UNIVERSITY FOR DEVELOPMENT STUDIES

VALUE CHAIN MAPPING OF SHEA AND HONEY AS NON-TIMBER FOREST PRODUCTS IN NORTHERN GHANA

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BY:

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THESIS SUBMITTED TO THE DEPARTMENT OF AFRICAN AND GENERAL STUDIES, FACULTY OF INTEGRATED DEVELOPMENT STUDIES, UNIVERSITY FOR DEVELOPMENT STUDIES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN DEVELOPMENT STUDIES

MARCH, 2016

DECLARATION

Student

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere:

Candidate's

Signature…….Date:……

Name: Timothy Khan Aikins

Supervisor

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University for Development Studies.

Principal Supervisor's

Signature…….Date:……

Name: Professor David Millar

ABSTRACT

Shea fruits and honey are important non-timber forest products which provide income for most rural poor people in Northern Ghana. However, little attention is given the shea and honey sector in Northern Ghana regarding its management, use, value addition and market. The study was therefore carried out to determine the yields of honey and densities of shea trees, local uses and market opportunities of shea and honey, local conservation practices for sustainable harvest of shea and honey, identify the shea and honey value-chains currently in operation and to identify the constraints in shea and honey value-chain development. The primary data collection process made use of mainly key informant interviews, personal interviews and quadrats. The results showed that bee keepers in Northern Ghana harvest about 2-5gallons (14kg-34kg) of honey per hive per year. Shea seedlings regeneration and matured shea tree densities are higher in Northern Region as compared to the Upper East Region. The study also revealed several uses of shea and honey including medicinal and food uses. In terms of market access, majority of the honey producers in Upper East Region have ready market for their products unlike the producers in the Northern Region. Most of the communities have instituted several by-laws/regulations to ensure the sustainable harvest of shea fruits and honey. The challenges facing the honey and the shea sectors include poor pricing and inadequate market linkages. In conclusion, the study showed that Northern Ghana has great potentials in the honey and the shea sectors. It is recommended that a strong functioning marketing system composed of traders and producers associations should be formed to enhance capacity building and bargain for fair prices.

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DEDICATION

I dedicate this work to dear my wife, Mrs Angela Achiaa Aikins and my son Fiifi Annor Aikins.

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LIST OF ACRONYMS

CBE	Cocoa butter equivalent
CBR	Cocoa butter replacement
CODIT	The Institute of Commodity and Organizational Development
CSRC	Community Self Reliance Centre
FAO	Food and Agriculture Organization
GEPC	Ghana Export Promotion Council
IAEP	Integrated Apiculture and Environmental Protection
IFCAE	Institute for Culture and Ecology
ITC	International Trade Centre
KTBH	Kenyan Top Bar Hive
NGOs	Non-Governmental Organizations
NTFPs	Non Timber Forest Products
SPSS	Statistical Package for Social Sciences
UNIDO	United Nations Industrial Development Organization
VCD	Value Chain Development

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Value chain is the full scope of activities that are required to bring an item or service from origination, through the intermediary phases of production, conveyance to final customers, and last disposal after use (Kaplinsky, 2004). As the item goes through the several phases of the value chain, the value of the item increases. This incorporates activities like design, production, marketing, supply and support services up to the last shopper. The activities involved in a value chain can be contained inside of a solitary firm or divided among distinctive firms and within a single land area or spread over more extensive areas (Herr and Muzira, 2009).

In business, people take raw materials and turn them into something of worth to people by adding value to them. In the manufacturing industries, manufacturers add value to raw materials which are of little use to the consumers (e.g. shea nuts) and changing it into something that persons are ready to pay money for (e.g. shea butter). As a rule, the more value you create, the more individuals will be ready to pay a decent cost for your item or service, and the more they will continue purchasing from you.

Shea nuts and honey are important non-timber forest products (NTFPs) which provide income for most rural poor people. Shea nuts and honey serve as a major income source for many rural people especially in seasons where their crops fail

(Osei-Tutu *et al*, 2012) as a result of bad weather and also during the long dry season when crop production ceases. In Northern Ghana, women collect wild shea fruits every year and process them into butter and other by-products like soap. Many rural women are into shea nut processing and butter extraction as a major source of livelihood. Shea nuts and butter are sold at all local markets mostly by women who process themselves or buy from others to sell. Others are into full time business of buying shea nuts in bulk for butter manufacturing and export.

Wild honey harvesting is also an economic activity done in Northern Ghana mostly by men to support their major livelihood activities. Honey is usually harvested in the wild using fire to burn bees colonized in trees. Bee keeping business is on the rise in Northern Ghana. Some Non-Governmental Organizations such as Jacksally Youth Group, TRAX Ghana, Integrated Apiculture and Environmental Protection (IAEP), and Community Self Reliance Centre (CSRC) have given both women and men training in bee keeping. Most of them were given bee hives and bee keeping equipment to colonize wild bees in their hives for producing honey. Honey harvested by these bee keepers are processed and kept in gallons and other containers for sale at various markets to supplement their income. Others are also into the business of buying raw honey from these keepers, further process and package them for the local and international markets.

Non-timber forest products (NTFPs) have been vital to the livelihoods of the occupants of North America from ancient times to the present. As elsewhere in the

world, early tenants of the forested areas of North America made broad utilization of the vegetation that encompassed them (Emery and Shandra, 2001).

In the developing countries about 80% of the population depend on NTFP for both their nutritional and health needs (Gautam and Devoc, 2002). NTFPs contribute significantly to the economy of the Nepalese. There are approximately 800 types of NTFPs are utilized as food, spices and perfumes and beauty care products as well as pharmaceuticals uses. Also local communities who also utilize NTFPs for their livelihoods have identified numerous species and various uses (Gautam and Devoc, 2002). For example *Griffonia simplicifolia* is used in the treatment of vomiting, diarrhoea, and pelvic congestion. It is also used as a purgative, an antiseptic for wounds and aphrodisiac, and as an insecticide to ward off lice from poultry (Ayensu, 1978).

NTFP also contributes to the income of households and the national economy. For example, in Indian NTFPs contribute an estimated average of 15% to the annual income of households (Malhotra, 1992). Also in Nepal, about 470,000 households are involved in the collection of medicinal plants and they contribute about US $ 22-70 million annually to the foreign exchange of the country (Olsen, 1998). In 2005, the U.S. Forest Service earned about $1,666,880 from the sales of permits and lease on national forest for about 103,662 commercial NTFPs in Oregon and Washington (IFCAE, 2008). Also, tons of wild mushrooms are collected every year from Pacific Northwest forests, engaging the services of a huge number of full and part time

gatherers and different sorts of workers (IFCAE, 2008). It shows from existing information that the markets for NTFPs are growing especially urban and rural areas throughout the world. There is growing local interest for product like game meat, forest food and fruits, medicinal plants, spices and furniture (FAO, 1990).

Ghana is the leading exporter of Shea nuts in the West African sub-region with annual nut export of 40,000 tonnes out of the about 55,000 tonnes of shea nuts it produces annually. Most shea exports consist of crude butter, as virtually no significant refining occurs in West Africa (Addaquay, 2004). Africa produces about 1,760,000 tonnes of raw shea nuts annually from its wild trees, mainly in the Savannah and Sahel regions, but producers harvest and process only a fraction, about 35% (about 600,000 tonnes), for exportation as butter or nuts (Addaquay, 2004). The West African variety of shea, *Vitellaria paradoxa*, has been traditionally processed and locally used as cooking oil or as butter for the skin and hair (Addaquay, 2004). Refined and fractioned shea oil is used as vegetable fat to enhance cocoa butter for chocolate and sweets in other parts of the world. Shea butter is the main edible oil for the people of Northern Ghana and part of Western Africa (Saul *et al*, 2003). Despite increasingly being replaced by commercially produced lotions in many communities, shea butter is traditionally used as a skin and hair moisturizer and for protection against the sun (Ezema and Ogujiofor, 1992). Shea butter is also valued medicinally for a number of uses. It is used to relieve rheumatic and joint pains and is applied to open wounds to quicken healing times and prevent infection. Traditionally, shea

butter is rubbed on pregnant women during child birth, new born babies and adolescents because of its soothing properties (Moore, 2008).

Aside from being highly nutritious, the fruit pulp is also taken for its laxative properties (Soladoye *et al,* 1989). By-products of the shea butter production process include the water used in washing the butter, the seed husks and the seed shells. The remaining water has an oily texture and is used to waterproof mud hut walls, doors and windows as well as beehives (Marchand, 1988). The seed husks reportedly make good mulch and fertilizer and along with the seed shells are used as fuel (FAO, 1988).

Shea nuts have has a history of international use dating back to the 1920s. Shea was first accepted as an important export for the West Africa sub region in the 1920s when their products were being used in European chocolate, cosmetics and soaps (Saul *et al*., 2003). Shea is exported either as nuts after the roasting process or butter after processing (Boffa, 2000). The FAO estimates that about 650,000 t of shea nuts are produced annually from the main producing countries of Ghana (the world's single largest exporter of sheanuts from 2000 to 2003), Benin, Burkina Faso, Togo, Côte d'Ivoire, Mali and Nigeria. The value of one metric ton of shea nuts varied from $4,674 in the year 2000 to $6,654 in 2001. This high volatility of the price of shea nuts on the international market makes it an undependable export product (Carr *et al*, 2000). Despite this, shea nuts are still highly valued mainly for its use as a cocoa butter equivalent (CBE) because it is cheaper than cocoa butter and also better improves the quality of chocolates (Chalfin, 2004). Although some countries do not

allow any CBEs in chocolate production, others allow between 5-15% of CBE content (Vermilye, 2004). Furthermore, France and Belgium do not allow shea butter as a CBE but they permit its usage as a cocoa butter replacement (CBR) for other confectionaries other than chocolate (Hall *et al*, 1996).

1.2 PROBLEM STATEMENT

The forest in Southern Ghana provides timber for building of houses, furniture for export for foreign exchange. According to Boakye and Baffoe (2006), there are forest reserves in Northern, Upper West and Upper East Regions, but these do not produce timber. Some of these reserves protect the water sources and catchments of major rivers flowing into the Volta Lake. These forests provide the indigenes with non-timber forest products (NTFPs) such as shea nuts and honey.

Northern Ghana falls in the savannah ecological zone and records harsh temperatures during the dry season. Agriculture does not fulfil the requirements of the people during this period of the year, therefore, people in this area look for other options compatible with the weather and resource conditions of the districts. Picking and processing of shea and bee keeping and marketing of honey are among the top options for the livelihoods of the local communities in Northern Ghana.

In areas where the people have knowledge about NTFPs, accessing market for the few they harvest such as shea and honey is difficult not mentioning their low prices. Although both shea and honey products are economically and socially important,

inadequate studies have been done in the study area to improve the sector. The timber as well as the NTFPs needs to be properly managed in a sustainable way as a source of income. *Hence the research problem is that there is ineffective economic development of the shea and honey sectors of the rural communities of Northern Ghana as a result of little information available regarding the resource base management, market opportunities, value addition and constraints to these sectors.*

1.3 JUSTIFICATION FOR THE STUDY

NTFPs which are also resources from the forest need to be developed as an alternative livelihood product to timber. The exploitation of these NTFPs does not necessitate the cutting down of trees. The products when developed well could generate more income than the timber industry. A tree could take over hundred years to become merchantable for harvesting, continuous harvesting without serious regeneration is not a sustainable enterprise. NTFPs on the other hand take few months to years to become ready for exploitation. Hence, the development and exploitation of NTFPs will not only serve as a source of livelihood for people but also help in the conservation of our natural forest. This will continue to reduce the rate of deforestation and the alarming issues of climate change, as trees are the major carbon sinks in our ecosystem. A value analysis of the Amazonian rainforest in Peru found that utilization of NTFPs can essentially yield greater net income per hectare than timber harvest of the same area, while maintaining the ecological value of the area (Peters *et al*, 1989).

The estimated total value in world trade of NTFPs is approximately US $1.1 billion and the market has grown by nearly 20% annually over the last twenty years (Wilkinson and Elevitch, 2000). NTFPs have potential as a means of generating forest-based economic development. Sustainable management of forest products other than timber can create full or part-time employment opportunities for people living in or near forest areas. As the sustainable management of these products can increase employment opportunities, governments (particularly those of the Global South) are placing special emphasis on it (Corbridge and Kumar, 2002).

The present research on value chain analysis of shea and honey production with regards to NTFPs development will aid to extract information for sustainable harvesting and management of shea and honey in Northern Ghana. Besides that, this study will also be useful for the economic upliftment of the people through enterprises development of shea and honey resources.

Although both shea and honey products are of social and economic importance, not adequate studies have been conducted in the study area to improve the sector. This research therefore, has contributed to filling the information gap by exploring the shea and honey marketing chains and constraints hindering their supply in Northern Ghana.

1.4 MAIN RESEARCH QUESTION

The main research question for the study is:

What accounts for the value chain mapping of shea and honey production in Northern Ghana?

1.4.1 Sub research questions

The sub research questions guiding the study are;

1. What are the yields of honey and densities of shea trees in Northern Ghana?
2. What are the local uses and market opportunities of shea and honey in Northern Ghana?
3. Are there local conservation practices in place to ensure the sustainable harvest of shea and honey in Northern Ghana?
4. What are the shea and honey value-chains currently in operation?
5. Which constraints hinder the development of the shea and honey value chain in Northern Ghana?

1.5 RESEARCH OBJECTIVE

The main objective of the study is;

To conduct a value-chain mapping of the shea and honey sector in Northern Ghana.

1.5.1 Specific objectives

The sub research objectives guiding the study are;

1. To determine the yields of honey and densities of shea trees in Northern Ghana.

2. To determine the local uses and market opportunities of shea and honey in Northern Ghana.

3. To assess the local conservation practices in place to ensure the sustainable harvest of shea and honey in Northern Ghana.

4. To map the shea and honey value-chains currently in operation.

5. To study the constraints for shea and honey value-chain development in northern Ghana.

1.6 LIMITATIONS OF THE STUDY

The key constraint of this research was related to coverage of the study area. There are a number of recognized districts in shea and honey production in Northern Ghana. However, the study focused only in some district due to financial and time constraints. These districts were chosen based on random selection of communities known to be involved in shea processing and honey production.

1.7 ORGANIZATION OF THE STUDY

This research is structured into five Chapters. Chapter one looks at the background information about the topic, problem statement, justification of the study, research questions, research objectives and limitations of the study. Chapter two deals with the review of literature on the relevant issues pertaining to this research. Literature on value chain concept, value chain mapping of shea and honey, constraints to value development, uses of shea and honey as well as local management of non- timber

forest resources were reviewed. Chapter three describes the methodology used in this research. It includes information on the study area, sampling procedures, methods of data collection and analysis of the data. Chapter four presents the results of the research and also discussed the findings with respect to the relevant literature available. Chapter five summarizes the findings of the research, draws conclusions and gives recommendations based on the findings of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The main focus of this chapter is to review theoretical issues pertaining to this study. It covers the concept of value chain and with specific emphasis on shea and honey value chain mapping. Literature on constraints to the shea and honey value chain development is also discussed here. Furthermore, review on uses of shea and honey is presented here as well as literature on indigenous knowledge in the conservation of natural resources particularly NTFPs are also discussed here.

2.2 VALUE CHAIN CONCEPT

Kaplinsky (2004) defines value chain as the full range of activities that are essential to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers, and final disposal after use. Michael Porter was the first to use the value chain concept in the 1980's and He defined the value chain as the various activities which were performed in particular links in the chain (Melle *et al*, 2007). Furthermore Herr and Muzira (2009) describe value chain as the addition of value to raw products through the combination with other resources. The value of a product increases as it goes through the several stages of value chain. The activities constituting a value chain can be confined within a single firm or divided among diverse firms, as well as within a single geographical location or spread over wider areas (Herr and Muzira, 2009). The concept of a value chain has been seen as a

development tool that helps in identification of policies that can be implemented for individual producers and countries to increase their share of the gains (ITC, 2003).

According to UNIDO (2009), value chain analysis is the process of breaking a chain into its constituent parts in order to better understand its structure and functioning. The analysis consists of finding chain actors at each stage and understanding their functions and relationships. It also involves identifying value adding activities in the chain and assigning costs and added value to each of those activities constituting the chain (UNIDO, 2009). It also involves the evaluation of the flows of goods, information and finance through the various stages of the chain in order to identify hitches or opportunities to improve the input of specific actors and the general performance of the chain. Value chain analysis is progressively used by organizations to better target their support and investments among value chain participants (UNIDO, 2009).

According to McCormick and Schmitz (2001), value chain analysis is of practical and conceptual importance. Practically, value chain analysis acts as a way to appreciate problems and find ways of improving the situations of those with low earnings and little bargaining powers in the chain. Conceptually, the value chain analysis presents a good picture of the process of making value. It shows that production is not the only way to create value but a product is brought to market through a combination of activities, all of which add up to its final value (McCormick and Schmitz, 2001).

2.2.1 Drivers of Change for Value Chain Development

Herr and Muzira (2009), identifies five drivers of change that can prompt value chain development. According to the authors, these factors play an essential role in the value chain development of a commodity. These drivers include:

System efficiency

System efficiency is one of the major drivers of change in value chain development. According to Herr and Muzira (2009), if both small and large value chain stakeholders work together, there are opportunities for minimizing costs and maximizing productivity on the market. Studying the behaviour of buyers in the market, they always want to purchase goods at the maximum possible quality and at a cheaper price. They also want fast and flexible responses to their orders and shortest possible delivery times. To achieve these market requirements, Herr and Muzira (2009) recommend that all opportunities for maximizing system efficiency must to be discovered and this needs collaboration and coordination of activities between value chain participants (Herr and Muzira, 2009).

Product quality

Product quality is also another factor that drives value chain development. According to Herr and Muzira (2009), if businesses want to stay in the changing and competitive market, they need to make sure that their products and services meet the continuously changing market conditions and requirement. Value chains can compete against each other in terms of cost of production as well as the quality of products. Here what

matters is the level of satisfaction the consumer receives from the product obtained (Herr and Muzira, 2009).

Product differentiation

Product differentiation is also an important driver in the value chain development. Herr and Muzira (2009) reported that better cooperation and coordination of activities by participants along the value chain makes it difficult for competitors to copy the product and the production process as they need not only to copy the product but also the entire system. It is therefore necessary to study what competitors are doing and how they are doing it in order to get a competitive advantage over them. To achieve this there is the need for continuous innovation and learning within in the value chain. Therefore, if sectors want to remain competitive on world markets, there is the need for innovation and learning throughout the entire value chain (Herr and Muzira, 2009).

Environmental and Social standards

Guaranteeing good social and environmental standards also means, being able to trace products and services all the way back to their origin. This necessitates that businesses along the value chain collaborate. Nowadays consumers are demanding products that fulfil the environmental and social standards as they are now becoming increasingly aware of such requirements. To reduce environmental impact, consumers and other organizations as well as media and NGOs are mounting pressure on retail and multinational companies to improve their environment and social

standards. It is therefore in the interest of firms to react to this consumer demand (Herr and Muzira, 2009).

Enabling business environment

The final driver of change the prompt the value chain is an enabling business environment. According to Herr and Muzira (2009), the nature and success of business transactions within the chain depends on the environment as the value chains do not exist in isolation. The business environment consists of an immediate environment in which businesses are part of markets in which they use several resources and markets in order to produce goods and services. The market in turn is influenced by interventions, institutions and regulations that directly affect a particular sector (Herr and Muzira, 2009).

2.2.2 Value Chain Mapping

Value chain mapping is simply a flow diagram showing the actors and their roles in a chain. Mapping a chain involves creating a graphical representation of the links between businesses in value chains and other market players. Value chain maps gives a quick understanding of complex activities and also shows how core businesses in value chains are linked with the market actors in the immediate and broader business environment (McCormick and Schmitz, 2001).

A value chain map shows, in graphical form, all the key players in a particularly value chain. It presents the different supply channels that convert raw materials into

finished goods and then distribute those goods to final consumers; and the different markets where the products are sold. Draft value chain maps can be constructed using information provided by key informants and then later polished as more information is collected (Lusby and Panlibuton, 2007).

Herr and Muzira (2009) emphasized that value chain mapping is regularly confused with value chain research or development. Value chain research goes beyond the simple mapping of value chains in sectors but rather looks at the nature of the relationships between market players; the reasons for constraints that are preventing value chains from achieving the desired outcomes and identify alternative opportunities for income and employment creation. Strategies can therefore be formulated based on the findings of the value chain research that will finally lead to value chain development (Herr and Muzira, 2009).

According to the UNIDO (2009) working paper, the construction of a value chain map is in two stages: The initial stage is the drawing of an initial map to show the structure and flow of the chain in logical clusters, the main players in the chain and the activities carried out at the local level as well as links to activities at other domestic or foreign levels. Also the supporting services and their interactions, the links to the final market and some initial indications of size and importance. The second stage is quantifying the value chain. This involves detailing the basic maps drawn initially. Depending on the level of detail required for the research entry point,

this exercise may focus on elements such as size and scale of main players; production capacity; number of jobs; sales and export endpoints and concentration. The map derived will depend on the scope and purpose of the type of research carried out and its entry point or dimension (UNIDO, 2009).

A value chain map could be either a flow or a grid chart. A flow chart looks at the diverse tasks in a value chain and illustrates them as processes leading from raw material or conception to final consumption. This very basic map can then be used further for creating a list of market actors along the chain. A Grid chart on the other hand illustrates the diverse market channels within a sector, hence stressing the fact that value chains are complex systems and not just a simple linear relationship. Value chain map is vital in value chain research and analysis in order to comprehend the nature of specific relationships and also to help formulate suitable intervention strategies that effectively target specific channels (Herr and Muzira, 2009).

2.2.3 Identification of Value Chain Constraints

Identifying constraints and opportunities is not widely different from, but rather part of, value chain analysis. Value chain constraints and opportunities can be known by using structured interview guides, in interrogating value chain participants. Lusby and Panlibuton (2007) grouped constraints that affect the success of a business into seven broad categories illustrated in the table 2.1.

Table 2.1: Categories of Value Chain Constraints

CATEGORY	EXAMPLES
Technology/Product Development	Inappropriate or non-existent tools/ machinery/ technologies, Lack of technical skills and production techniques to produce to buyer specification and Lack of information on product demand.
Market Access	Lack of linkages to large buyers, Lack of marketing organizations or brokers, Lack of information on product demand, Lack of marketing techniques or methods, Lack of market outlets, High transportation cost.
Input Supply	Poor quality of raw materials, Lack of suppliers and Limited outreach by existing suppliers.
Management and Organization	Inability of producers to organize for economies of scale, Lack of specific training for various stakeholders in value chain, Poor organization of large buyers or suppliers and Lack of communication and/or cooperation between different stakeholders.
Policy	Import taxes that penalize local producers, Artificial price subsidies and Lack of regulations.
Finance	Lack of supplier credit, Lack of access of commercial funding, No alternatives to traditional bank lending and Inability to provide adequate collateral.
Infrastructure	Poor road, electricity, refrigeration facilities and telecommunications.

Source: Adopted from Lusby and Panlibuton (2007).

Generally, small enterprises are confronted with a wide range of constraints. In order to mature as an enterprise, they may need to overcome quite a lot of these constraints together. It is usually difficult to rank one is more essential than another. It is necessary to addressed all constraints concurrently need to be in order to achieve expected impact on small-scale producers. It is often a difficult task to weigh up importance of one constraint over another (Lusby and Panlibuton, 2007).

2.2.4 Value addition in value chains

Value addition is often mentioned in the context of value chain development, referring mainly to how local enterprises can generate more value within the local economy, thus creating more jobs and higher incomes. For example ketchup can be produced from fresh tomatoes by local farmers instead of just producing and selling fresh tomatoes. This move could bring higher revenues to the local economy and through that new job opportunities would be created (Herr and Muzira, 2009).

Ideally, value added signifies the value created during the process of manufacturing carried out by each industrial firm. It is measured as the difference between the value of all goods and services produced and the value of those purchased non-labour inputs which have been used in the production process. This type of measurement is devoid of double counting, as what individual establishments bought from the other is subtracted from the value of its own production. Inputs to factor in may include fuel, transportation repairs, materials and supplies, contract work electricity, maintenance

and industrial services as well as other. The worth at which the inputs were procured is deducted from sum revenue from manufacturing in order to obtain the firm's value added. Revenue generated from production can be recorded at basic or producer prices. The difference is that producer prices include indirect taxes leaving out subsidies.

This principle is applicable at each stage of the selected value chain. It is also of essence to differentiate, along these stages, goods and services t supplied by the chain members from those supplied external entities. The calculation of value added created throughout the chain presents a sound basis for devising possible upgrading strategies by emphasizing where value is added and by whom (UNIDO, 2009).

Herr and Muzira (2009) also added that Value added is a measure for the wealth created in the economy. Total value-added is equivalent to the total value of all services and products produced in the economy for consumption and investment (the gross domestic product), net of depreciation. To arrive at the value-added generated by a particular value chain, the cost of bought-in materials, components and services has to be deducted from the sales value. Springer-Heinze (2007) defined the components of total value generated by a value chain as;

Value-added = (total sales value) – (value of intermediate goods). Where;

Total Value (generated by the value chain) = price x volume of final product sold.

Value Added = Wages, Interests and rents, Depreciation, Direct taxes and Profit.

Intermediate Goods = Raw material/inputs, Finished products and Operational services.

2.2.5 Shea Value Chain Mapping: Actors and Functions

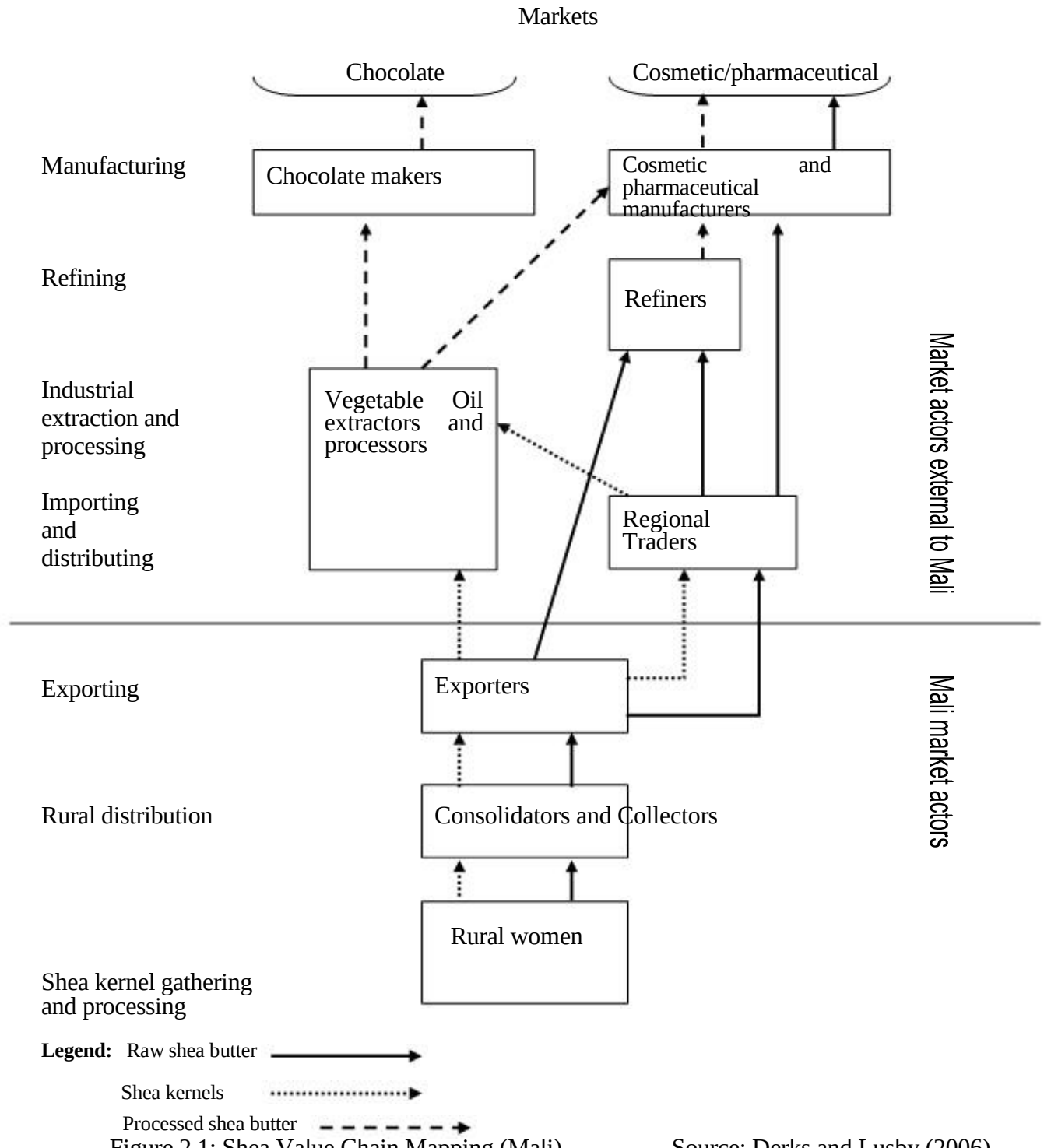

Figure 2.1: Shea Value Chain Mapping (Mali) Source: Derks and Lusby (2006)

This section looks briefly at shea value chain mapping, functions in the value chain (shown on the left side of the value chain map figure 2.1) as well as the market actors who perform those functions as described by Derks and Lusby (2006).

Gathering Shea Nuts

Traditionally, women dominate the shea nut picking and the processing of nuts into butter (Elias and Carney, 2007). Women mostly perform the function of processors and sellers of kernels and butter. In Mali, there are over 500,000 shea nut gatherers and processors in the shea kernel value chain. The women first gather ripe shea fruits and then process the fruit to the level where they can successfully store the kernels for later processing into butter or sell. The nut picking coincides with the start of the rains in June during which farm activities are also starting. Hence, women prefer to postpone additional processing until later when farm activities are minimal (Derks and Lusby, 2006). In Ghana, there are traditional rules in certain communities regarding where one can or cannot pick shea fruits. One can pick the fruits on one's own farmland and no one else is allowed to pick except for extended family members or permissions are obtained from the owner of the farm land. However, on fallow lands anyone is allowed to pick (Carette *et al*., 2009).

Shea kernel processing

Shea kernel processing involves removal of the pulp which helps prevent growth of fungi which decreases the oil content of the kernel. Boiling of the nuts is carried out

after the pulp has been removed; this is usually done to prevent germination (Carette *et al*., 2009). However, prolong boiling will destroy the desirable natural chemicals in the kernel that keep the kernel in good form. After boiling the nuts are dried immediately and properly to attract good market price. The shells are then crushed and removed from the kernel and the kernel subsequently dried for about 3 to 5 days. The kernels are ready for sale or processing into butter once they are well dried (Carette *et al*., 2009).

Collectors and Consolidators

Collectors purchase directly from producers, most of them at weekly markets but occasionally in the villages while the consolidators buy at weekly rural markets and supervise the activities of collectors. Consolidators and collectors are usually part of an informal network controlled by an exporter (Derks and Lusby, 2006).

Exporters

In the shea value chain, exporters are at the top of the chain. They coordinate and provide money for the purchase of shea kernels from rural traders (Derks and Lusby, 2006). Elias (2010), reported that large-scale business people in Burkina Faso with significant financial capital export shea kernels to their West African counterparts and overseas to European agro-food industries and refineries. The Author further stated that much of the trade in shea kernels across African borders mostly to Côte d'Ivoire, Bénin, Ghana, Mali, and Togo occurs informally (as contraband) and remains unaccounted for. According to Chalfin (2004), Ghanaian importers purchase Burkina's shea kernels from

urban Burkinabe exporters, yet they also acquire them, as they do in Ghana, from smaller-scale agents working throughout the country (Elias, 2010).

Importing/Processing

About 95% of the world's trade in shea kernels are controlled by two European vegetable oil firms Loders-Croklaan and Aarhus Karlshamn which also dominate the shea butter extraction and processing sector. However, there is increasing competition from companies in Japan and India like Fuji Oils. These companies sell finished vegetable oil products to wholesalers and also supply shea based products to producers of chocolate, cosmetics and pharmaceuticals. In West African there are few oil extraction industries, some of which extract oil on a toll basis for companies like Loders-Croklaan. Few West African countries including Ghana, Mali, Togo and Burkina Faso produce most of the shea kernels which are sourced by regional traders and sold to international oil companies (Derks and Lusby, 2006).

2.2.6 Honey Value Chain Mapping: Actors and Functions

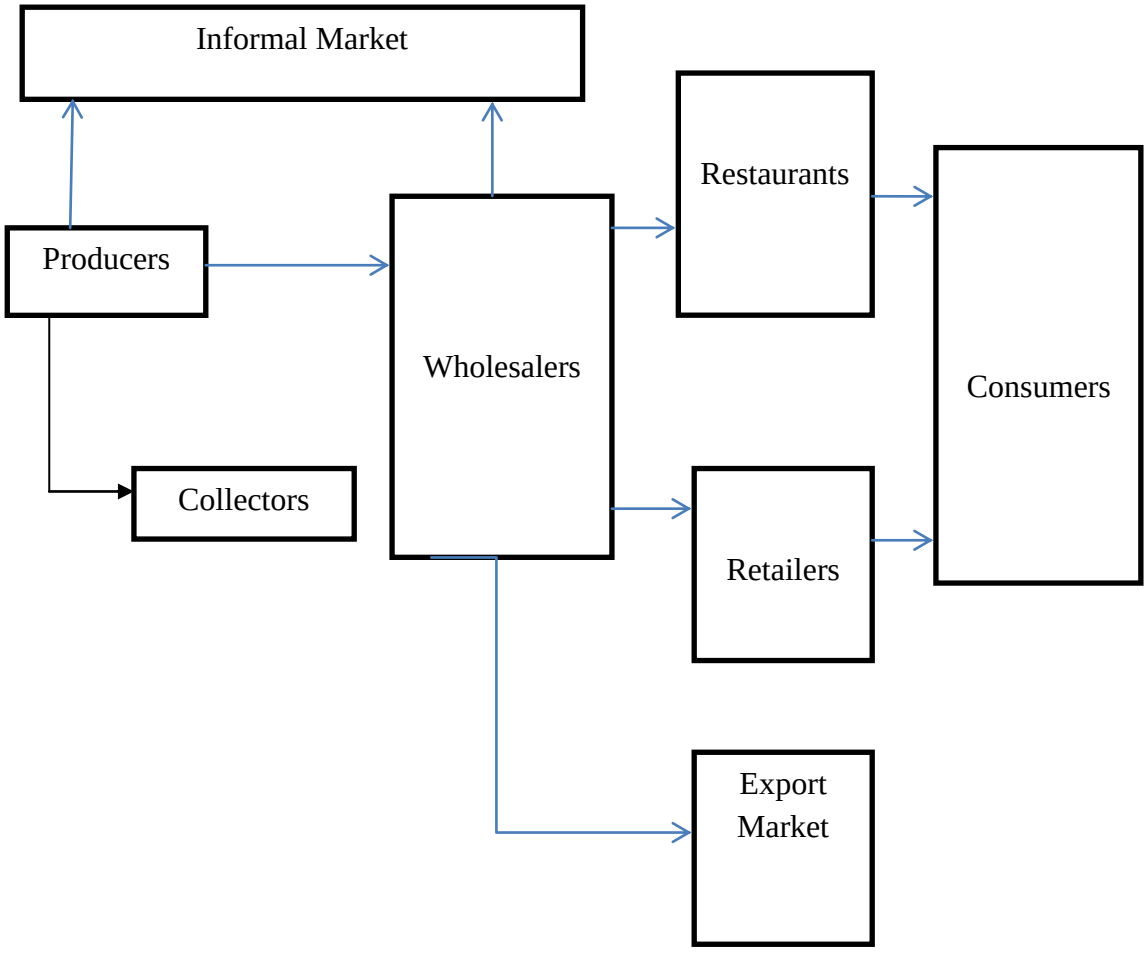

Figure 2.2: Honey value chain mapping (Yemen)

Source: Adopted from World Bank (2009)

The honey value chain is made up of different actors along the chain and these actors perform certain functions. The World Bank (2009) identified the actors in the honey value chain in Yemen to include; Input Suppliers, Producer, Wholesalers, Informal Market, Export Market, Retailers, Restaurants and Consumers (figure 2.2). Similarly, Kilimo (2012) identified the main actors in the honey value chain in Uganda to include: input suppliers, bee keepers, bulkers, transporters, processors, exporters, wholesalers,

retailers and consumers. It is clear from the above that the honey value chain in African has similar actors and functions along the chain in different countries.

Input Suppliers

The honey value chain starts with input suppliers start and they are mostly made up of organizations and or individuals businesspersons who are involved in the construction of bee hives and other equipment for sale to beekeepers. They generally focus on the production of modern bee hives like KTBH and the Langstroth as well as other bee keeping equipment (CODIT, 2009). Kilimo (2012) reported that in Uganda, the East African Beekeepers Limited is among the suppliers of bee keeping related input and supplies most of the bee keepers in Uganda. It supplies inputs like beehives (Kenyan Top Bar and Langstroth), bee suits, honey extractors, air-tight buckets, smokers and gloves.

Many beekeepers still use traditional bee hives despite the high level of consciousness about the benefit of using modern bee hives like KTBH and Langstroth. This is because of the high cost associated with acquiring modern bee hives like the KTBH and the Langstroth (CODIT, 2009). Similarly, there are also local beehive manufacturers in Uganda who make the traditional hives from tree logs (Kilimo, 2012). A modern langstroth bee hive with other bee keeping equipment cost about US$ 45 – 63 (CODIT, 2009).

Producers

China produces over 250,000 metric tonnes of honey making it the world's largest producer of honey. India is also well known in the honey industries and producers about 70,000 metric tonnes of honey and Nepal produces about 0.05% of the world's total honey (Joshi, 2008). In African, much of the honey produced is gathered rather than using modern hives and production techniques such as feeding and pest and disease control (Fadare, 2003).

In Uganda, there are about 2 million bee hives of which about 87% are traditional log hives and the remaining being Langstroth and KTBH. Majority of the bee keepers in Uganda are small scale producers who use indigenous management techniques as well as traditional hives in keeping bees. Also in Uganda it is estimated that each bee keeper owns an average of 28 hives with yield of 5Kg, 12Kg and 14Kg/Hive/Season from traditional, Kenyan Top Bar and langstroth hives respectively (Kilimo, 2012).

Similar situation has been reported in Rwanda. Most bee keepers in Rwanda use bark, log and grass hives and manage their bee colony through indigenous management practices. Traditional hives in Rwanda are generally low yielding as a result of its design characteristics. In high potential areas in Rwanda, bee hive ownership per bee per is 2.6 with an estimate yield of honey from traditional bee hives of 3.5kg per season which is below the average estimated yield of 5.6kg per season (CODIT, 2009). However, modern bee hives like the KTBH and the Langstroth are becoming increasingly used in

Rwanda although there have been some challenges with its colonization speed and productivity.

Processors

Producers and small scale traders carry out primary processing and sell their honey to traders. Some processors bottle their honey and sell it directly to the final consumers. However, secondary processing is done in processing factories. Here the beekeepers sell their honey directly to processors. Once processed, the processors sell the honey to retail outlets (Kilimo, 2012). According to Abebe (2009), some processors purchase honey from different areas directly from bee keepers or from collectors and process it for retail shops in towns. Here the processor uses different packing material ranging from 1kg to 30kg.

Processing of honey in Rwanda is common among bee keepers who use the traditional and KTBH. Semi-processing is carried out especially when extracting honey from log hives and KTBH. This is carried out using the self-drip method. However producers or honey bulking agents use simple tools like spoons to extract honey from combs of improved KTBH and Langstroth hives (CODIT, 2009).

Wholesalers

Wholesalers offer combination of tasks and services for diverse kinds of retailers, and perform desired distribution tasks for different kinds of processors. They also purchase the honey directly from bee keepers in small markets and sell it to consumers,

retailers and other collectors who visit the market centres from different areas (Abebe, 2009).

However in Ghana, Akangaamkum *et al* (2010) reported that wholesales of honey is virtually absent in the honey value chain. According to the authors, there are presently no devoted honey wholesalers. However, some honey processors also double as wholesalers by selling to retailers and other buyers in bulk.

Export Market

Akangaamkum *et al*. (2010), reported that there is a huge export market for honey in Ghana and that foreign buyers do enquire about the honey exports from Ghana according to information gotten from the Ghana Export Promotion Council (GEPC). According to Akangaamkum *et al* (2010), foreign order requests for honey from Ghana are projected at about 10,000 metric tons per year however; practically no commercial amounts of honey are exported from Ghana. This is because of the inadequate capacity to produce the right quantities and quality.

Retailers

This include super markets, restaurants and other large scale retailer who are into large scale importation of produce and retail it to final consumers. This basic task they perform is referred to as bulk breaking (Abebe, 2009). Retailers in the honey sector regularly buy directly from the bee keepers and or occasionally from the processors and resell to consumers. Retailers in Ghana are typically local women who trade in other

products as well as honey. However, the producers and processors at certain times retail directly to the consumers (Akangaamkum *et al*. (2010).

Consumers

Reasons underlying consumption of honey include its perceived medicinal value and its substitute for sugar. There is also an increasing level of demand for honey as an ingredient for herbal medicine, pharmaceutical and cosmetic industries in Uganda (Kilimo, 2012). In Rwanda, the end markets for honey encompass the final consumers of honey such as domestic consumers and industries who use honey as sugar substitute in food and as a food processing and or preservation agent respectively (CODIT, 2009). Similarly, in Ghana individual consumers form the highest end users of honey and its finished products. They usually buy honey from either shops/supermarkets in urban markets or buy directly from the producing centres (Akangaamkum *et al*. (2010).

2.2.7 Constraints in Honey Value Chain

In Africa, beekeeping as a sector is overlooked and deserted and attracts very little serious financial investment and support and this weakens the potential of the sector (Bees for Development, 2006).

The World Bank (2009), report in Yemen identified the following constraints facing the honey value chain actors particularly in Yamen. The report identified three major problems of which bee keepers are concerned with. They include the importation of Kashmiri honey, difficulties in obtaining modern beehives, and finally diseases attack

in the bee colonies. According to the report, mixing of the Kashmiri honey which has similar taste, texture and colour with local Seder has become a problem as it is difficult to differentiate between the two by taste and with the naked eye. According to the beekeepers especially those with modern beehives, imported wax contributed to increase in diseases. Similarly, wholesalers and exporters in Yemen have also expressed concerns about cheating through mixing (with Kashmiri) honey, poor packaging, and problems in obtaining the necessary certificates for exports (World Bank, 2009). The problem of mixing high quality honey with inferior ones by some traders or producers is also common in Ghana and usually consumers also find it difficult to differentiate. This affects the ability of producers who produce high quality honey to sell at higher prices as inferior honey producers are selling at lower prices.

Kilimo (2012) reported that producers have limited access to investible financial products as well as inadequate access to improved equipment. In addition, prolonged drought associated with climate change cause bees to abscond. Also competitions for resources with deforestation threatening the life of bees constitute the challenges to beekeeping in Uganda (Kilimo, 2012).

2.3 USES OF SHEA AND HONEY

2.3.1 Uses of Shea

The shea tree according to Pretaorius and Watt (2001), is considered a sacred tree by many communities and ethnic groups and plays important roles in religious and cultural ceremonies. It has been claimed to possess the potency of improving both

nutrition and food supply in lean seasons (Masters *et al*, 2010). According to Lovett and Haq (2000), almost every part of the tree is useful, either the fruit is eaten as food; leaves used as fodder as well as serve as an ingredient for making alkaline and paint. The leafy and non-leafy parts (bark, fruit, seed, and stem) of the tree have been used in treating infections like skin diseases, helminthes, diarrhoea and dysentery (Soladoye *et al*, 1989). Locally, shea butter is used in treating rheumatism, nasal congestion, inflammation of the nostrils, minor bone dislocation leprosy and, cough (Goreja, 2004; Olaniyan and Oje, 2007).

Axtell *et al* (1993), reported that shea nut contains about 60% fat nutrients and used as oil in in many homes in parts of the Sahel Africa (Njoku *et al*, 2000; Ndukwe *et al*, 2007). In the cosmetics industry, shea butter is use as an element of cosmetic formulations (Akihisa *et al*, 2010) and as a replacement for cocoa butter in chocolate industries (Ogbonnaya and Adgidizi, 2008). Shea butter is also used in the production of materials such as soap, detergents, candle and margarine, (Russo and Etherington, 2001).

Furthermore, shea fruit serves as nutritious and essential food in the lean season when food stocks are low, in the lean season when food stocks are low, any additional food is welcome and the . In the Sub-Saharan Africa, shea butter provides a major source of fat in the diets of many communities (Schreckenberg, 2004). Similarly, Elias (2010), reported that men Burkina Faso value shea fruit because they ripe during the agricultural period and calm down their hunger while working in the fields, thus allowing them to prolong their workdays.

2.3.2 Uses of Honey and its Products

Honey has since ancient days been served as both food and for medicinal purposes. Historically, the Romans, Chinese, Egyptians, and Greeks, used honey in the treatment of intestinal diseases and wounds (Al-Jabri, 2005). Honey when served as food is very nourishing and believed to improve one's physical performance. The supplies energy of about 3.5 kilo-cal/kg and demands needs little digestion. Honey can be eaten directly without processing or used in the preparation of candies, chewing gum and pastries (Joshi, 2008). It is usually used in place of sugar where sugar is not readily available (Joshi, 2008).

Honey has had a valued place in traditional medicine for centuries (Chowdhury, 1999) and modern medicine as well. The antioxidant potency of honey makes it medically very useful in treating diseases. This is due to its wide range of chemical component like organic acids, phenolics, peptides, and enzymes. Honey is also used for the treatment of conditions like gastrointestinal disturbances and inflammation (Eteraf-Oskouei and Najafi, 2013). It honey is highly efficient in treating irritating cough (Eteraf-Oskouei and Najafi, 2013). It also serves as laxative as it improves ones appetite and aid in controlling gastritis. Honey provides good relief to allergies and asthma and is efficient in treating burns and wounds (Joshi, 2008). Additionally, honey is for all imbalances of the lungs, skin disorders and cardiac pain According to Ezz El-Arab *et al,* (2006), honey is a good element in overcoming gastrointestinal diseases and liver, l problems.

Traditional honey is mixed with lemon for the treatment of sore throats as well as stomach pains (Kilimo, 2012). Hippocrates, the great Greek scientist utilized honey for baldness, contraception, wound healing, laxative action, cough and sore throat, eye diseases, topical antisepsis, prevention and treatment of scars (Bansal*et al*, 2005). Honey has also been used in the cosmetics industry for making skin-care products (Kilimo, 2012).

Numerous research bodies subjected honey to laboratory investigations and antibacterial activity of honey was the most notable discovery mentioned (Al-Waili and Haq, 2004; Emsen, 2007).

Healing of wounds is one of the most proven and effectual uses of honey (Medhi *et al*, 2008). A combination of cod liver oil and honey is very effective in treating boils, burns and ulcers (Bansal *et al*, 2005). It has been discovered that nearly all types of wounds respond quickly to honey therapy. Honey stimulates healing process. The cleansing action of honey on wounds makes it quickly clear any infections, stimulates tissue regeneration and decreases inflammation (Bansal *et al.*, 2005).

2.4 INDIGENOUS CONSERVATION MEASURES FOR NON-TIMBER FOREST PRODUCTS

The conservation of biodiversity through the use of traditional practices is increasingly as a basis for conservation of biodiversity is increasingly getting worldwide recognition (Kajembe *et al*, 2003; Moller *et al*, 2004; Saj *et al*, 2006). Since a number of the traditional conservation measures play similar role as those by the formal and current

conservation (Colding and Folke 2001), traditional practices can in this manner be precious in guaranteeing effective use of natural resources (Alieu, 2010).

Traditional practices involve the obedience to and inheritance of cultural practices from one generation to the other. These traditional and cultural practices influence the relations between people and their surroundings in a dynamic and complex way (Masalu *et al*, 2010). According to Gwali *et al* (2011), the conservation perspective of traditional customs and beliefs is borne out of the mutual benefits between shea tree use and associated beliefs or customs.

The shea tree (Vitellaria paradoxa) is considered as one of the trees which have been managed through traditional conservation and management practices for a very long time (Hall *et al.* 1996; Neumann *et al*, 1998). It is a dominant tree in the Sudano-Sahelian savannah vegetation and stretches over 6,000km long and 500km wide from Uganda to Senegal (Hall *et al*. 1996).

Managing shea trees in Uganda involves cutting down undesirable trees whiles some selected trees are maintained on the land. Pollarding and pruning are also commonly used as a management practices for shea to enhance fruiting. Subsequently, shea tree uses as well as the economic contribution to livelihoods of the local people are very important in the conservation of shea trees (Lovett and Haq, 2000).

Sustainable management and conservation of shea trees may be enhanced by promoting community involvement (Lufumpa, 2005). Local communities are recognized as a

central locus in conservation, in view of the decline in funding for conservation and increasing poverty in Africa (Agrawal and Gibson, 1999).

In Bardiya District of Nepal, the indigenous people undertake cultivation of certain Non-timber forest products. Some of the community forests dwellers have also established nurseries for the production of seedlings of medicinal plants (Uprety, 2010). According to Schreckenberg (1999), numerous individuals in Guinea plant and secure trees specifically around their homes and the yields of these trees belong to the grower. However, proceeds from naturally regenerated plant species can be collected freely except they are in someone's crop land (Schreckenberg, 1999). This together with increased conversion of land into permanent cropping systems means that protection, planting and management of trees on farms are becoming progressively more intensive (Okullo *et al*, 2003).

2.5 SHEA REGENERATION AND DENSITY

Shea regeneration occurs naturally and continuously in unmanaged lands, while and on farm lands regeneration occurs mainly during fallow periods. In the farming season all small vegetation is removed during ploughing, including the small shea trees. That is also why fallowing and the length of fallowing is considered as a crucial factor for shea tree regeneration (Lovett and Haq, 2000; Schreckenberg, 2004).

Several authors have communicated their worry on the absence of regeneration of the shea trees and the decreasing density of shea tree in the Sub-Saharan Africa (Kelly et al,

2007). This is ascribed to increasing human population which causes fallow periods to be shorter thus influencing regeneration of shea seedlings (Okullo et al., 2004). According to Gijsbers *et al* (1994), the density of shea trees had decreased with around 45 % in Burkina Faso, from 1957 to 1988 (Teklehaimanot, 2004; Elias, and Carney, 2007) and also with tree numbers decreasing from 230 trees per hectare to 11 trees per hectare in Sudan from 1940 and 2003 (Teklehaimanot, 2004). Furthermore, some also state that there is a pattern of aging of the shea trees which can be explained by the absence of regeneration (Lovett and Haq, 2000; Okullo *et al*., 2004).

2.6 CONCLUSIONS

There was consistency in literature on the shea and honey value chain analysis. The differences in literature on the shea and honey value chain mapping were due to differences in geographical settings and tradition of the people. Literature on uses of shea and honey are consistent with each other except for little variation usually from the cultural background or tradition of the people. Furthermore, literature strongly supports the role of indigenous people and their local conservation practices in ensuring the sustainable harvest of non-timber forest products such as shea and honey. Finally, literature reveals that the density of shea trees in the West African sub region is decreasing mainly due to human threats.

CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides an overview of the study area, the general methods that were used for this thesis, as well as details of the analytical methods used for the data analysis. The majority of the data were collected using key informant interviews, focus group discussions, direct and participant observations, personal interviews and Transects and Quadrats.

3.2 BACKGROUND OF THE STUDY AREA

The study was carried out in Northern and Upper East Regions. The study was carried out in twelve (12) communities (Bole, Mandari, Seripe, Tuna, Kananto, Kata, Sekouti, Dasabligo, Balantini, Dachio, Nankong and Kulsabilabok) in 7 districts in the Northern and Upper East Regions. Tree Aid an international NGO based in the United Kingdom in collaboration with some local NGOs (Jaksally Youth Group, Community Self Reliance Centre, Integrated Apiculture and Environmental Protection and TRAX Ghana) in Ghana have identified some communities in Northern Ghana which deal in honey and shea products. These communities have shea and honey producer groups who are into the processing and marketing of shea and honey products. These twelve (12) communities selected for this study were randomly chosen from the list of communities identified by these NGOs from the Northern and Upper East Regions. Kranjac-

Berisavljevic' *et al.* (1999), have provided ecological information on the Northern and Upper East Regions of the country.

Bole, Mandari and Seripe are located in the Bole district in Northern region with Bole as its capital. The district is situated at the western part of the Northern Region with a land area of about 4,800 km^2. According to the 2010 Population and Housing Census, the district has a population of 61,593 (Ghanadistricts.com).

Tuna is located in the Sawla-Tuna-Kalba District also in Northern Region with Sawla as its capital. The district is located in the western part of the Northern Region. The District shares boundaries with Bole District to the South, Wa West District and Wa East to the North, West Gonja District to the East and La Cote d'Ivoire to the West. The district has a population of 99,863 (Population and Housing Census, 2010) with land area of about 4,601 km^2. Some of the common trees found in the District are shea, dawadawa, kapok and mango (Ghanadistricts.com).

Kananto is located in the West Gonja District. It is located on the Damongo-Sawla road. The district has a population of 76,702 according to the 2000 population and Housing Census. In communities such Damongo, Achubunyor, Kotito No. 2, Daboya, environmental degradation has reached an alarming stages. Tree cutting for fuel wood, bush burning, gravel and sand mining are threatening the environment. The District Assembly has however, initiated actions to mitigate these activities that threaten the environment (Ghanadistricts.com).

Kata is located in the West Mamprusi District of the Northern Region with Walewale as the capital. The district covers a total land area of 5,013 km². The area lies in the Guinea Savannah zone with its characteristics widely space short trees. Nasia, White Volta and Kulpawn rivers are the major rivers in the district. The vegetation is burnt annually by bush fires during the dry season (Ghanadistricts.com).

Sekouti, Dosabligo and Kulsabilabok are located in the Talensi District with Tongo as its capital. The District shares boundary to the South by the West and East Mamprusi Districts, North by Bolgatanga District, East by Bawku West District and Kassena-Nankana District to the West. The district has three forest reserves covering a total area of 455.2km^2. The population depends on the forest reserves for their livelihood (Ghanadistricts.com).

Balantini and Dachio are located in the Bolgatanga municipal district with Bolgatanga as the capital. It has a total land area of 729 km^2. It has a population of 131, 550 (Population and Housing Census, 2010). The climate is classified as tropical with two seasons; wet and dry. The natural vegetation is guinea savannah woodland with it characteristic widely spaced short deciduous which gets burnt during the dry season. Shea tree, dawadawa, baobab and acacia are some of the economic trees found in the district (Ghanadistricts.com).

Nankong is located in the Kassena-Nankana West District in the Upper East Region. Its capital is Paga**.** The District shares boundaries with Burkina Faso, Builsa District, Sissala East District and Kassena-Nankana East Municipal to the North, South, West, and East respectively (Ghanadistricts.com).

3.3 SAMPLING METHOD

The primary goal of a research is to get representative data. To achieve this, we need to either enumerate the whole population or select a representative sample, such that the researcher can study the smaller group and produce correct generalizations about the larger population (Newman, 2003). Determination of the sample is subject to several factors including the type of sample, statistics to be used, uniformity of the population, time, and money and labour availability (Churchill and Iacobucci, 2002). Simple random sampling was used to select two regions out of the three regions in Northern Ghana and also to select twelve (12) communities from the list of the communities in the two regions that engaged in the shea and honey production as identified by Tree Aid organization and the local NGOs. A non-probability sampling (snow ball method) was adopted to identify the various market players involved in the shea and the honey industry to facilitate the mapping of the chain. The shea and honey producer groups in the selected communities were organized for the focus group discussions and 50% of the group members were randomly selected for the personal interviews.

3.3.1 Sampled Communities and Number of Respondents

Tables 3.1 and 3.2 show the sample communities and the number of people interviewed for the research.

Table 3.1 Sampled Bee Keeping Communities and Number of Respondents

Name of community (Honey)	Number of People interviewed	Percentage (%)	Number of Focus group discussions in each community
Seripe	8	13.3	1
Tuna	10	16.7	1
Kananto	16	26.7	1
Nankong	9	15.0	1
Dachio	9	15.0	1
Sekouti	8	13.3	1
Total	60	100	6

Table 3.2 Sampled Shea Processing Communities and Number of Respondents

Name of community (Shea)	Number of People interviewed	Percentage (%)	Number of focus group discussions in each community	Number of quadrats laid
Bole	10	16.7	1	18
Manderi	9	15	1	18
Kata	10	16.7	1	18
Kulsabilabok	10	16.7	1	18
Dosabligo	10	16.7	1	18
Balantini	11	18.3	1	18
Total	60	100.0	6	108

3.4 METHODS OF DATA COLLECTION

The primary data was collected using focus group discussion, participant and direct observations, personal interview, key informant interview and transect lines and quadrats.

3.4.1 Objectives-wise research methodology

Table 3.3 shows specific methods that were used in achieving each of the research objectives in the study.

Table 3.3 Objectives-wise research methodology

S.N.	Objectives	Methodologies
1.	To determine the yields of honey and densities of shea trees in Northern Ghana.	Personal Interview, Participant and Direct Observation and Quadrats.
2.	To determine the local uses and market opportunities of shea and honey in Northern Ghana.	Personal Interviews (shea and honey producers) and Key informant interview (market players)
3.	To identify the local conservation practices in place to ensure the sustainable harvest of shea and honey in Northern Ghana.	Key informants interview (Tree Chiefs and Elders of the community) Personal Interviews (shea nut pickers and honey producers) and Focus group discussions.
4.	To identify the shea and honey value-chains currently in operation.	Key Informant interview (with various market players) and Focused group discussions.
5.	To identify the constraints and potentials for shea and honey value-chain development in northern Ghana.	Personal Interviews (shea and honey producers) and Key Informant interview (all market players).

3.4.2 Key Informants Interview

Key informant interviews involve talking to a select group of individuals who are likely to provide the desired information on a particular subject. It involves interviewing people who possess information that can be solicited by the investigator. Key informant interviews are basically qualitative interviews which are conducted using interview guides (Kumar, 1989).

This technique was used to solicit data on the shea and honey value chains currently in operation, potentials and constraints for shea and honey value chain development in Northern Ghana. Information on market opportunities for shea and honey and indigenous conservation measures to ensure sustainable harvest of shea and honey were also solicited using key informant interviews. Traditional tree chiefs and group leaders were interviewed using interview guide as they have in-depth knowledge about the community. Lusby and Panlibuton (2007) stated that draft value chain maps can be constructed using information given by key informants and then polished as additional information is collected.

3.4.3 Focus-group discussions

Focus group discussions are similar to semi-structured interviews, but here a small group of people take part at the same time. During focus group discussions, the researcher works more as a moderator than as an interviewer (Goss, 1996). Focus group discussion is one of the most frequently used techniques for market studies. It is, however, also

used as an important methodology for social science research in general (Marshall and Rossman, 1999). "…a carefully constructed focus group discussion could replicate social relations and interactions. This is because communication within the group becomes multidimensional. As a result, group responses are better than the sum of responses from individuals (Hoggart *et al*, 2002).

Focus group discussions made up of the shea and honey producer groups were used to gather information on the constraints for shea and honey value chain development, local uses and market opportunities of shea and honey value chain and indigenous conservation measures in place to ensure the sustainable harvest of shea and honey.

Herr and Muzira (2009), stated that "Focus group discussions are particularly useful in understanding the dynamics of a particular value chain level: its perceptions about other market players, the relationships amongst group members as well as the nature of relationships with other market players and common constraints faced by the group". The purpose of this discussion is to use the social dynamics of the groups to excite members to reveal underlying opinions. The focus group discussion was facilitated with open ended questions which address the issues of interest to the research.

3.4.4 Participant and Direct observations

The methods of participant and direct observations were first developed through the studies of 'cultural anthropology' and 'qualitative sociology' (Marshall and Rossman, 1999). Presently it has been considered as the 'principle of reflexive explanation', which

could be the basis of all qualitative methodologies where the social science researcher works to be part of the research topic. The researcher not only gets the data or information from respondents, during questionnaire surveys or interviews, but at the same time can also study the surrounding environment that is affecting the main research topic. They can also analyse time, space and other important factors, which are not possible to picture through the words of interviewees (Francis, 1992).

During participant observation, the researcher has the chance to understand the real situation by direct participation in the research topic. The researcher gains first-hand knowledge on the research topic when this technique is used (Ghosal, 2010). Through direct observation, on the other hand, the researcher has an opportunity to record and note the real phenomena directly without actively getting involved in them. During participation, the researcher uses himself as a tool of methodology (Delamont, 2007). Participant and direct observation were carried out to collect information on the quantities of honey harvested, harvesting and processing of honey and also the collection and processing of shea nuts and butter.

3.4.5 Laying of Quadrats

Three (3) parallel transect lines spaced 50m apart were laid. Three quadrats of 5 x 5m for shea saplings were laid along the transect lines spaced 50m apart. Individual shea plant saplings in each plot were counted and the density determined to know the rate of natural regeneration of the wild shea trees. Also three (3) quadrats of 20 x 20m for

matured shea trees were laid along the three (3) transect lines spaced 50m apart. Individual matured shea trees in each plot were counted and the density determined to know the distribution of shea trees in the community. In all 108 quadrats, 18 in each of the 6 communities were laid at the shea tree growing sites where the people collect shea fruits. Density is the number of individuals of a species per unit area. In determining density, it is requires counting of individuals in a defined space and therefore help to define the numerical strength of the presence of a species in a specific area. It is estimated using the formula:

$$\text{Density (D)} = \frac{\text{Total no. of individuals of the species in all the plots}}{\text{Total no. of plots Studied}}$$ (Zobel *et al*, 1987).

3.4.6 Personal Interview

This method was used as the information required is more specific to certain individuals who are directly in shea and honey business. Semi- structured questionnaires were used as the interview guide during the personal interviews. Personal interviews were used to solicit information on the yields of honey, the local uses and market opportunities of shea and honey. It was also used to identify the indigenous conservation measures in place to ensure the sustainable harvest of shea and honey and finally to identify the constraints and potentials for shea and honey value-chain development in northern Ghana.

3.5 DATA ANALYSIS

Data analysis as described by Karma (1999) is the computation of certain measures along with searching for patterns of association that exist among data groups. In analysing data in general, Yin (1993), agrees that a number of closely related operations are performed with the purpose of summarizing the data collected and organizing them in such a manner that they answer the research question. Both qualitative and quantitative primary data were collected using the personal interview guide. Data from the interviews were analysed using SPSS to generate frequencies and percentages of responses as well as relationships between them. Cross tabulations were used to show the responses by respondents by region and cross classify were also used to compare responses within groups that have already been cross tabulated. The results were then presented in tables, charts and graphs. Data from the quadrats was analyze with Microsoft excel and presented with bars graphs with error bars showing where there is significant difference.

Two methods of analysing meaning as described by (Kvale, 1996) were used; meaning condensation ‘an abridgement of the meanings expressed by the interviewees into shorter formulations’ and narrative restructuring ‘the temporal and social organization of a text to bring out its meaning.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents and analyses the socio-demographic characteristics of the respondents. Relevant aspects of the characteristics that affect the value chain mapping of shea and honey are discussed. Also information on the density of shea trees and the regeneration rate of shea seedlings as well as the quantities of honey produced in Northern Ghana is presented under this chapter. This information will be useful in determining the current status of the shea trees and its implication for future availability. This chapter also presents the local uses and market opportunities of shea and honey, local conservation measures to ensure sustainable harvest of shea and honey and the constraints facing the shea and honey value chain in Northern Ghana.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

This subsection provides information on the characteristics of the respondents such as sex, age, marital statuses and occupations.

4.1.1 Sex of Respondents

Table 4.1 provides information on sex of the honey producers and the shea processors.

Table 4.1: Sex of Honey Producers and Shea Processors

Sex of Respondents	Honey Producers (%) (n=60)	Shea Processors (%) (n=60)
Male	58.3	1.7%
Female	41.7	98.3%
Total	100.0	100.0

Source: Field survey (2013)

The findings are that females dominate the shea (nuts and butter) while males dominate the honey production business in the Northern and the Upper East Regions (Table 4.1). 58.3% of the honey producers interviewed were males while 98.3% of the shea processors were females. It was realized from the research that women are the main traders in these Non-timber forest products (shea and honey) in the Northern and the Upper East Regions of Ghana. Women support their families through the sales of these products. The research probed further to find out why females dominate the shea business and it was revealed that the men regard the shea nuts and butter processing activities as solely women's business as it always involves setting fire to prepare the nuts and the butter which they link directly to the role of women in the kitchen.

According to Rammohan (2010), the rural women in Ghana are typically illiterate and are involved in other income generating activities such as farming and petty trading of which shea butter and nuts trading are not an exception. Also Chalfin (2004) reported that women have few opportunities to earn cash income meanwhile they are ultimately responsible for all expenses related to feeding, clothing and the wellbeing of their offspring, NTFPs (shea and honey) activities are one of these opportunities.

4.1.2 Age of Respondents

Table 4.2: Age of Honey Producers and Shea Processors

Age of Respondent	N	Minimum	Maximum	Mean	Std. Deviation
Honey Producers	60	25.0	65.0	41.43	9.13
Shea processors	60	20.0	68.0	39.47	11.53

Source: Field Survey (2013)

It was revealed from the results that the old women who cannot do more difficult or manual work are involved in the collection and processing of shea nuts and butter. They do this to generate income to feed their families. The minimum age recorded for the shea producers was 20 years, which means that even the young adults with no initial capital to start a business are easily involved in shea nut collection and butter processing to generate money to support their livelihood. Comparing this to the minimum age being 25 years recorded for the honey producers, it could be attributed to the fact that honey production involves capital investment and as such the very young ones cannot raise such money to start this business.

4.1.3 Marital Status of Respondents

n=60

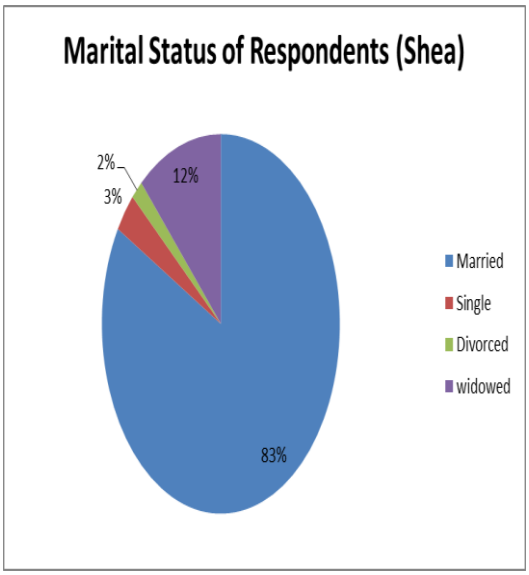

Figure 4.1 Marital statuses of Bee Keepers processors

n=60

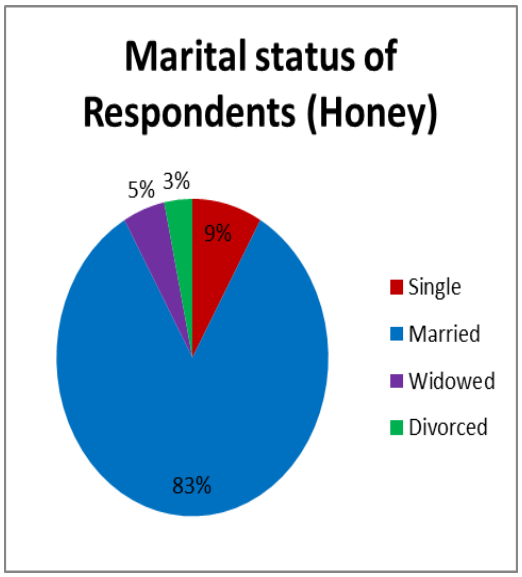

Figure 4.2 Marital statuses of Shea

Source: Field Survey (2013)

It was revealed from the study that majority (83%) of the shea producers are married with the least divorced or separated from their spouses. The high proportion of shea producers being married could be attributed to the fact that they needed to generate extra income to support their families. As shea nut picking is done on parklands which are owned by the community, they usually engage in it to get extra income. Also widows were the next larger group of people who are into shea business. This is because they may not have any financial support, therefore they engage in shea nut picking and processing to generate money to cater for their needs.

It was also realized that the majority (83%) of the bee keepers were married, next are the single followed by the widowed and with the least being divorced. The research probed further to find out why few single women partake in the bee keeping and it was realized that female honey producers are mostly encouraged by their husbands to go into the honey production and their husbands help them especially when mounting the hives on top of trees and also during harvesting of the honey. This could probably be the reason for the high numbers of married women involved in bee keeping business.

4.1.4 Main Occupations of Respondents

n=60

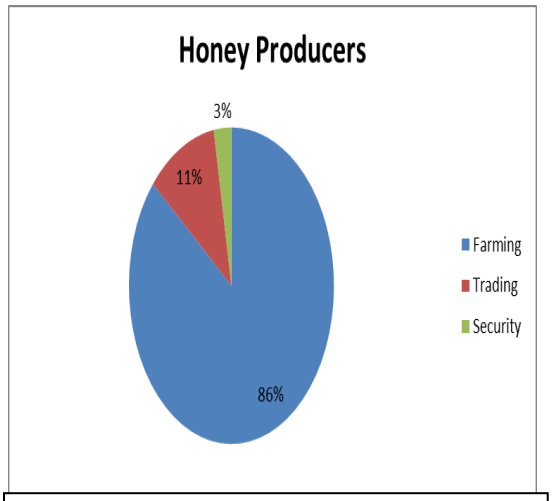

Figure 4.3 Main occupations of Bee Keepers

n=60

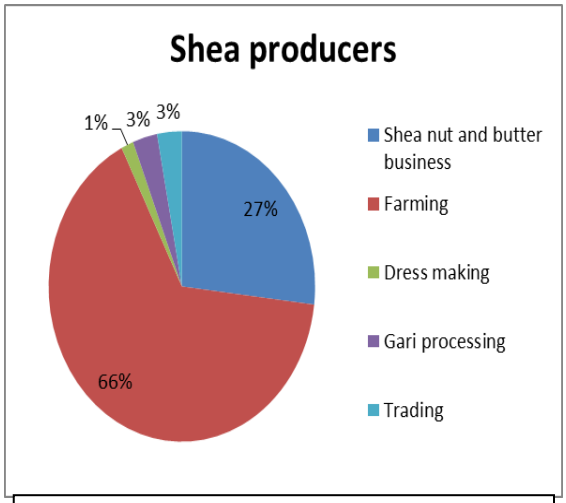

Figure 4.4 Main occupations of Shea Processors

Source: Field Survey (2013).

The research revealed that all the honey and shea producers are not solely into honey or shea business. They also have other livelihood activities they undertake to support their livelihood. They are mostly farmers who use these non- timber forest products (shea and

honey) as a safe net whenever their crops fail or when they are out of the cropping season. According to Chalfin (2004), NTFPs serve as a safety net for most rural people as their value lies primarily in their function of attenuating household vulnerability and increasing food security.

4.2 DENSITY OF SHEA TREES AND YIELD OF HONEY IN NORTHERN AND UPPER EAST REGIONS

The study also determined the density of shea trees and the yield of honey in the selected communities in the Northern and Upper East Regions. The findings are presented in the following subsections.

4.2.1 Density of Shea Trees in Northern and Upper East Regions

Shea regenerates itself naturally and although it may be aided by appropriate land management such as protection from fire or grazing livestock, it is not traditionally planted. Methods of natural regeneration include dissemination of the seeds by humans and birds. Figure 4.5 shows the natural regeneration rate of shea seedlings in Northern and Upper East Regions. The highest natural regeneration was recorded at Kata in the Northern Region and the least recorded in Dosabligo in the Upper East Region. At Kata the average regeneration rate is 8.4 seedlings per $25m^2$ whilst in Dosabligo the regeneration rate is 0.3 seedlings per $25m^2$. This means that for every $25m^2$ area of shea growing land covered in Dosabligo, you are likely not to find a single shea seedling. The

result showed no significant difference in the regeneration rate within different locations in a region as indicated by the error bars on the chart; however there is significant difference in the regeneration rate between the two regions. From the result, it can be concluded that regeneration is higher in the wetter vegetation zones (Northern Region) than in the drier vegetation zones (Upper East Region). The lower regeneration rate at the study sites in Upper East region may be attributed to the nature of the soil, which is mostly rocky, with little top soil and drier weather. It could also be as a result of the high demand of land for agricultural purposes which always go with ploughing of the soil. The ploughing results in destruction of shea seeds as well as the newly germinated shea seedlings.

The results confirms the works by Lovett and Haq (2000) and Schreckenberg (2004), that shea regeneration occurs naturally and continuously in unmanaged lands, while on farm lands its occurs mostly during fallow periods. However the fallow period in majority of the areas in Northern Ghana especially the Upper East region coincides with the dry season which is characterized by dry weather of no rains and high solar intensity which is not suitable for regeneration to occur. Also during the farming season ploughing of the farmlands usually results in the destruction of all vegetation including shea saplings. This is also a reason why the length of fallowing is considered as a critical factor for the regeneration of shea.

Also Okullo *et al*. (2003) reported that increasing human population causes fallow periods to grow shorter because of the high demand for crop land and also the

continuous cultivation on the same land and these negatively impact on shea tree regeneration.

In conclusion, the low regeneration rate of shea seedlings in the Upper East Region has a conservation implication and calls for a serious concern. Ecologically it implies that in years to come the density of matured shea trees will decrease greatly because of the slow rate of regeneration in the region.

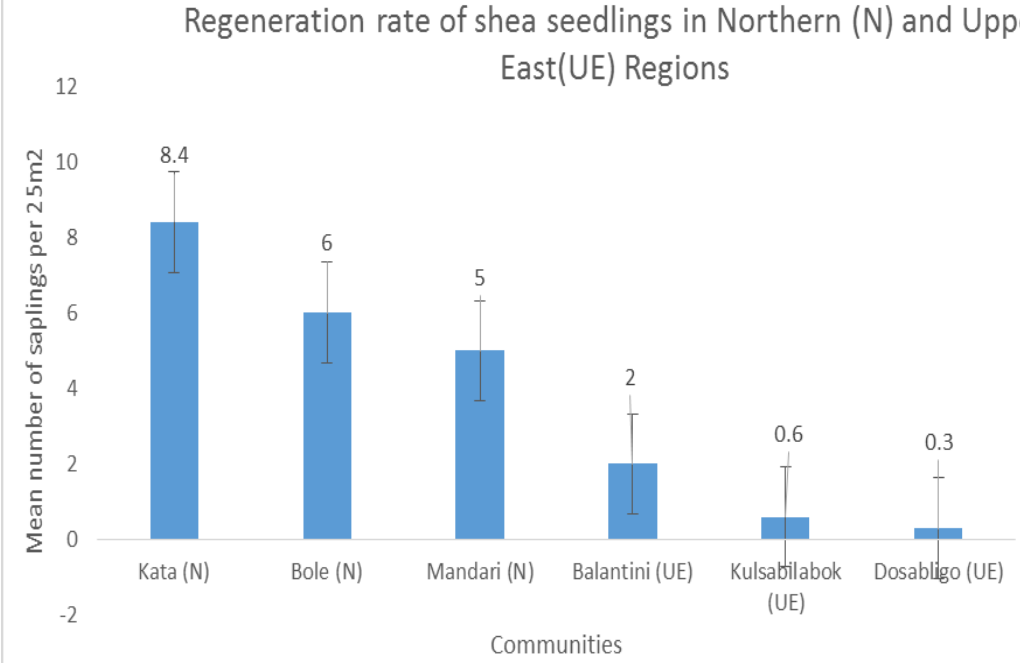

Figure 4.5 Regeneration rates of shea seedlings

Source: Field Survey (2013).

Figure 4.6 shows the density of matured shea trees in Northern and Upper East Regions of Ghana. It was realized that the shea trees are much populated at the shea growing sites in Mandari community in the Northern region and less populated in Dosabligo in the

Upper East Regions. The results indicated that for every 20m by 20m quadrat laid at the shea growing site in Mandari community, one can record an average of five (5) matured shea trees but in Dosabligo, one can record only one (1) matured shea tree. This means that the density of shea trees in Upper East Region precisely Dosabligo is very low and coupled with the regeneration rate of 0.3 seedlings per every 5m by 5m area, it means that in years to come shea trees will be very scarce in the Upper East Region and the production of shea nuts will reduce drastically. The error bars on the bar chart indicate that there is no significant difference in the density of shea trees between communities in the Northern Region but there is significant difference in the density of matured shea trees between communities in the Upper East Region. This means that the density of matured shea tree is not uniform within the Upper East Region. The low density of shea trees in some part of the Upper East Region can be attributed to the low regeneration rate of shea seedlings in the Region which is as a result of the poor soil and climatic conditions. Moore (2008) also argued that the presence of a land use cycle which involves annual ploughing and cultivation of the land contributes greatly to the poor natural regeneration of shea trees.

The high density of shea trees at the study sites in the Northern Region could mean that more shea nuts could be harvested from these areas in the Region. Therefore buyers of shea nuts in bulk could get their supplies easily in these areas in the Northern region. These findings confirm the work of Kelly *et al.* (2007), that there is decreasing shea tree density in the Sub-Saharan Africa and this is due to lack of regeneration of the shea trees.

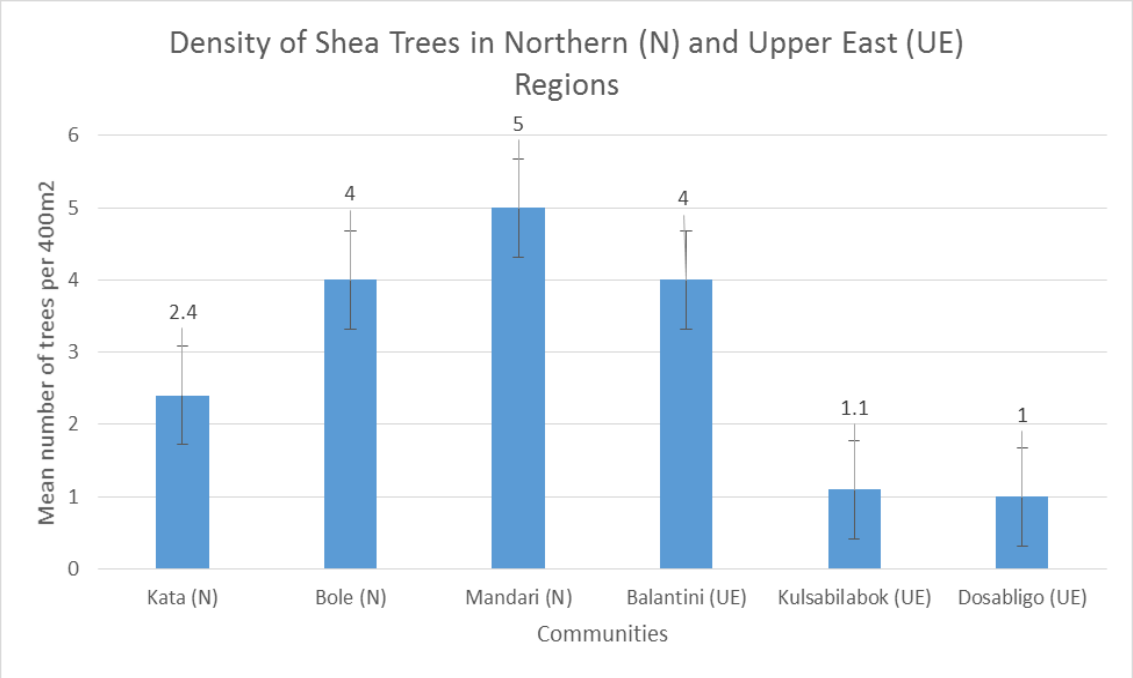

Figure 4.6 Densities of Shea Trees

Source: Field Survey (2013)

4.2.2 Quantities of Honey harvested in Northern and Upper East Regions

The research revealed that a Modified Kenyan Top bar hive which is used by all the respondents yields an average of 3.4gallons/hive/year (23.8kg) in the Northern Region and 3.2gallons/hive/year (22.4kg) in the Upper East Region. According to the respondent, it takes an average of 6 months for the honey to mature for harvesting. The highest proportion (28%) of the respondents in the Northern Region harvest 4 gallons of honey per hive per year and also in the Upper East Region 39% of the bee keepers which forms the highest proportion of the respondents also harvest 4 gallons of honey per hive per year. 21% of the bee keepers in the Northern Region harvest 5 gallons of honey per hive per year as compared 6% of the bee keepers who also harvest 5 gallons of honey

per hive per year. Similarly, Akangaamkum *et al*. (2010) reported that the average yield of honey per Kenyan top bar hive per harvest is 12kg, 10kg and 13kg for Upper East, Upper West and Northern regions respectively. However in Ethiopia, the mean yield of honey from a top bar hive is 10.66kg/hive ranging from 7kg to 18kg/hive (Tessega, 2009) whilst in Rwanda the average yield per traditional hive is 3.5 Kg which is below the average estimate of 5.6 Kg per season for Kenya Top Bar Hive (CODIT, 2009). This means that the average yield of honey per Kenyan Top Bar hive in Northern Ghana is high as compared to the yield in Rwanda and almost equal to the yield in Ethiopia.

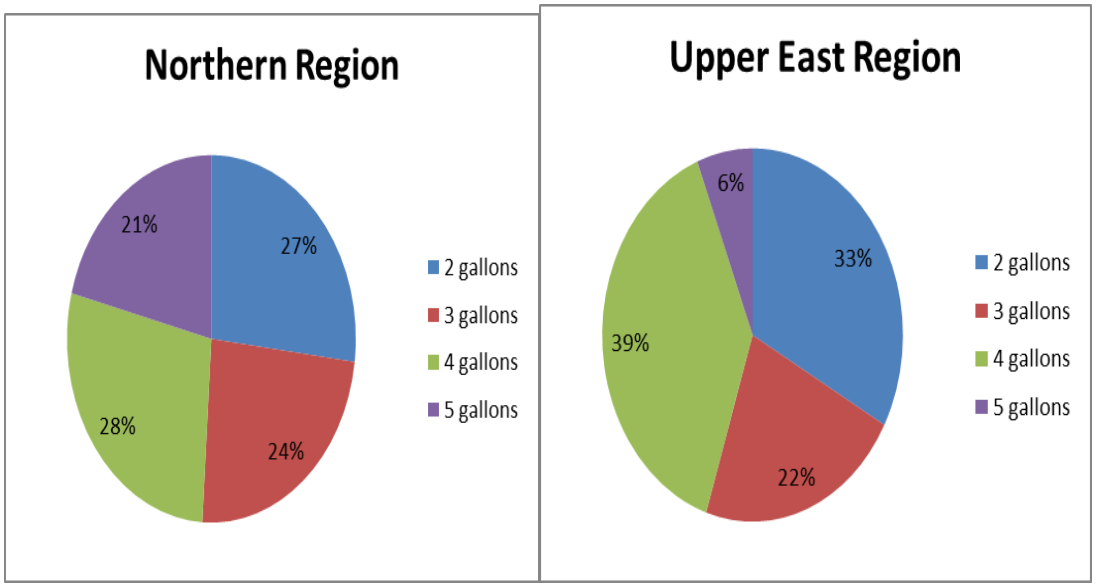

Figure 4.7 Quantities of Honey Harvested per Hive/Year

Source: Field Survey (2013).

4.3 LOCAL USES AND MARKET OPPORTUNITIES FOR SHEA AND HONEY IN NORTHERN GHANA

The following subsections provide the information on the local uses of shea and honey as well as the market opportunities that exist for shea and honey in the selected communities in the Northern and Upper East Regions of Ghana.

4.3.1 Local Uses of Shea

Figure 4.8 shows the local uses of shea and its products in the Northern and Upper East Regions of Ghana. The result shows that 38% and 52% forming the highest percentage of the responses from both Northern and Upper East Regions respectively use shea nuts for preparing shea butter. Others 28% and 26% respectively for Northern and Upper East regions respectively reported that they use the shea butter as skin and hair pomade. On the contrary, shea butter is edible and respondents from both Northern and Upper East region stated that they use it for frying food. Similarly, shea butter is reported to be used for the treatment of conditions such as bone dislocation, rheumatism, nasal inflammation and congestion, cough and leprosy by local healers (Goreja, 2004; Olaniyan and Oje, 2007). Axtell *et al.* (1993) reported that shea nut together with the oil palm serve as sources of edible oil for many homes in Sahel Africa (Njoku *et al*, 2000; Ndukwe *et al*, 2007). In the cosmetics industries, shea butter serves as a major ingredient in most formulations (Abbiw, 1990; Akihisa *et al*, 2010). Also Russo and Etherington (2001) reported that margarine, candle and soap are produced from shea.

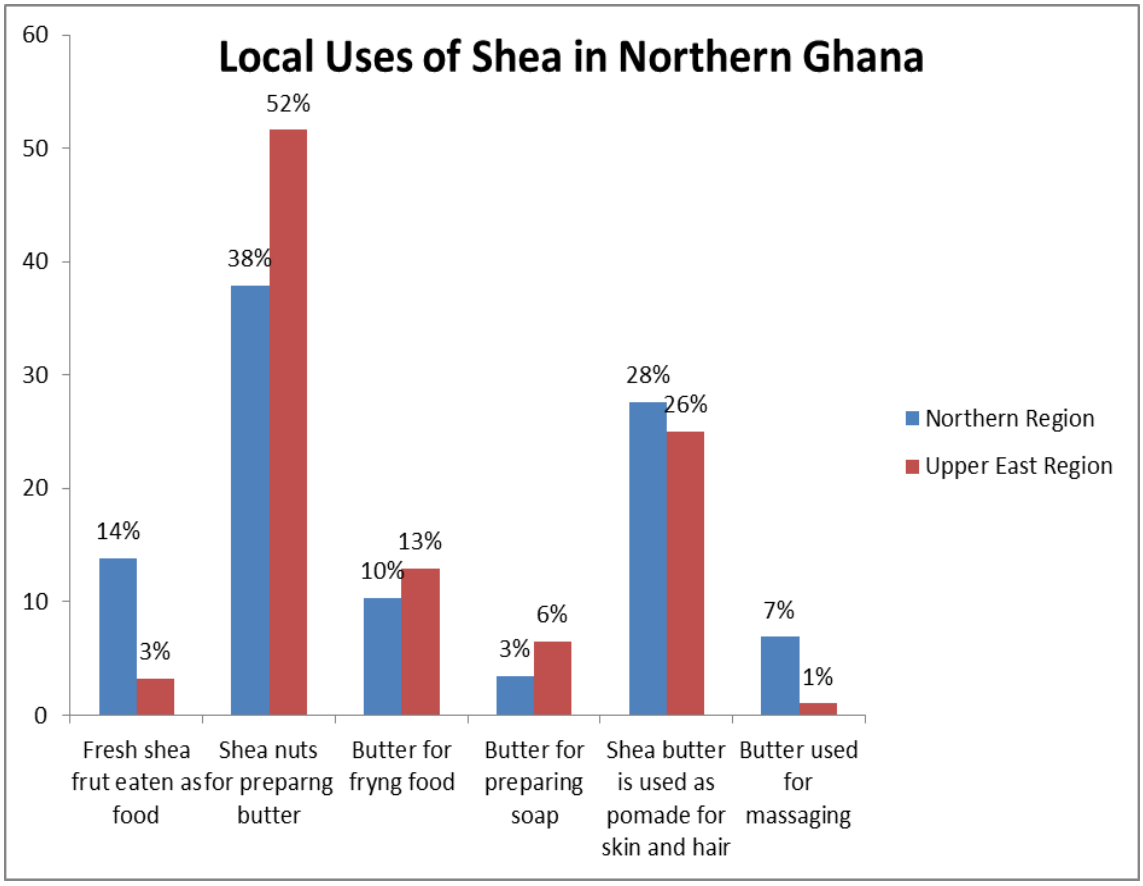

Figure 4.8 Local Uses of Shea and Shea products

Source: Field Survey (2013).

4.3.2 Market Opportunities for Shea

The study revealed that majority (78.9%) of the shea nut processors in Upper East Region store their nuts and sell later when prices are good whilst 44.4% of the processors in Northern Region sell their nuts immediately after processing (Table 4.3). To assess the market opportunities for shea in the study area, the respondents were asked for the places where they sell their honey (Table 4.4). It was realized that majority (62.5% and 57.9 %) of the respondents in Northern and Upper East Regions respectively

sell shea products at the local market within their communities. This is usually done on the market days in the community during which the nearby villages come to buy and sell. Others sell their shea products at markets in nearby communities or towns. They visit these markets at days set aside as market days in those communities just as others come to their communities on market days to buy shea. Eskola (2005) reported that 'even though larger markets would be accessible to local market traders, social benefits at the local market outweigh the modest economic benefit of engaging with the regional market'. This explains why majority of the shea producers prefer to sell their products at the local market to larger markets outside their communities.

Table 4.3 Time of Selling of Shea nuts

Time of selling of shea nuts	Northern Region (%)	Upper East Region (%)
Immediately after processing	44.4	10.5
Stored and sold later	25.9	78.9
Sold part immediately and the remaining later	29.6	10.5

Source: Field Survey (2013)

Table 4.4 Market sites for shea nuts

Place of Market for shea nuts	Northern Region (%)	Upper East Region (%)
Market in community	62.5	57.9
Market in nearby community or town	37.5	42.1

Source: Field Survey (2013)

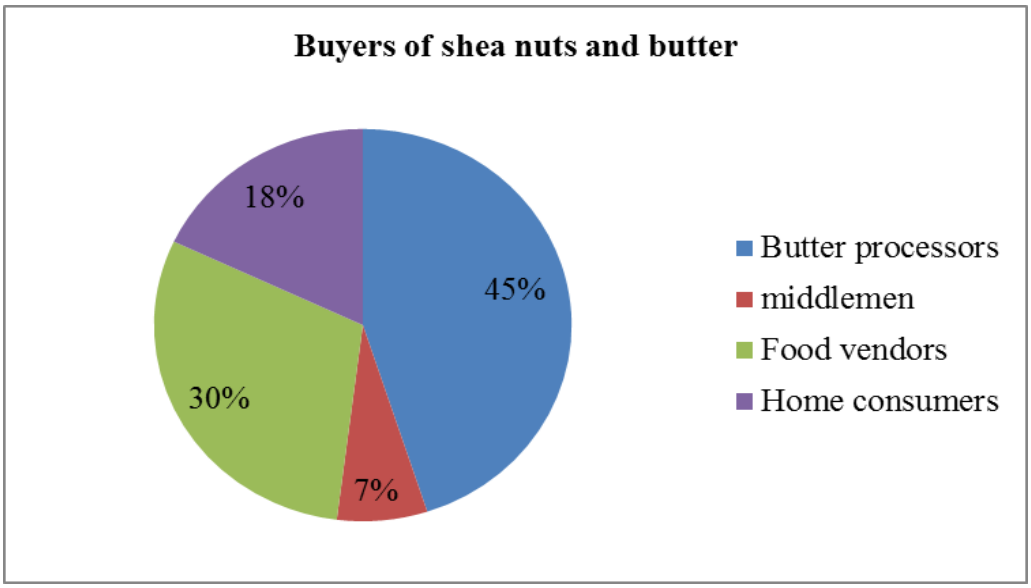

Figure 4.9 Buyer of Shea nuts and butter

Source: Field Survey (2013)

The study also identified the buyers of shea in these markets (Figure 4.9). It was realized that majority (45%) of the buyers of shea nuts are the butter processors who buy the nuts

and further process into butter for sale. The other buyers of the shea nuts and butter included the middlemen, food vendors and home consumers.

The study further assessed market access and pricing of shea products in Northern and Upper East region and the result shows that majority of the processors in Upper East Region decide the price they want to sell their nuts and butter to the buyers. Meanwhile in Northern Region pricing of shea and nuts is determined mainly by the buyers who make an offer to the processor to accept or reject (Table 4.5).

Table 4.5 Pricing of Shea Products

Region / Pricing of Shea Products	I decide	Buyer makes an offer	Total
Northern	4	25	29
Upper East	23	8	31
Total	27	33	60

Source: Field Survey (2013).

The study further analysed whether the shea processors accept the offer made by the buyers in buying their shea products. Table 4.6 shows the cross-classify of Region of respondents to determination of prices and whether buyers accept the prices offered to them. Out of the 25 respondents in Northern region whose shea nuts and butter prices were determined by the buyers, 21 accept the offer even if the price is low and 4 do not accept the offer. However, out of the 8 respondents in Upper East region whose shea

nuts and butter prices were determined by the buyers, 6 accept the offer even if the price is low and 2 do not accept the offer. According to the respondents, they accept the offer because there are no alternative means to sell their products and also they may be in need of money urgently.

Table 4.6 Acceptance of Price Offer by Shea processors

Region / Acceptance of price offer			Number of Respondents
Yes	Region of Respondents	Northern	21
		Upper East	6
	Total		27
No	Region of Respondents	Northern	4
		Upper East	2
	Total		6

Source: Field Survey (2013)

4.3.3 Local Uses of Honey and Its By-Products

Figure 4.10 shows the local uses of honey in Northern and Upper East Regions of Ghana. The study revealed several uses of honey which can be categorized into medicinal purposes, food and as bait for new hives. The highest number of responses from both Northern (35%) and Upper East (38%) Regions indicated that honey is used

for the treatment of cough. Honey is also used for food (sugar substitute) by both respondents in Northern (15%) and Upper East (14%) Regions. They usually add it to their beverages for taste or as a substitute for sugar. Others use it as food for babies with the belief that it improves the intelligence levels of babies. Honey has medicinal values and respondent in both Northern and Upper East Regions reported to use honey for the treatment of skin burns, scars, boils, convulsion, fractured bone, cough, heart burns and hard palms. Bee keepers also use the bee wax from the honey to bait new hives in order to colonize their new hives. According to the bee keepers, the bee wax attracts stray bee colonies easily into new hives. These findings confirm the uses of honey as reported by several researches. Joshi (2008) reported that honey is used as a substitute for sugar where sugar is not easily available. Also honey is consumed directly or used in pastries and sweets (Joshi, 2008). Medical uses of honey have been reported by several authors (Eteraf-Oskouei and Najafi, 2013; Joshi, 2008; Ezz El-Arab *et al*, 2006; Bansal *et al*, 2005).

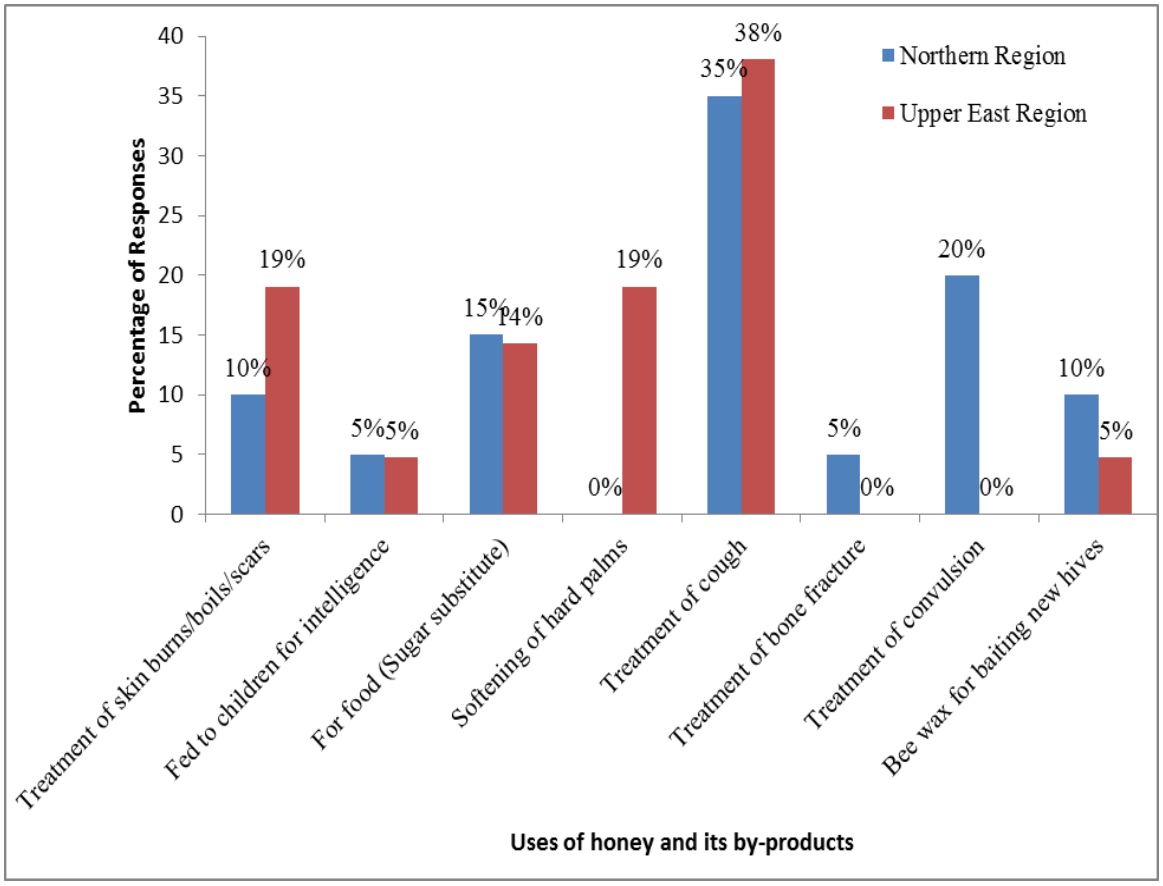

Figure 4.10 Local uses of honey and its by-products

Source: Field Survey (2013)

4.3.4 Market Opportunities for Honey

To assess the market opportunities for honey in the study area, the respondents were asked for the places where they sell their honey (Table 4.7). It was realized that majority (57.7%) of the respondent in Upper East Region sell honey at the market within their communities. This is usually done on the market days in the community during which the nearby villages come to buy and sell on that day. However, higher numbers (41.4%) of the respondents in Northern Region sell their honey at market in nearby towns. They

visit these markets at days set aside as market days in those communities just as others come to their communities on market days to buy honey. Other bee keepers have established contact with buyers and as such these buyers visit them at home to buy the honey whenever they harvest. The result shows that 24.1 % of the respondents in Northern Region sell their honey at home as compared to 7.7% of the respondents in Upper East Region. Eskola (2005) reported that local market traders prefer local market to larger accessible markets because of the social benefits at these local market which they think outweigh the economic benefits at the regional market. This may explain why majority of the bee keepers in Upper East prefer to sell their honey at the local market to larger markets outside their communities.

Table 4.7 Market Sites For honey

Place of Market for Honey	Northern Region (%)	Upper East Region (%)
Market in community	34.5	57.7
Home	24.1	7.7
Market in nearby community or town	41.4	34.6

Source: Field Survey (2013)

The study also identified the category of buyers of honey in the above mentioned markets. From figure 4.11, it was realized that majority (48%) of the buyers are Middlemen who buy the honey in bulk from the producers and transport it to cities and sell it in bulk to retailers. Retailers also buy directly from the bee keepers. It was realized that 27% of the buyers were retailers who buy in bulk from the producers and

sell it in small quantities to final consumers. Individual consumers also buy directly from the producers for their home consumption and they form 25% of the buyers.

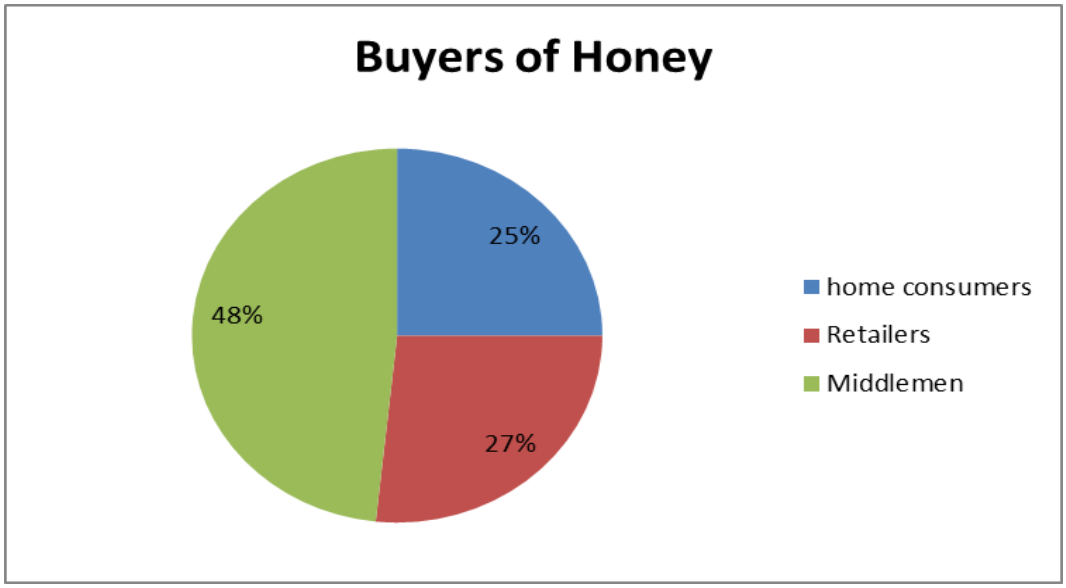

Figure 4.11 Buyers of Honey

Source: Field Survey (2013)

The study further assessed the market access and pricing of honey in the study communities. Table 4.8 shows the cross tabulation between region of respondents and availability of ready market for their products.

Table 4.8 Market access for honey

Region/Ready market for honey	Yes	No	Total
Northern	9	25	34
Upper East Region	15	11	26
Total	24	36	60

Source: Field Survey (2013).

Table 4.8 shows the cross tabulation between the region of the respondent and access to market for their honey. Comparing the values from the cross tabulation, it shows that bee keepers at the study areas in Upper East region have more ready market for their honey as compared to the bee keepers at the study areas in the Northern region. However the cross tabulation above did not give information about whether the honey producers in Upper East had the prices they actually wanted. The researcher further cross-classified the cross tabulation above (table 4.8) with "Do you always get the price you want?" as shown in table 4.9.

Table 4.9 Pricing of honey and Access to market

Do you always get the price you want?			Do you have ready market for your honey?		Total
			Yes	No	
Yes	Region of Respondents	Northern	4	7	11
		Upper East	12	3	15
	Total		16	10	26
No	Region of Respondents	Northern	5	18	23
		Upper East	1	7	8
	Total		6	25	31

Source: Field Survey (2013)

It can be seen from table 4.9 that those who had ready market for honey and also had the price they actually wanted in Upper East region are more as compared to the Northern

region. This situation was particularly realized in Tuna community in Northern region where the women honey producers had over 40 gallons of honey with no buyers. Some of the buyers would always want to offer a price far below the prices the producers want to sell the honey. This is because the wild honey harvesters who use fire to harvest their honey sell at a cheaper price as compared to this group of bee keepers who do not use fire and thus produce a high quality honey. According to Lynch (1994), supply chains are centred on the contacts with the people as well as knowledge of the people involved in the trading and not infrastructural development like roads and buildings. This explains why majority of the producers do not have ready markets for their products. It could mean that honey producers in Northern region have not established contact with buyers and also do not have adequate knowledge about the possible avenues to sell their products, hence the lack of ready market for their products.

4.4 CONSERVATION PRACTICES TO ENSURE THE SUSTAINABLE HARVEST OF SHEA AND HONEY IN NORTHERN GHANA

The following subsections provide the findings on the local conservation practices carried out in the study communities to ensure the sustainable harvest of shea and honey.

4.4.1 Local Conservation Practices for Sustainable Harvest of Shea Fruits

Figure 4.12 shows the local conservation practices instituted by the study communities in Northern Ghana to ensure the sustainable harvest of shea fruits. The communities have instituted several by-laws/regulations to regulate the use of the shea fruits. Majority (38%) of the responses from the Northern Region indicates that community members are

not allowed to cut down shea trees for charcoal or fire wood. Similarly, majority (36%) of the responses from the Upper East also indicates that community members are not allowed to burn shea trees on farmlands even if the land belongs to them. This could be attributed to the fact that shea trees do not only produce shea nuts but also improve the conditions of the soil for crop growth. According to Teklehaimanot (2004), shea trees on crop lands can improve soil conditions thereby contributing to crop growth. Also a study by Boffa (2000) showed that soil physical conditions and fertility were better near to the shea trees than far from the shea trees. Furthermore, Djossa *et al*. (2008) reported that traditionally shea trees are maintained during land preparation for cultivation to enhance high yield. Certain conservation measures were only observed in Northern region and they include; No collection of shea nuts on Mondays and Fridays (17%), Closed and opened season for shea fruits collection (14%) (this was observed in Bole and Mandari where community members were not allowed to collect the shea fruits before the annual rites are performed by the shea priest) and closed and opened season for the burning (7%). Similarly, some conservation measures were only observed in Upper East region and they include: weed control by controlled burning around shea trees (13%) and no bush burning in and around a community (6%).

Others have some agronomic practices to ensure high yield of the shea trees, these include pruning of smaller shea trees and weed control. These regulations are instituted by the chiefs and the opinion leaders in consultation with members of the communities. The by-laws are therefore strictly enforced by the communities and the culprits are punished accordingly. For example a woman in Mandari was punished because someone

cut a shea tree on her farmland. Also another woman was caught collecting shea fruits before the opened season and she was made to pay a fine. Carette *et al*., (2009) reported that village chiefs and earth priests in Northern Ghana discourage the cutting down of shea trees and gave an instance in Jirapa in the Upper West Region where people who cut shea trees on their own land are arrested and fined. It is believed by the people that if one collects shea fruits prior to the performance of the rites, the person may be bitten by a snake.

Although several communities have instituted conservation measures to help protect the shea trees, enforcement of these regulations is another issue of concern; the researcher observed on the field that shea trees are cut on the field for charcoal and fuel wood. Also others do burn the shea trees on their farms in some of the communities.

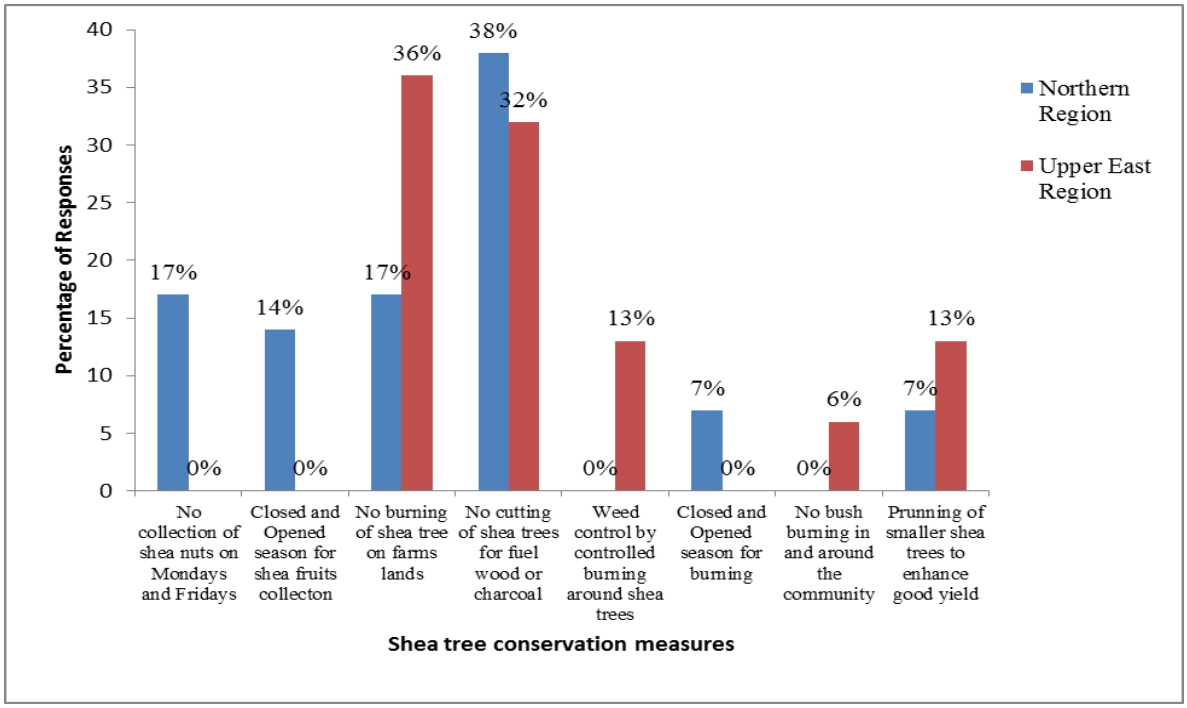

Figure 4.12 Local conservation practices for sustainable harvest of shea fruits

Source: Field Survey (2013)

Plate 1: Shea tree branches cut for fuel wood

Plate 2: Burnt shea trees

4.4.2 Local Conservation Practices for Sustainable Harvest of Honey

Figure 4.13 shows the local conservation measures instituted by the study communities in Northern and Upper East Region to ensure the protection of bees and sustainable production of honey. In Northern Region, creation of fire belts around apiary was the most frequent (24%) response from the bee keepers while in the Upper East region, weeding in and around the apiary was the most frequent (21%) response.

Closed and opened season for burning are also observed in some communities in both Northern and Upper East Regions, 22% of the responses from the Northern Region indicated that they observed closed and opened season for burning while 13% of the responses from Upper East Region indicated the observation of closed and opened season for burning. Closed season for burning is observed during the dry season when atmospheric temperature is high and humidity is low. During which time severe bush fires occur easily with the little flame.

Wild harvesting of honey using naked fire is not allowed in some communities of the Northern and Upper East Regions. It is believed that harvesting wild honey using naked fire results in killing many bees in the process and subsequently causes the bees to abandon their hives. Also harvesting of honey is not allowed when shea trees are flowering in some parts of both Northern (7%) and Upper East (11%) Regions. According to the respondents, honey is not matured at that period of the year and that the bees will then be gathering nectar to produce more honey. They also explained that the bees help in pollinating the shea flowers to enhance more yield. Therefore harvesting

honey during that period could force the bees to leave the area, which could subsequently affect the shea fruit yield. Alieu (2010) reported that traditional conservation practices can be irreplaceable in ensuring effective utilisation of natural resources. Hence it is believe that these practices instituted by these communities could help ensure the sustainable production of honey in these communities. Similarly Endalamaw (2008), reported that beekeepers in Ethiopia invest to the conservation of beekeeping trees known as the "Kobo trees' as these trees help bees to colonize and produce honey.

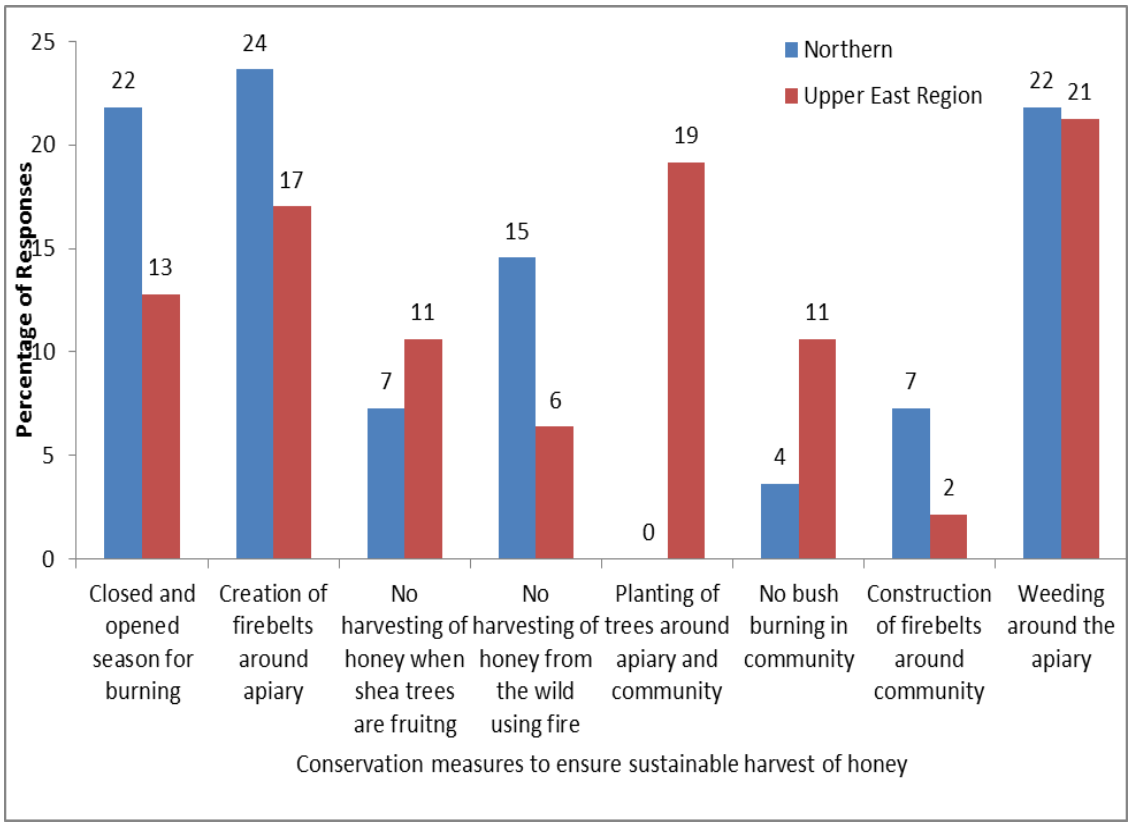

Figure 4.13 Local Conservation Practices for Sustainable Harvest of Honey

Source: Field Survey (2013)

4.5 SHEA AND HONEY VALUE CHAINS CURRENTLY IN OPERATION

The following subsections provide information on the current value chain mapping of shea and honey in Northern Ghana. It provides information on the actors in the value chain as well as their roles in the value chain.

4.5.1 Shea Value Chain Map in Northern Ghana

The shea value chain involves different actors. The main actors in the value chain include shea fruit collectors, nut processors, shea nut bulkers, butter processors, local cosmetics manufacturers, Food vendors, Consumers.

The downstream part of the shea value chain starts from the collectors in local communities in Northern Ghana as shown in figure 4.14 below. The collectors process the fruits into dry shea nuts and sell it to shea nut bulkers and butter processors in the rural market where the buyer incurs transaction cost and in urban market where collectors incur transaction cost because collectors have to incur transportation cost to the market. The functional roles of different actors/participants in bringing a product from the wild to the end point of the value chain are discussed below.

Pickers

The first stage of the shea value chain in Northern Ghana is the shea fruit picking. The picking of shea fruits starts in April/May in the Northern region and May/June in the Upper East region till September. The pickers start picking as early as 4:30am to avoid competition with other pickers for the fruit as reported by some respondents. The shea fruits are picked mostly by women. The few men who collect shea fruits do it solely on

their farm land on their visit to the farm. Similarly Elias and Carney (2007) reported that traditionally, shea nut picking and butter processing are done by women. The shea fruits are picked from the wild and farmland. The picking from the wild is opened to every member of the community but picking from farmlands is restricted to the farm owners. Majority of the pickers collect shea fruits which have fallen from the trees whilst others use sticks to plug the fruits from the tree. The pulp of the fruit is removed in the wild or the farm to reduce the weight of their load before transporting it home. The pulp is eaten as food and is sold on the market as fruit. The pickers travel as long as 5-10 kilometres to collect shea fruits as stated by the respondents. They cover this distance by foot and carry a heavy load of shea fruits back home. Similar findings were reported by Derks and Lusby (2006) in Mali and Carette *et al*. (2009) in Ghana.

Plate 3: Shea fruits picking at Mandari

Plate 4: Transportation of shea fruits by women at Bole.

Nut processors

The shea fruits are further processed into nuts. The processing involves parboiling of the nuts, drying of the parboiled nuts and cracking of the nuts. Parboiling the nuts is done immediately they are transported home. This prevents the nuts from germinating and also improves the taste of the oil that will be produced. The nuts are dried after parboiling in an open space to enhance easy removal of shells and also reduce the moisture content of the nuts. Shell covering the shea kernel is removed by cracking with a stone. This activity is very time consuming as it is done manually by the shea butter producers. The nuts are subsequently dried to prevent it from growing moldy and extend the storage life. These findings are similarly to the findings of Carette *et al*. (2009), that boiling of nuts are usually done to prevent germination but however stated that prolong boiling will destroy the needed natural compounds in the kernel.

Plate 5: Shea nut processor parboiling shea fruits at Mandari

Plate 6: Researcher drying parboiled shea nuts at Mandari.

Shea nut bulkers

The processed shea nuts are either sold immediately or stored and sold later. The shea nut bulkers buy the shea nuts directly from the collectors or at the local markets during the market days. They do this during the harvest period when the prices of the shea nuts are lower. They buy the nuts from different market centres during market days. The bulked nuts are sold to bulk butter processors or nuts exporters later in the year when shea nut prices are higher. Derks and Lusby (2006) reported that Collectors in Mali buy direct from women producers mostly during weekly markets and consolidators purchase during designated market days and they also supervise the activities of the collectors.

Butter processors

The butter processors either process shea nuts they collected from the field or they buy nuts and process. The process involved in the shea butter processing include crushing of the kernel into grits, roasting of the grits to aid the oil extraction, and milling into a paste. The paste is mixed with water and kneaded to capture the fat in an emulsion. The mixture is boiled to separate the fat from the water. The liquid fat on the surface of the boiling mixture is fetched with a calabash or a big spoon and cooled to produce the solid shea butter.

Local cosmetics manufacturers

Local cosmetics manufacturers process the shea nuts into shea butter cream for the body and hair. They also process the shea butter into local soap for bathing and washing.

Food vendors

Food vendors use the shea butter to prepare food for sale. They use the shea butter as cooking oil to substitute the expensive cooking oils on the market. The oil is used for frying food, frying meat and preparing stew.

Consumers

The consumers are the end users of the shea products. They use products such as the raw shea fruits, shea butter oil, shea butter soap, shea butter body and hair cream. According to some of the consumers, they prefer using the shea products because the taste is more natural and organic.

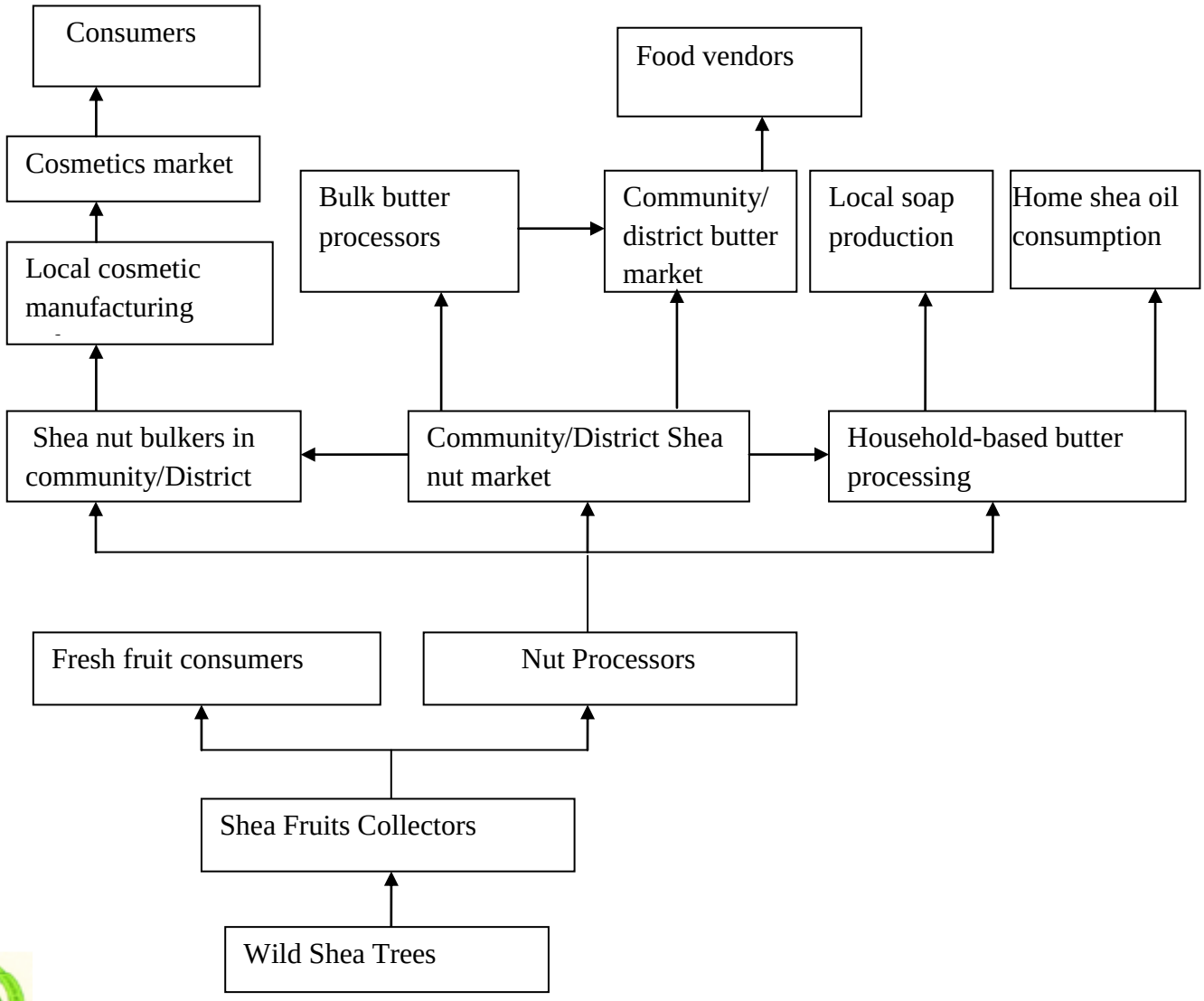

Figure 4.14: Shea Value Chain Map

Source: Field Survey (2013)

4.5.2 Honey Value Chain Map in Northern Ghana

They honey value chain consist of different actors as depicted by figure 4.15 below. The main actors in the value chain include: input suppliers, honey producers (bee keepers

and wild honey harvesters), harvesters, honey extractors, wax extractors, retailers and the consumers.

Input suppliers

In Northern Ghana, the input suppliers in the bee keeping industry produce bee hives and bee keeping equipment such as bee suits, veils, smokers, swarm catcher, honey extractor, boots, gloves and bee brush. The type of hive mostly produced is the Modified Kenyan Top bar hive. These hives are produced by highly skilled carpenters in the regional capitals and also from the southern part of Ghana where they can have access to quality wood. As at the time of the data collection in 2013, a hive costs about GH¢ 120 with other bee keeping equipment. Similarly, Kilimo (2012) reported that in Uganda, input suppliers supply inputs like beehives (Kenyan Top Bar and Langstroth), bee suits, honey extractors, air-tight buckets, smokers and gloves. However, CODIT (2009), reported that many beekeepers still use traditional hives despite the high level of consciousness about the potential of using modern hives. This is probably due to the high costs of acquisition associated with the modern hives as a complete modern Langstroth hive with other bee keeper equipment was found to cost approximately US$ 45 – 63 (CODIT, 2009).

Producers

The producers in the bee keeping industries are the bee keepers and the wild honey harvesters. The bee keepers have several hives arranged at a suitable place called the apiary. The producers select the site for their apiary based on conditions such as

availability of flowering plants and site free from human and livestock disturbances. In the study area, each producer owns between 1-6 hives. The colonization of the hive by the bees takes between 1 week to as long as 12 months depending on the baiting material and the suitability of the hive to the colony of bees. The bee keepers carry out certain apiary management practices such as weeding, bush fire control, pest control and water supply. However, Kilimo (2012) reported that the majority of beekeepers in Uganda are small scale producers who mostly use traditional hives and maintain their bee colonies through indigenous management practices. Also in Uganda the average number of hives owned per bee keeper is 28 hives.

Plate 7: An apiary at Seripe community, Bole district.

Harvesters

In Northern Ghana harvesting of honey is done either from the wild or from bee hives kept by bee keepers. Traditionally honey is harvested from natural beehives, usually found in the hollow cavities of trees. Harvesting from wild beehives is solely done by men. The harvesting season begins after the shea trees flower. This is to ensure the bees get a chance to collect their nectar. The harvesting of honey from the bee hives kept by bee keepers is done when there are more and aggressive bees in the hives' immediate vicinity. The bees are calmed and distanced by the smoke from the smoker before harvesting begins. The bee keepers double as the harvesters in most cases except for female bee keepers who do not have adequate skills to do the harvesting.

Honey extractors

Extraction of honey from the combs takes place immediately after harvesting from the hive. It is done away from the hive to prevent attack by the bees. The honey extractors in Northern Ghana use either solar extractors or manual hand press to extract honey from the combs. After extracting of the honey, the honey is packaged in recycled plastic containers or new plastic containers for storage or sale to buyers. Similarly, Kilimo (2010) reported that producers and small scale traders carry out primary processing, bottling and sell directly to final consumers and other buyers. In Rwanda, users of log hives and Kenyan Top bar hives carry out semi-processing during honey extraction from combs. This is usually done using the self-drip method. However for improved KTBH and Langstroth, the producers use spoons to squeeze honey from combs (CODIT, 2009).

Wax extractors

Few of the honey producers extract wax from the comb. The wax is extracted from the residual comb after extraction of the honey. The extraction process involves boiling of the residual comb on fire and the wax is tapped from the surface of the boiling water upon cooling. Majority of the bee keepers do not extract bee wax because they claimed there is no market for it. Those who extract the wax use it for baiting new hives. Similarly, Fichtl and Admasu (1994) reported that several regions in Ethiopia do not collect bee wax because it is of little practical value to the bee keepers.

Plate 8: Bee wax extracted by a bee keeper at Seripe, Bole district

Retailers

The retailers buy the honey directly from the bee keepers. They usually go to the communities on the market days and buy it from the producers. They buy the honey in bulk and repackage it into smaller quantities for sale to the final consumers. The role of the retailers in the value chain is to ensure that the honey gets to final consumers both in

the villages and the cities. Hence they incur the cost of transporting the product from the production centres to the consumers. According to the producers, the retailers are the major source of market for the honey they produce. Akangaamkum *et al*. (2010) reported that retailers in Ghana are typically local women who trade in honey as well as other products. However, the producers and processors at certain times retail directly to the consumers.

Consumers

The consumers are the end users of the honey. They use the honey for food and as medicine. They buy the honey from the retailers in city markets and supermarkets. Few of the consumers buy the honey directly from the producers. In Rwanda, the end markets for honey encompass the final consumers. These include but are not limited to domestic consumers and industries that use honey as a table food and food processing or preservation agent respectively (CODIT, 2009). Also in Ghana, individual consumers are the key final users of honey and its products (Akangaamkum *et al*., 2010).

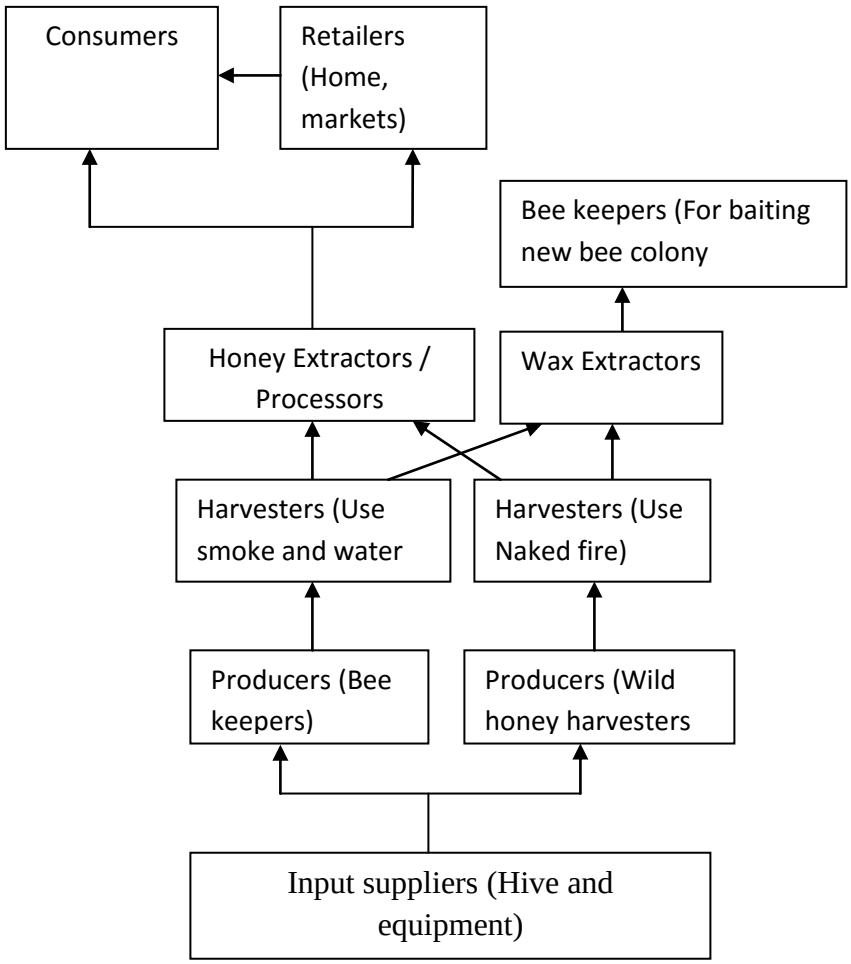

Figure 4.15 Honey Value Chain Map

Source: Field Survey (2013)

4.6 CONSTRAINTS OF SHEA AND HONEY VALUE CHAIN DEVELOPMENT IN NORTHERN GHANA

The following subsections provide information on the constraints facing the shea fruits pickers and processors as well as the bee keepers and honey marketers in Northern Ghana.

4.6.1 Constraints Facing Shea Fruit Pickers and Processors

The picking of shea fruits starts in April/May in the Northern region and May/June in the Upper East region till September. The shea fruits are collected from the wild and farmland. Shea fruits pickers are faced with numerous constraints as shown in figure 4.16 below. Majority of the responses from both Northern (47%) and Upper East (44%) Region indicated long distances covered to pick shea nuts as a major problem. According to the pickers, they could cover a distance of between 5-10 kilometres to collect shea fruits. They cover this distance by foot and carry a heavy load of shea fruits back home.

Snake bites during shea fruits picking is also another serious constraint reported by both respondents in Northern (31%) and Upper East (33%) Regions. According to the respondents, the snakes hide in the bush under the shea trees and bite in case anybody accidentally steps on them. The shea fruit collectors do not wear any protective clothing when collecting shea fruits in the wild. This contributes to the occurrence of snake and scorpion bites. This confirms the work of Carette *et al*. (2009) that scorpions or snakes bites are some of the constraints encountered by shea fruits collectors in Northern

Ghana. Fulani herdsmen attack was exceptional case in Northern Region. 7% of the responses from the Northern Region mainly women, indicated that Fulani herdsmen attack and harass them sexually during shea nut picking from the wild. Other constraints include scorpion bites and bee attacks.

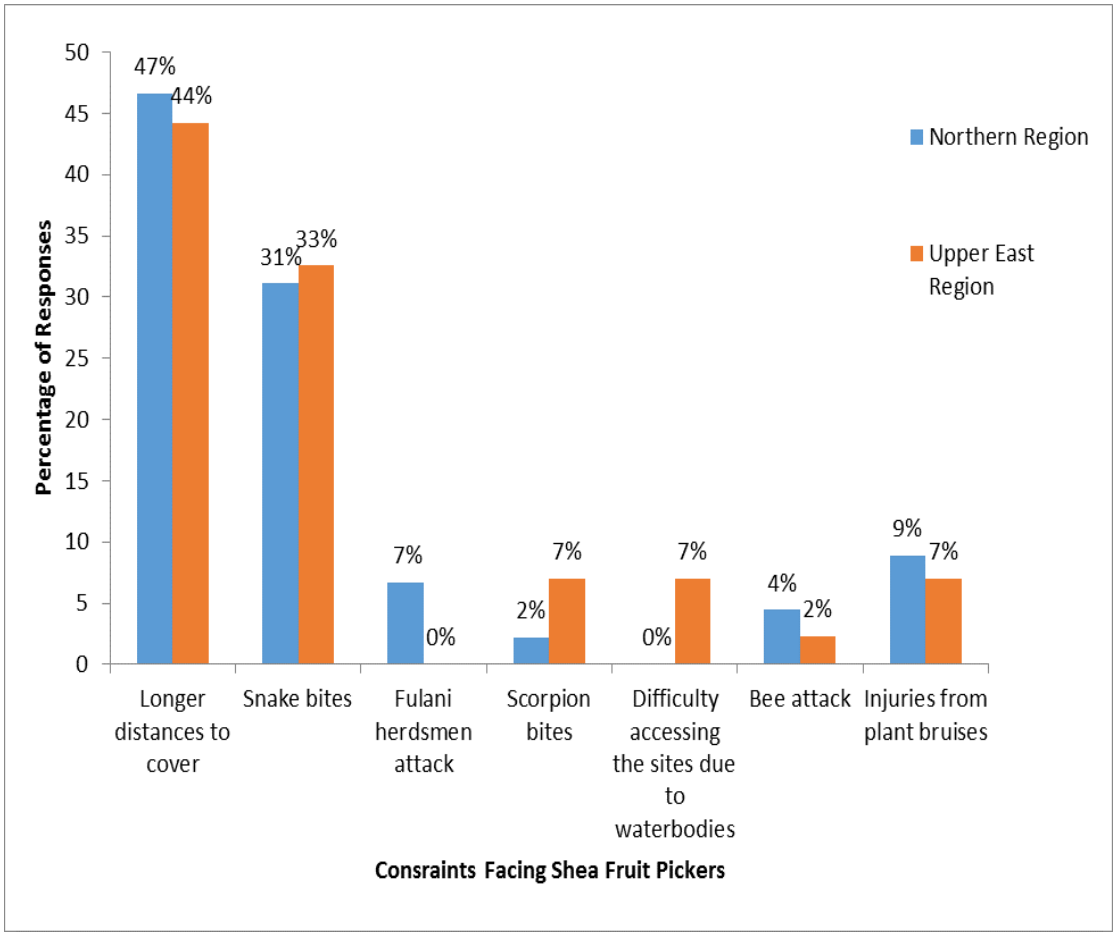

Figure 4.16 Constraints Facing Shea Fruit Pickers

Source: Field Survey (2013)

The shea fruits collected are processed either into shea nuts or butter. The shea nuts and butter processors also have some challenges in their production (figure 4.17). The majority of the responses (52% from Northern Region as well as the Upper East Region (38%)) indicated no ready market and market linkage for shea nuts and butter as a major

problem encountered by the shea nuts and butter processors. According to the processors, they could process larger quantities of shea nuts and butter but getting buyers becomes a challenge. In situations where they get buyers, they are often offered poor prices as indicated by 40% of the responses from Northern Region and 4% from the Upper East Region. This happens especially during the harvesting season for shea. This is in line with the work of Carette *et al*. (2009), who reported that the prices of shea nuts are very low in Northern Ghana especially during the harvest season. Therefore nut processors are compelled to sell them at lower prices because they need money to buy food for their families and meet other needs.

Others who wish to store their nuts to gain good price later in the season encounter storage problem as indicated by 4% of the responses from the Northern Region and 8% of the responses from the Upper East Region. They do not have access to good storage facilities for their nuts. They end up losing their nuts to mould and storage pest. This situation most of the time compel them to sell their nuts early to avoid storage losses.

Others have difficulty accessing grinding mills and other processing materials. The situation was only recorded in some of the study communities in the Upper East Region and constituted 25% of the responses from the Region. It was realised that grinding mills were not available in their communities so they always transport their shea kernels to any nearby grinding mill, this at the end adds up to their production cost which subsequently reduces their profit margin. Furthermore, due to the difficulty in accessing grinding mills, some of the butter producers resort to grinding their nuts on a flat stone

surface with a grinding stone. This method is known to reduce the quality and quantity of butter obtained as reported by Carette *et al.* (2009), that machine extraction of the shea butter yields more than the manual extraction.

Accessing transport to district or regional markets was also one the challenges the shea nuts and butter producers encounter. According to them, their communities are located far from the main roads networks to the district market, so getting a vehicle to the market becomes difficult. They could only access transport to the market during major market days. This situation compels them to sell their nuts and butter at lower prices at the local market or to the bulk shea nuts and butter buyers in the community.

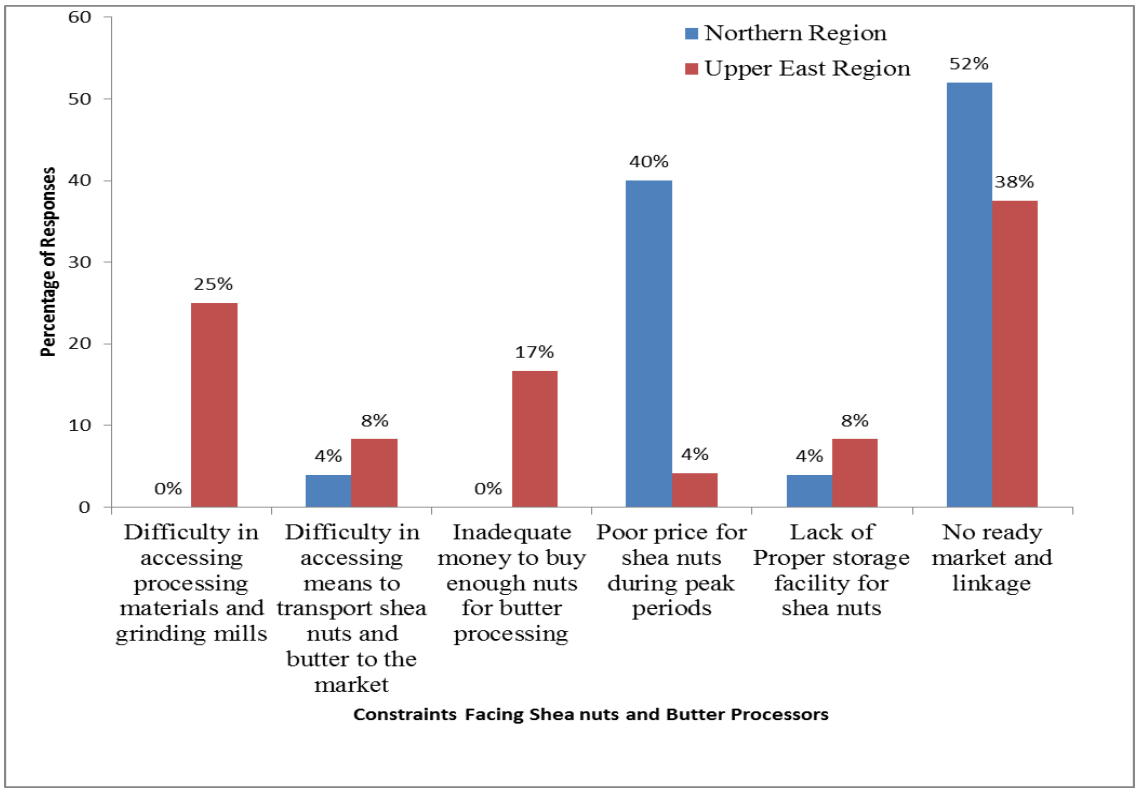

Figure 4.17 Constraints Facing Shea nuts and butter producers

Source: Field Survey (2013)

4.6.2 Constraints Facing Bee Keepers and Honey Marketers

The bee keepers in the study communities use the Modified Kenyan Top bar hives. The number of hives owned by each producer ranges between 1 and 6. The colonization of the hives by the bees could take between 1week to 3 months depending on the baiting material and the suitability of the hive to the bees. The bee keepers and the honey marketers in the study communities are faced with several challenges as shown in figures 4.18 and 4.19 respectively.

In Northern Region bee absconding (35%) and bee attack on keepers (35%) formed the majority of the responses from the region while lack of finance to purchase more hives formed the majority (31%) of the responses from the Upper East Region. According to the bee keepers, the bees usually abandon the hives a few days or a week after colonization and never return or return at a later time. According to the bee keepers, the absconding is usually caused by ants attack on the bees or pushing down of the hives by cattle. Bee farmers in Botswana also experience absconding of colonies and attributed it to invasion by ants and hive beetles, animal and disturbance (Total Transformation Agribusiness Ltd, 2006).

Some of the bee keepers in the Upper East Region hang their hives on trees. Difficulty in hanging these hives on the trees is among the problems encounter by bee keepers in the Upper East region especially women and formed 13% of the responses from the region. This problem was reported by only the bee keepers in the Upper East. According to them the hives are heavy and therefore find it difficult to climb a tree with it.

Pest attacks on the bees are also another major problem encountered by the bee keepers in the study communities. The pests include ants and lizards; the ants and lizards were common with bee hives hanged on trees. In Northern Region, lizards attack on bees formed 13% of the responses while in the Upper East Region it formed 6% of the responses. Also stealing of honey by ants was reported more in the Northern Region (11%) as compared to other Upper East Region (6%).

Others complained of theft of honey by people. According to the respondents, these thieves use fire to burn the bees and steal the honey at night. Others set fire into the dry bush to burn the apiary and kill the bees. This problem was reported more in the Upper East Region (13%) than the Northern Region (4%). These problems encountered by bee keepers in Northern Ghana are in line with the findings of Ayalew (2001), which stated that the major constraints in the beekeeping sub sector in Ethiopia include the unpleasant behaviours of bees such as aggressiveness, swarming tendency, and absconding. Also drought and deforestation of natural vegetation and honeybee disease, pests and predators are also common.

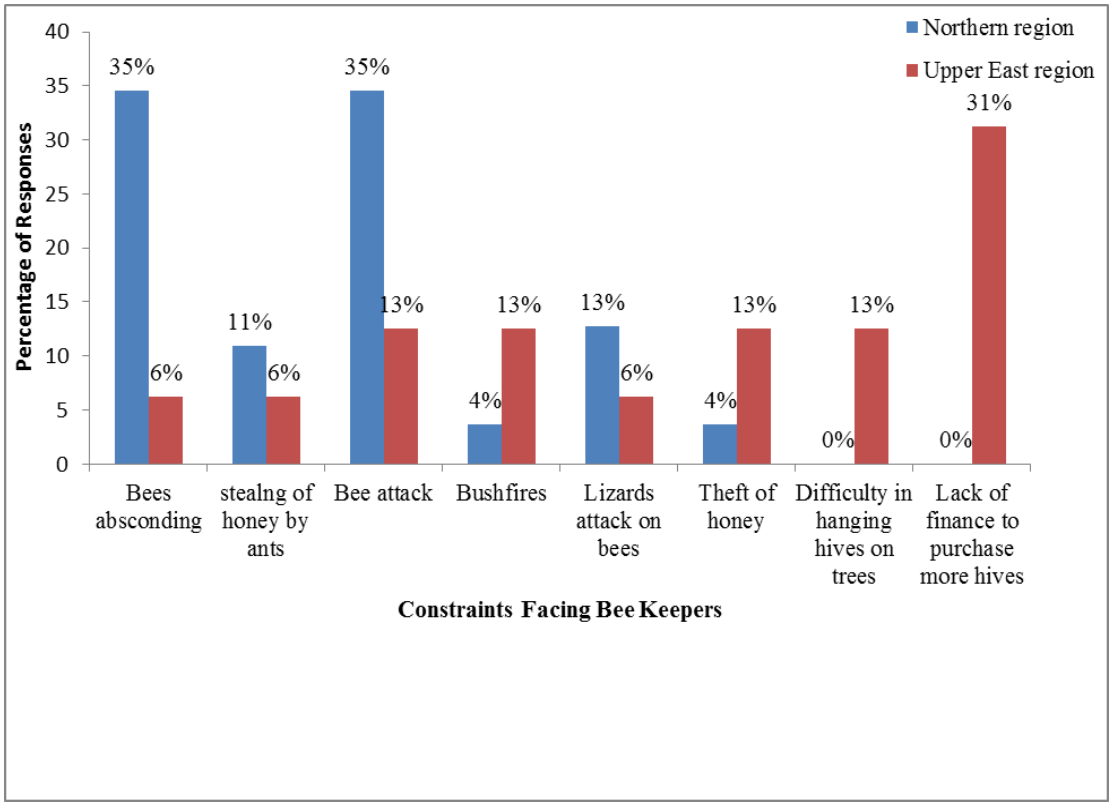

Figure 4.18 Constraints Facing Bee keepers

Source: Field Survey (2013)

Plate 9: Ant attack on hive mounted on a tree

Plate 10: Lizard on bee hive ready to eat any bee that comes out from the hive

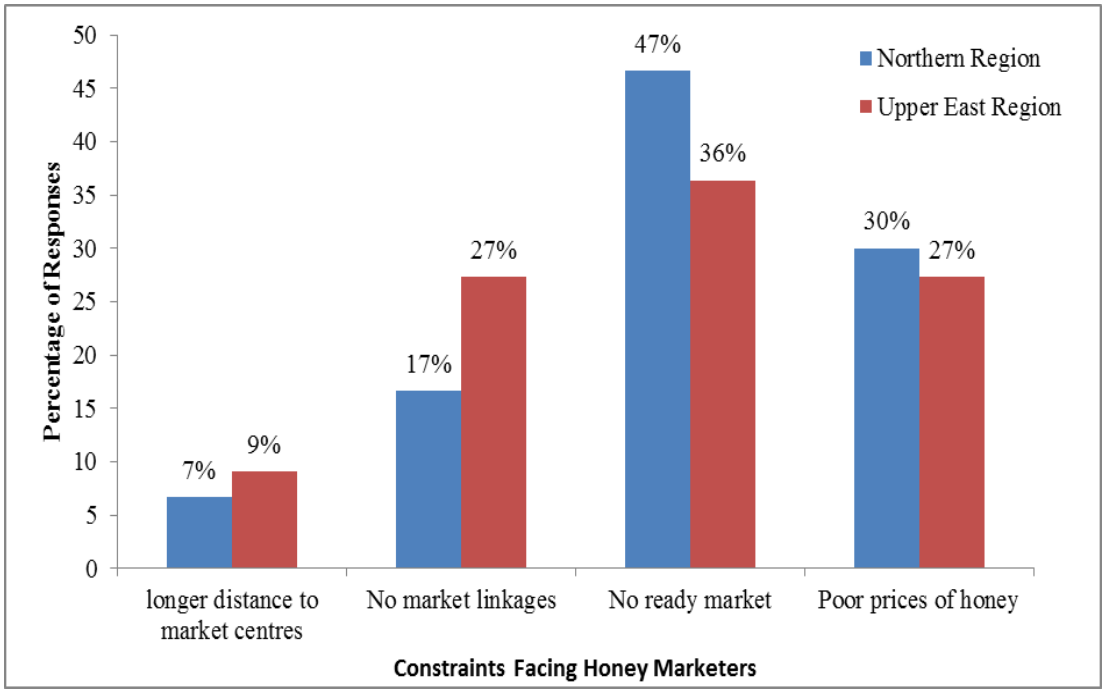

Figure 4.19 Constraints Facing Honey Marketers

Source: Field Survey (2013)

The honey marketing is either done by the bee keeper or people who buy from them and sell later (Middlemen and Retailers). The results from the survey revealed that honey marketers in Northern Ghana have no ready market for their products. This problem forms the majority of the responses from both the Northern (47%) and the Upper East (36%) Regions. This situation was particularly observed at Tuna in the Sawla-Tuna-Kalba district in the Northern region. The women bee keeping groups had many gallons of honey without buyers. Those who get buyers are mostly offered poor prices. This problem occurs because those who harvest from the wild using fire sell at cheaper prices and hence the buyers would like to buy from these groups at similar prices. Poor price of honey was also a major constraint to honey marketing in Northern Ghana. This problem formed 30% of the responses from the Northern Region and 27% of the responses from the Upper East Region. Furthermore, the producers have not established market linkages with the more vibrant buyers in cities hence delaying the sales of their honey. This problem formed 27% of the responses from the Upper East Region and 17% of the Responses from the Northern Region. These confirm the work of Total Transformation Agribusiness Ltd (2006) that fragmented honey production units make collective action in output marketing difficult. Singh (2002) also reported that exporters find it more convenient to deal with a few large commercial farms than with many small holders. Furthermore differences in quality due to non-uniform practices and difficulty of contacting large number of producers make small producers less attractive to exporters. This could also explain why marketers do not get ready market for their honey. Finally, the location of some of the communities also makes it difficult to access market. Some of these communities are far from the major market centres making accessibility to these

markets always difficult. They end up selling it cheaper to buyers who come to their communities to purchase it. This problem formed 9% of the responses from the Upper East region and 7% of the responses from the Northern Region.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, summary of the results, conclusion, recommendations and areas for further research are discussed. Key issues of the study through the use of value chain approach as a developmental tool to understand the current shea and honey value chains in Northern Ghana were discussed. Value chain analysis makes it easier to identify the issues and policies that can be implemented for shea and honey producers to increase their share of these gains.

5.2 SUMMARY OF THE RESULTS

The first research question had to do with the quantities of honey harvested by keepers per hive and the density of shea trees in Northern Ghana. The key findings revealed that the bee keepers are able to harvest between 2-5gallons (14kg-35kg) of honey/hive/year. The average yield of honey is about 3.4gallons/hive/year (23.8kg) in the Northern Region and 3.2gallons/hive/year (22.4kg) in the Upper East Region. The study also revealed that the highest natural regeneration occurred at Kata in the Northern Region and the least at Dosabligo in the Upper East Region. It was realized that the shea trees are much populated at the shea growing sites in Mandari community in the Northern region and less populated in Dosabligo in the Upper East Regions.

The second research question had to do with the local uses and market opportunities of shea and honey in Northern Ghana. The uses of honey and its by-products as mentioned by the respondents can be categorized into medicinal uses, food and baiting material for new hives. Similar shea nuts are processed into butter and the butter is used for frying food, used as skin and hair pomade and also for massaging as reported by respondents. The study revealed that majority (78.9%) of the shea nut processors in Upper East Region stores their nuts and sell later when prices are good whilst 44.4% of the processors in Northern Region sell their nuts immediately after processing. It was realized that majority (62.5% and 57.9 %) of the respondents in Northern and Upper East Regions respectively sell shea products at the local market within their communities other than traveling to other communities and nearby town to sell. It was realized that majority (57.7%) of the respondent in Upper East Region sell honey at the market within their communities. However, higher numbers (41.4%) of the respondents in Northern Region sell their honey at markets in nearby towns.

The third research question had to do with whether there are local conservation measures in place to ensure sustainable harvest of shea fruits and honey. The key findings were that, most of the communities have instituted several by-laws/regulations to regulate the harvest of shea fruits and honey. On the local conservation measures for shea, majority (38%) of the responses from the Northern Region indicates that community members are not allowed to cut down shea trees for charcoal or fire wood. Similarly, most (36%) of the responses from the Upper East also indicates that community members are not allowed to burn shea trees on farmlands even if the land belongs to them. Certain

conservation measures were only observed in Northern region and they include; no collection of shea nuts on Mondays and Fridays (17%) closed and opened season for shea fruits collection (14%). Similarly, some conservation measures were only observed in Upper East region and they include: weed control by controlled burning around shea trees (13%) and no bush burning in and around a community (6%). Also on the local conservation measures to ensure sustainable harvest of honey, bee keepers in Northern Region, create fire belts around apiaries (24%) while in the Upper East region, weeding in and around the apiary was the most frequent (21%) response. Closed and opened season for burning are also observed in some communities in both Northern and Upper East Regions, 22% of the responses from the Northern Region indicated that they observed closed and opened season for burning while 13% of the responses from Upper East Region indicated they observed closed and opened season for burning.

The fourth research question had to do with the current shea and honey value chain mapping. The key findings were that in both shea and honey production, there are different actors/participants in the value chain mapping that help to transform the products from the production level to the final consumption. The main actors in the shea value chain included shea fruit pickers, nut processors, shea nuts bulkers, butter processors, local cosmetics manufacturers, food vendors and consumers. The main actors in the honey value chain mapping included input suppliers, bee keepers, honey harvesters, honey extractors, wax extractors, retailers and consumers. It was also revealed that most of the producers played multiple roles in the value chain mapping.

The final research question relates to whether there are constraints in the shea and honey value chain development in Northern Ghana. Majority of the responses from shea fruit pickers in both Northern (47%) and Upper East (44%) Region indicated long distances covered to pick shea nuts as a major problem. Also most of the responses (52%) from the Northern Region as well as 38% of the response from the Upper East Region indicated no ready market and market linkage for shea nuts and butter as a major problem encountered by the shea nuts and butter processors. In Northern Region bee absconding (35%) and bee attack on keepers (35%) formed the majority of the responses from the region while lack of finance to purchase more hives formed the majority (31%) of the responses on constraints facing bee keepers in the Upper East Region. The results from the survey revealed that some of the honey marketers in Northern Ghana have no ready market for their products. This problem forms the majority of the responses from both the Northern (47%) and the Upper East (36%) Regions.

5.3 CONCLUSION

The average yield of honey is about 3.4gallons/hive/year in the Northern Region and 3.2gallons/hive/year in the Upper East Region. This shows that the honey producers in this area has the potential to increase production to meet the export demand of honey in the district, although these yield are low but is better as compared to the yield from other countries. Also shea tree regeneration and density are encouraging in the Northern Region as compared to the Upper East Region. However with this trend of regeneration in the Upper East Region, it implies that matured shea trees density in future may be

very low if interventions are not put in place to encourage natural regeneration or establishment shea plantations.

From the study, the respondents have considerable knowledge about the uses of honey and shea locally. They use it in their daily activities for purposes including medicinal and food uses. Also there are measures instituted by some communities in Northern Ghana to ensure the sustainable harvest of shea and honey resources. These are in the form of by-laws instituted by the chiefs and traditional priest. Although these by-laws are obeyed by some of the people, others go contrary to these by-laws.

Furthermore, there are different actors/participants in the value chain mapping that help to transform the products from the production level to the final consumption. It observed that most of the producers played a double role as producers as well as other actors in the value chain mapping. There are also challenges to the shea and honey value chain development in Northern Ghana. Some of these challenges were specific to either the producer groups or the marketers. Addressing these challenges will help to improve the shea and honey sectors in the region and also improve the livelihood of the rural poor who depend on these products for survival.

5.4 RECOMMENDATIONS

The following recommendations are made for intervention based on the conclusions above and also the research questions and the problem.

Develop Functioning Marketing Linkages

There is the need to develop good functioning market linkages to enhance easy access to market and fair prices for both shea and honey. This can be done through the formation of robust producers and traders associations in the shea and honey enterprise to help in collective bargaining for fairer prices and build the capacity of its members to compete in bigger markets.

Timing of Selling Produce

In Northern Ghana, shea fruits collection starts in April through to September, during this period the shea nut and butter prices are very low. During this period the supply exceeds demand. Shea nuts processors who sell their nuts at this period make little income. It is therefore recommended that shea nut and butter processors should store their nuts and sell them when the shea fruit collection period is over so as to gain higher prices for their products. Also butter processors should buy and store more nuts during the harvesting period when the cost of the nuts are lower so as to avoid high production cost during the post harvesting period.

Value Addition

Currently, majority of the shea nuts processors sell their nuts raw to butter processors and middle men who bulk them for large firms. No value is added so as to increase their gains. Those who further process the nuts into butter sell the butter in the raw state without further refining and packaging to attract high market prices. It is therefore recommended that shea nuts and butter processors should avoid selling majority of their

products in the raw state but add value to it by packaging them in attractive containers to attract good market and generate more income from their products.

Also majority of the bee keepers and honey marketers sell their honey in used plastic containers without any label. This gives their products less recognition and buyers cannot trace back to them to buy again when needed. It is therefore recommended that the honey producers through the formation of a cooperative or producers associations should come out with a nice package for their products with labels which can be traced back to their production centres so as to boost their market access. Currently honey is the only product extracted by all the producers, few extract bee wax. However, the value of bee keeping goes beyond honey extraction. It is therefore recommended that NGOs and also the producers through their association should organize training on how to extract other products such as bee wax, pollen, proboscis and other bee products so as to increase their gains from bee keeping.

Development of Market Information system

In the shea and honey value chains, buyers buy the nuts and honey from the producers by negotiating prices while the producers have no or limited market information. Information systems are hardly present because producers have no direct contact with the exporters to know the market price in the value chain. Due to the absence of good market information system producers sell their products without knowing the actual price in the market. It is therefore recommended that stakeholders in the shea and honey enterprises should facilitate access to domestic market information for sellers especially

in the rural market through the local radio stations, community information centres, seminars and workshops.

Conservation by-laws/regulations

Currently there are regulations concerning bush burning and cutting down of certain economic trees. However these regulations are not enforced in some communities as revealed by this study. For example closed and opened seasons for bush burning are not enforced. People cut down economic trees including shea trees for charcoal and firewood. These in a way have a negative impact on the sustainable harvest of shea fruits and honey from our savannah ecosystem. It is therefore recommended that strengthening of the enforcement of these by-laws and regulations at the community levels by the Chiefs, "Tindanas", Assembly members and community members will help in conserving our natural resources.

5. 5 AREAS FOR FURTHER RESEARCH

A study should be conducted on the power dependency among actors in a value chain and how to control the powerful actors to the benefit of other actors within the value chain. This will help to improve the small holder producers bargaining power in the value chain and also reduce the power of the buyer.

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APPENDIX

SHEA PRIMARY PRODUCERS QUESTIONNAIRE

Producer characteristics

Names of Respondents: _____ Age: _____

Gender: □M □F Marital Status: _____ Village: _____

Occupation: _____

(1) Shea Fruits

Harvesting

In what period of last year did you collect shea fruits?_____

What time of the day did you collect the shea fruits? From: ___ To: _____

How many times a week did you collect shea fruits? _____

How much shea fruits did you pick in one day? Quantity:_____

Did you harvest the shea fruits: □from the trees or □pick fruits that have already fallen to the ground?

If from the trees, what tools did you use? _____

Where are the trees from which you, or others in your family, collected shea fruits in the last season? _____

Were there any difficulties getting there? □Yes, Difficulties: _have to cover longer distance _____ □No

Have you had any conflict while picking fruit from a particular site in the last season? □Yes □No

If Yes, can you tell us about it? _____

What are some of the local conservation regulations/ by-laws on the protection and sustainable harvest of shea in your community?

_____

Processing & trade

Did you sell any of the fresh shea fruits you harvested last year? □Yes □No

If Yes, can you tell me:

How much of the total quantity of fruits picked did you sell in one day/season?

Day:_____ Season:_____

Where and to whom did you sell it? Location: _____ Buyers:

_____

What price did you usually get for this Quantity? Price:_____ Quantity: _____

Do you have any problems harvesting the shea fruits? □Yes □No

What are some of the uses of shea in your community? _____

If yes, tell us about them. _____

(2) Shea Nuts

Processing

How do you extract the nut from the fruit, and how do you prepare the nut for selling?

(Prompt tools and fuel used if omitted by respondent)

Process: _____

Trade

How many bags of nuts did you, or others in your family, sell last year? _____

Did you sell the nuts: □immediately after preparing them□ or did you □store them to sell later□?

If both, then what proportion did you sell immediately and what did you store to sell later? _____

□If sell immediately:

Why did you sell immediately? _____

Where and to whom did you sell? Location: _____ Buyers:____

What price did you usually get for a bowl? Price per bowl: _____

What price did you usually get for a bag? Price per bag: _____

Did □you decide the price or did □the buyer make an offer?

Did you decide the price you are willing to take? _____

If Offer: Did you ever accept the offer even if the price was lower than you expected?

□Yes □No

If Yes, Why?_____

□If store to sell later:

Where did you store the nuts? _____

What problems did you encounter in the storage of the nuts? _____

How did you decide when to sell the nuts? _____

Where and to whom did you sell? Location: _____Buyers: _____

Do you have any problems selling the shea nuts? □Yes □No

If yes, tell us about them. _____

(3) Shea Butter

Processing

How do you get the nuts to make the butter? □Pick □Buy □Other _____

Where do you store the butter? _____

What do you do to prevent the butter from being contaminated or spoiled by the weather? _____

What problems do you encounter in the storage of the butter? _____

Value addition

Do you use shea butter to make other products (such as soap or creams)? □Yes □No

If Yes, what are those products? _____

Can you describe how you prepare them? _____

What are some of the uses of shea in your community?_____

HONEY PRIMARY PRODUCERS QUESTIONNAIRE

Producer Characteristics

Names of Respondents: _____ Age: _____Gender: □M □F

Marital Status: ___ Village: _____

Occupation of Respondents _____

Bee Keeping

Do you harvest honey from □wild bee hivesor □do you keep bees in an apiary*?

Wild Harvesting

Where do you normally go to look for wild bee hives? _____

How far do you travel to look for wild bee hives? _____

What time of the year do you go harvesting honey from the wild? _____

How often do you go harvesting honey from the wild? _____

Do you prefer harvesting from the wild instead of keeping your own bee hives? □Yes □No

If yes, Why? **If No,** Why do you harvest from wild bee hives? _____

What are some of the conservation by-laws in your community that help protect the bees and your apiaries? _____

**Apiary*

How many hives do you own? _____

What type of hives are they? Construction Material:_____ Type: _____

Where did you site your hives? _____wild_____

How far did you travel to site your hives? _____

What considerations did you make before choosing the place to site your hives? _____

Are there other hives, not owned by you, where you site your hives? □Yes □No How many are there? _____

Do you attract □wild bees or □do you purchase artificially bred colony?

If wild:

How do you attract a colony of bees from the wild into your hive?_____

How long did it take your hive to be colonized by bees? _____ _____

Have you experienced abandonment of hive before? □Yes □No **If Yes**, how many instances?_____

What do you think was the major cause of the bees leaving? _____

How can you prevent your colony of bees from abandoning your hive? _____

How frequently do you visit your apiary? _____

What activities (management) do you undertake in your apiary when time you visit it? ___

Has your apiary ever been burnt by bush fire before? □Yes □No

If Yes, what caused the fire?_____

Have you been attacked by the bees before? □Yes □No **If Yes**, how frequently does it happen?_____

What caused the attack? _____

Harvesting

How do you know that the honey is ready for harvesting? _____

*How long does it take for a hive to be ripe for harvesting? _____

What quantity of honey do you get from a hive? _____

What tools/ equipment do you use in harvesting your honey? _____

Can you please describe how you harvest your honey and how you extract the honey from the combs? Process: _____

*Do you cut all the combs from the hive (from the top bars)?

□Yes, why: _____

□No, why: __ _____

Apart from the honey, are there other products you harvest or get form the hive? □Yes □No

Do you use these by-products? □Yes □No

If Yes, how do you use them? _____

What are some of the uses of honey in your community? _____

Transport and storage

How do you transport your honey home?Process:_____

Do you store your honey for a while before selling? □Yes □No

If Yes:

What do you store it in? _____ Where do you store it? _____ For how long?_____

Trade

How do you package the honey for sale? ____ _____

Where and to whom do you sell your honey? Location: _____ Buyers: _____

Do you always have ready market for your honey? □Yes □No why?: _____

How do you determine the price of the honey? ____Buyers make an offer_____

For what amount of honey is that price? _____

Do you always get the price you want? □Yes □No

Apart from the raw honey you sell, do you prepare the honey or it's by products into other products before selling? □Yes □No

If Yes, what are those products? _____

Can you describe how you prepare them? _____

Where and to whom do you sell these products? Location: _____ Buyers: _____

How do you determine the price of these products? Prices: _____

GROUP DISCUSSION FOR SHEA PRODUCER GROUPS

Location: _____ Group Name: _____Group Members: _____ Participants: _____ Group Maturity: _____

What activities do group members do together?

How do you benefit from being a member?

NRM & Traditional Governance

Where are the trees where you harvest shea fruits and nuts?

Who if anyone own the land with these trees?

Are you allowed to cut shea trees in your community?

What about on your own land?

Are there any fines or punishments for people cutting shea trees?

When does the picking season begin?

Are there any rites that you have to perform before you start picking? What do they involve?

How many of you will do this?

What rules do you have in your community to regulate burning of the bush?

Is there a season when burning is allowed? When does it start and end?

Are there any fines or punishments for people burning when it is not allowed?

Do you undertake any management practices in the wild shea parklands you pick from?

Are men and children involved in the shea business? If so, How?

Trade & Markets

How many in the group sell shea nuts?

How many in the group sell shea butter?

What problems do you face selling shea nuts and butter?

How do you determine the price at which you sell shea butter?

Have you received any support so far for your shea activities?

Are there any other activities you would like to receive support for, more than shea?

What are your expectations from this new Programme?

GROUP DISCUSSION FOR HONEY PRODUCER GROUPS

Location: _____ Group Name: _____Group Members: _____ Participants: _____ Group Maturity: _____

What activities do group members do together?

How do you benefit from being a member?

What was the reason for you coming together as a group?

What support have you received in the past as a group?

What activities do you do together as a group?

How do you benefit from being part of a group?

NRM & Traditional Governance

What are some of the measures you have put in place to protect the plant community where you set your hive?

What rules do you have in your community to regulate burning of the bush?

Is there a season when burning is allowed? When does it start and end?

Is there a rite that you have to perform before bush burning is allowed in your community?

Are there any fines or punishments for people burning when it is not allowed?

What are some of the daily management practices you undertaken at your apiary?

Do you have problems with any pests?

What are some taboos concerning the bees or bee keeping and what a punishment goes to violators of the taboos?

Do you have any other problems keeping bees or harvesting honey?

Trade & Markets

How many of you are keeping bees?

How many of you have harvested honey this year or last year?

How many of you have sold any of the honey you have harvested?

What problems do you face keeping bees?

What problems do you face selling honey?

How do you determine the price at which you sell honey?

Why is the price lower than you expected?

What support, if any, would you like to receive for your bee keeping activities?