix H). Wholesalers should continue working in groups so as to continue sharing costs and continue being in the trade.

For those wholesalers sourcing baobab pulp from Mozambique, they are required to purchase an import document which they use in Mozambique and which becomes invalid once they cross the borders to Malawi. Although there is no fixed amount for this document, (as it ranges from MK25000 (US\$32) to MK40000 (US\$51) according to the wholesalers) it is compulsory for them to have it, failing which one cannot transfer goods within Mozambique. The case is different with wholesalers purchasing baobab raw materials locally (in Malawi) whereby they do not pay any form of tax in moving the products from one district to the other. Juliard *et al.* (2006) reported that when aromatic and medicinal plants are transported from one region to the other along the main roads in Madagascar, administrative entities have the authority to levy tax on transported goods established by the Ministry of Finance.

Again Wynberg *et al.* (2015) reported that in Zimbabwe the council collects harvesting and marketing levies of US\$10 for baobab products and imposes fines on members who are not fully paid up. Harvesters pay movement fees to the Forestry Commission to transfer material to the markets on top of the US\$20 which harvesters pay to the commission to be issued with harvesting permits. Hishe *et al.* (2016) urged that enabling communal governments to collect taxes could provide incentive and ability for them to monitor resource use and that revenue

could be reinvested in natural resource management. This study therefore encourages the Government of Malawi to formalize the trade of baobab products in Malawi so as to start collecting tax on moving the raw materials locally, which will contribute to the development of the country.

The registered association of baobab harvesters in Mangochi and Dedza districts currently consist of ten clubs. The formation of this association was facilitated by an export company (buyer) in Lilongwe to be supplied with quality baobab raw material (pulp). The association has positions in each club comprising chairperson, vice chairperson, secretary, vice secretary, treasurer, committee members and an in-taker. All these positions are voted for annually by members of different clubs. For one to be voted for a position, they look at honesty, time management skills and commitment. The contract was signed that the buyer will be providing the association members all the relevant trainings on fruit handling and marketing and input in the form of loans, transport, storage/warehouse facilities and finally buys the product from them at the agreed price. The overall role of the committee is to ensure that all members are abiding by the club rules (Appendix M) stated in the contract emphasizing on the collection of baobab fruits from the natural forests only which are not contaminated with chemicals following PhytoTrade Africa organic standards. The role of the in-taker is to be the middle person when the association and the buyer are discussing about the buying price to be used.

The study also found that members of the association get credit/loans from their buyer before they start harvesting the fruits and this is deducted from their products once sold. The formation of community-based organisations, where-by smallholders can pool resources and

market their products collectively, could overcome the high transaction costs resulting from their small size (Kruijssen *et al.*, 2009). Moreover, it can improve their access to resources (such as credit, transport, and training) increase bargaining power, and facilitate certification and labeling (Bienabe & Sautier, 2005). According to members of the association, although this capital helps them in times of need, they feel it forces them to sell their products to the company and not anyone else who may offer them a higher price. The aim of the buyer is to make sure that the fruits which are collected are not sold to anybody and the credit acts like a bond between the harvesters and the buyer. Neumann & Hirsh (2000) reported that there is a striking note in the practice of intermediaries putting demand with the collectors before NTFPs collection and advancing payment in form of credits. This has been observed to tie the collectors to the traders through debt or patron–client type of relationship (Neumann & Hirsch, 2000). As already alluded to in this study, it is still encouraging actors of baobab trade to work in associations or groups because of the benefits which come with them.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Recently, *Adansonia digitata* L. (baobab) fruit pulp has been approved for sale in the EU and USA, and has thus entered the formal international food market, offering opportunities for income generation for African farmers. The study was carried out to identify actors involved in the baobab trade in Malawi and map their relationships, evaluate the distribution of benefits among economic actors from baobab trade along the value chain, and examine the institutional arrangements and institutions that govern baobab trade at international, national, district and local levels.

Six categories of actors in baobab trade were identified in this study namely; harvesters, wholesalers, processors, retailers, consumers, and exporters. Three types of relationships exist amongst actors of baobab trade namely, spot market relationship, persistent network relationship and horizontal integration relationship. This study has found that the most common type of relationships of baobab actors in Malawi is the spot market relation which is not efficient and effective as it comes with little or no trust amongst actors.

The study has also established that there are significant differences in the sharing of benefits amongst baobab actors in Malawi. Actors who incur high variable costs like processors, accrue higher revenues as they sell many value added products at a higher price in chain

stores and international markets. For those baobab actors selling low valued products in informal markets they also accrue low revenues. Despite actors of baobab products selling both low and high valued products, this study has revealed that actors (processors) are not innovative enough to find other uses of by-products leading to less maximisation of profits. This study also found that consumers of baobab products are not aware of the many products of baobab produced in Malawi. This therefore, also leads to low revenue generated by actors as the goods are not sold on time.

Amongst the regulatory bodies at an international level fall the ISO, Eco-cert, and FLO, setting voluntary quality control systems, providing quality standards and reviewing organic standards for wild harvested products sold in international markets. The current study has found that processes of quality standards and certification of baobab products adds value to the products although they seem to be time consuming and expensive. This therefore, only favours those actors who are already established in the industry. Fruit handling technique of baobab products is lacking amongst baobab actors in Malawi which lead to poor quality of baobab final products. Though MBS certifies baobab products for formal markets, it does not have their own laboratories and enough human resource. This contributes to delay in the certification process and affects the baobab actors. This study has concluded that there is lack of information especially on the international buyers between OVOP under Ministry of Industry and Trade and its cooperative groups which makes the actors to rely mainly on local buyers for their products.

Currently, there are no domestication programs of baobab in Malawi despite it being one of the species preferred by consumers. There are also weak by-laws by traditional leaders on

when and how to harvest baobab fruits and this affects the quality of final baobab products and the future of baobab trade.

6.2 Limitations of the study

1. The researcher failed to capture fixed costs during data collection because some actors do not keep records or the equipment used was either received as grant or loan and did not know its value.
2. Some actors were not willing to be interviewed or to give some of the information thinking the researcher wants to steal their business design.
3. Many of the baobab actors do not keep records of their business and it was hard to capture past price trends of baobab products.

6.3 Recommendations

From the results and the discussion of this study it is recommended that:

Actors in baobab trade in Malawi need to get involved in horizontal integration relationship because not only does it increase market power, market share, and economies of scale, but also it reduces production costs as well as competition. In horizontal integration relationship there is value addition, quality is improved, and risks are minimized.

Actors of baobab trade in Malawi need to be selling their value added products in formal markets which attract higher prices and, eventually, higher revenues. Actors of baobab trade need to diversify on products by being innovative and utilizing waste products. As a continuation of the current study, academician should conduct research on economic uses of baobab by-products, like sludge, for the actors to maximize benefits. Again, further research should concentrate on the apportioning of the value going to each actor for a specific product and also look at market concentration ratios. In addition, actors in the baobab trade need to conduct product awareness campaigns for consumers to know and buy their products, which will consequently translate into making more profits. Baobab products could leverage the export base for Malawi if baobab trade could be formally linked to international markets.

There is need for actors in the baobab trade to be trained in fruit handling, good storage and quality control measures as it affects the final product quality and to remain competitive in the local and international market. Further, actors of baobab trade need to certify their products with bodies dealing with product standards, for easy entry into chain stores and international markets, which would fetch them higher prices and increase actors' profit. There is a need for the Government of Malawi to support MBS in constructing their own laboratories and human resource to fast-track the quality control processes rather than relying on other bodies as the processes take long. To achieve the goal of promoting market linkages at national level the Ministry of Industry and Trade should be transparent in sharing all the relevant market information with the local actors.

This study further recommends that, since Malawi is the key producer of baobab pulp in the Southern region of Africa, there is need for a domestication program of baobab to sustain

production of improved products. The Department of Forestry and research institutions in Malawi should promote the domestication of baobab trees and shortening its precocity to meet the current and future demand. This study also encourages development and enforcement of by-laws by traditional leaders for communal trees and individual ownership rather than communal ownership.

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APPENDICES

Appendix A: Household Questionnaire

Value chain analysis of baobab products for improved marketing and sustainability of their trade in Malawi

Questionnaire No:..... Name of respondent:

Village:..... Household GPS Coordinates:

EPA:..... Southing:.....

Date:..... Easting:.....

SECTION 1: This section seeks to identify the actors involved in specific baobab production and distribution along the value chain and map out their relationships.

Type of Actor:

- (i) Tree owner (ii) Collector (iii) Vendor (iv) Processor (v) Retailer (vi) **Other**
(*specify*)

1 Household characteristics

Information required	Response	Code
a. Relationship of interviewee to household head		1=Head 2=Spouse 3 =Son 4 =Daughter 5 =Relative 6 =Other (<i>specify</i>).....
b. What is the marital status of the respondent?		1=single 2=married 3=divorced 4=widowed
c. Age of respondent		
d. Sex of the respondent?		1=Female 2=Male
e. Household head's ethnicity/tribe		1=Chewa; 2=Ngoni; 3=Yao; 4=Lomwe; 5=Ngonde 6=Tumbuka 7=Other (<i>specify</i>).....

f. Level of formal education of respondent		1= None 2= Primary school (not completed) 3= Primary school (completed)	4= Secondary school 5= Post-secondary 6=Other (specify).....
g. Main occupation of household head.		1= Farming 2= Business 3= Employed 4=Other (specify).....	

2 What is the total number of persons working full time (8hrs/day) in the baobab trade?

Category	Half day	Full time
a. Below 15 years		
b. Between 15 and 35 years		
c. Between 35 and 65 years		
d. Above 65 years		

3 Source and use of baobab (*Adansonia digitata*)

a Where do you get baobab products from?

- (i) individual claimed trees (ii) communal forests (iii) open access (iv) buy

b How do you use your baobab products?

- (i) home consumption (ii)sale (iii) both i and ii (iv)other (specify).....

c Which part of the plant do you use?

- (i) Fruit (ii) Leaves (iii) Bark (iv) Root (v) Seed (vi)other (specify).....

d What do you use the part for?

- (i) Food (ii) Sale (iii) Medicine (iv) rope (v) other (specify).....

e During which months of the year are baobab products available?

Products Name	Months of Year				
	Jan-Marc	April-Jun	July-Sept	Oct-Dec	Others
Fruits					
Leaves					

Root					
Bark					
Seed					

f During which months of the year are baobab products edible?

Products Name	Months of Year				
	Jan-Marc	April-Jun	July-Sept	Oct-Dec	Others
Fruits					
Leaves					
Seeds					

g On the market, who buys more of these products?

	Products name						
	Fruits	Pulp	Leaves	Bark	Seeds	Roots	Other
Women							
Men							
Girls							
Boys							

h Why do people above (9) dominate in the business?

i Who buys your products?

(i) final consumer (ii) vendor (iii) processors (iv) companies (v) other (specify).....

j Where are the buyers from?

(i) City (ii) Urban (iii) Within the village (iv) From other villages

k Who are supporters of baobab trade you know

(i) Banks (ii) forest officers (iii) ministry of trade officials (iv) transporters (v) other

l What services do they offer?

.....

SECTION 2: This section seeks to evaluate the distribution of baobab benefits among economic actors along the value chain.

a Are you engaged in any baobab business?

(i) Yes (ii) No

bIf NO, give reasons for your answer

Go to institutional arrangement and institutions

If YES, go to c

c do you work alone or in groups?

(i) alone (ii) in group

Table 1: Distribution of benefits along the value chain

1	Actor	Product type	Unit of measure	Price (MK)	Value added	Final cost (MK)

Product codes: (i) Fruit (ii) Pulp (iii) Juice (iv) lollies (freezes) (v) seed (iv) Other

.....

d What is the measuring unit, unit price, quantity and revenue of the product sold?

Product	Quantity collected/season	Quantity sold/season	Measuring unit	Unit Price	Weight	Revenue/season
Fruit						
Pulp						
Leaf						
Seed						
Other <i>(specify)</i>						

e Who sets the price of baobab products?

(i) buyer (ii)seller (iii)huggle (iv) other *(specify)*.....

f What factors mainly affects the price?

(i) taste (ii)quality (iii)season (iv) other *(specify)*.....

g What market outlet do you use to sell your baobab products from?

(i) home (ii) roadside (iii) informal markets (undesignated) (iv) formal markets (v) other (specify).....

h What mode of transport do you use to go and buy/sell your products?

(i) On-foot (head load) (ii) Bicycle (iii) Ox-cart (iv) Vehicle (v) Other specify.....

i How long does it take to transport to the market?.....hrs

j What are the transportation costs?

k How do you store your baobab products for processing before sales?

l What are your storage costs?

m What costs do you incur in the selling of the products?

All any other costs incurred

Costs	Amount (MK)	
	Month	Year
Management of trees		
Sticks for plucking		
Labour to pluck		
Drying		
Packaging		
Labour to load		
Labour to offload		
Transport		
Shelling		
Grading		
Storage		
Additives		
Food (for all the times / day)		
Accommodation		
Market Fee		
TOTAL		

SECTION 3: This section seeks to analyse the institutions and institutional arrangements that govern trade at local, district and national levels.

a Do you have any rules that you follow in baobab management, fruit collection and business?

b What challenges do you meet in the baobab business?

c What should be done to enhance the business?

d What are the steps taken to ensure total quality management in the baobab product industry?

Appendix B: Checklist for FGDS

Name of company.....

District..... **Contacts:**

Date..... **Type of Actor**.....

- 1) What products are you selling?
- 2) What baobab product do you use as a raw material?
- 3) Who are your major suppliers of the baobab raw material?
- 4) What is the measuring unit of the raw material you use to buy - how many do you buy?
- 5) What quantities of baobab raw material do you purchase per annum?
- 6) What is the cost of the raw materials per annum?
- 7) What is the measuring unit of the product you sell?
- 8) What is the quantity of baobab for producing a unit? Eg bottle
- 9) How many units are manufactured per day?
- 10) What is the manufacturing schedule, eg everyday or....?
- 11) How much does it cost to produce a unit?
- 12) What quantities do you produce per annum?
- 13) Who sets the price?
 - a. Industry
 - b. vendors
 - c. both
 - d. other (specify)
- 14) What is the wholesale price per tonne?
- 15) Who buys your product?
- 16) Who are your competitors?
- 17) Do you sell locally or internationally or both?
- 18) If you sell international what is the export value?
- 19) Do you pay tax?
- 20) If yes how much per month?
- 21) What are the steps taken to ensure total quality management in the baobab product industry?
- 22) Is the forest department in any way involved in the baobab trade?
- 23) Outline the regulations that you follow in managing your business
- 24) Who sets these regulations?
- 25) What are the challenges faced in the baobab business?
- 26) What could be done to increase your income from the baobab trade?

Appendix C: Checklist for KIIs

Name

District..... **Contacts:**

Date.....

1. Are you aware of baobab trade in Malawi?
2. Do you know any actors involved in baobab trade, how are they?
3. Do you know any regulations governing this trade?
4. Are there any standards for the trade?
5. Do actors involved in baobab trade pay tax, if so which type?
6. Do you know any supporters of baobab trade?
7. How is your body connected with baobab business?
8. What challenges are there?
9. What can happen to enhance the trade of baobab?

Appendix D: Baobab fruits being sun dried on elevated surface in Mangochi



Appendix E: Friedman's 2 way ANOVA

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of Variable Cost (MK), Revenue (MK) and Gross Income are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix F: A truck full of baobab bags leaving for the city markets



Appendix G: Small and big measuring units of baobab products at the market



Appendix H: Challenges faced by baobab actors in the trade

Harvester	Challenges faced
	Lack of capacity to domesticate baobab trees Cutting down branches during harvesting Lack of market information Poor road infrastructure
Wholesaler	Collateral requirement by the banks Zero company market Lack of storage facilities Low supply of baobab raw material
Processor	Lack of information on export market Lack of capacity to meet international standards Persistent electricity blackout High administration costs Failing to maintain equipment Delay to certify baobab products Low quality raw material
Retailer	Few baobab suppliers
Exporter	High shipping cost High competition High packaging cost Low quality raw material

Appendix I: Bags of baobab pulp lay on the ground in a storage area in Nchesi market



Appendix J: Baobab oil packaged in an international standard bottle



Appendix L: Certificate of analysis for baobab oil


Japan Food Research Laboratories
 Authorized by the Japanese Government
 52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo 151-0062, Japan
<http://www.jfri.or.jp/>
 No. 15001032001-04 1/2
 February 20, 2015

CERTIFICATE OF ANALYSIS

Client: JICA OVOP Project (Malawi)
P. O. Box 30321, Capital City, Lilongwe 3, Malawi

Sample name: Baobab Oil

Received date: January 28, 2015

This is to certify that the following result(s) have been obtained from our analysis on the above-mentioned sample(s) submitted by the client.

Test Result(s) Test Item	Result	CL	N	M
Total tocopherols (Vitamin E)	93.3 mg/100g			
α-Tocopherol	2.7 mg/100g			
β-Tocopherol	0.5 mg/100g			
γ-Tocopherol	82.3 mg/100g			
δ-Tocopherol	7.8 mg/100g			
Free amino acids				
Free arginine	Not detected	1 mg/100g		
Free lysine	Not detected	1 mg/100g		
Free histidine	Not detected	1 mg/100g		
Free phenylalanine	Not detected	1 mg/100g		
Free tyrosine	Not detected	1 mg/100g		
Free leucine	Not detected	1 mg/100g		
Free isoleucine	Not detected	1 mg/100g		
Free methionine	Not detected	1 mg/100g		
Free valine	Not detected	1 mg/100g		
Free alanine	Not detected	1 mg/100g		
Free glycine	Not detected	1 mg/100g		
Free proline	Not detected	1 mg/100g		
Free glutamic acid	Not detected	1 mg/100g		
Free serine	Not detected	1 mg/100g		
Free threonine	Not detected	1 mg/100g		
Free aspartic acid	Not detected	1 mg/100g		
Free tryptophan	Not detected	1 mg/100g		
Free cystine	Not detected	1 mg/100g		
Methanol	Not detected	20 ppm		
Arsenic (as As)	Not detected	0.1 ppm		
Lead	Not detected	0.05 ppm		
Cadmium	Not detected	0.01 ppm		
Mercury	Not detected	0.01 ppm		
Aerobic plate count	Not more than 100/g			
Viable molds count	2.1 × 10 ² /g			
Formaldehyde	Not detected	20 ppm		

Quantitation limit N: Notes M: Method

Methods of Analysis in Health Science 2000, edited by The Pharmaceutical Society of Japan.

一般社団法人
日本食品分析センター

Appendix M: Rules between baobab association and powder exporting company

- All members of the association must attend all trainings offered annually
- Every member should have a drying facilities (thandara) behind his/her backyard
- Collect only those fruits which have fallen on the ground
- Only collect fruits from natural forests (virgin forests)
- Do not recycle packaging material and only use packaging materials provided by the exporting company
- Process all the fruits in the warehouse arranged by the exporting company
- Wear uniforms, remove shoes and jewelry, take a bath before entering the warehouse
- If one did not attend a meeting or is late must pay a fine of K200 (US\$0.3)
- Buying price is agreed yearly before harvesting season begins