

**UNIVERSITY OF EDUCATION, WINNEBA**  
**COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

**UTILIZATION OF SHEA AND DAWADAWA TREES IN WA WEST DISTRICT:**

**ACTORS, DRIVERS AND IMPACT**

**MUSAH ISSAH**

**JULY, 2018**



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**A dissertation in the Department of CONSTRUCTION AND WOOD  
TECHNOLOGY, Faculty of TECHNICAL EDUCATION, submitted to the School  
of Graduate Studies, University of Education, Winneba, in partial fulfilment of the  
requirements for the award of Master of Technology Education (Wood) degree**

**JULY, 2018**

## DECLARATION

### STUDENT'S DECLARATION

I, Musah Issah, declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE.....

DATE.....

### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: DR. FRANCIS KOFI BIH

SIGNATURE.....

DATE.....

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## **DEDICATION**

I dedicate this work to my family



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## ABBREVIATIONS

<b>ACRONYM</b>	<b>MEANING</b>
CBE	Cocoa Butter Equivalent
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRIG	Cocoa Research Institute of Ghana
DFID	Department for International Development
FGD	Focus Group Discussion
GEPC	Ghana Export Promotion Council
NBSSI	National Board for Small Scale Industries
NGOs	Non-Governmental Organisations
NTFP	Non-Timber Forest Product
PBC	Produce Buying Company
SARI	Savannah Agricultural Research Institute
SDG	Sustainable Development Goals
SPSS	Statistical Package for Social Scientist
UDS	University for Development Studies

## ABSTRACT

Economic trees play important role in household livelihood, sustainable land use, land rehabilitation and environmental sustainability as a whole. In the Wa West District, Shea and Dawadawa trees are key economic trees from which households rely on for living. However, the method and purpose of utilization of these economic trees creates conflicting objectives for different actors. Besides, empirical studies on the utilization of economic trees in the area are limited, making it inconclusive how people exploit Shea and Dawadawa trees for their living. The purpose of this study was therefore, to examine the actors, drivers, and impact of shea and dawadawa trees utilization in the Wa West District. This is a descriptive study that drawn cross-sectional data from 185 households and key stakeholders in the Wa West District. The respondents were selected using probability and on-probability sampling procedures. The primary data were collected using questionnaire, interview schedule, and Focus Group Discussion. The results were analysed using qualitative and quantitative methods. The results indicate that the key actors of shea and dawadawa trees utilization are women, men, and children. Besides, some groups of people that play key roles in the utilization of these trees include shea nut processors, dawadawa processors, chainsaw operators, charcoal producers, farmers, estate developers, carvers, and Fulani herdsmen. The activities they engaged in include; dawadawa processing, shea nut picking, processing and selling, Shea butter processes and soap making, medication, firewood gathering, tree logging and charcoal burning/production. These activities serves as livelihood activities, food and income generation for households in the area. On the other hand, utilization of the trees has negative impact on the environment such as destruction of economic trees, bushfires, and deforestation. This threatens the lives of those whose livelihoods are entirely dependent on the environment. The study concludes that rural households depend on the natural assets of their immediate environment but the current methods of utilization by key actors have not been sustainable and future development potentials from utilization of these trees will soon be lost. The weakness associated with local and state institutions has translated into the mode of operations of key actors in the utilization of economic trees. The findings of the study have implication for policy for the sustainability of livelihood activities, traditional medicine and environment of the area.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Economic trees especially Shea and dawadawa play a very important role in sustainable land use, land rehabilitation and environmental sustainability as a whole (Amoako, 2012). Their products currently provide employment and income for approximately 900,000 women in Ghana and have also increased women's incomes by 50% (Banye, 2015). Advocates for gender equity and sustainable development maintain that economic trees such as Shea and Dawadawa have the potential to improve the quality of life for female producers (Rood, 2017).

Shea trees are only native to 22 countries in the world, play a vital ecological and economic role in the semi-arid landscape and is very significant to the indigenous land holding tribes (Rood, 2017). The Shea tree is one of the predominant tree species in countries such as Ghana and Burkina Faso and plays an important role in the lives of the people (Amoako, 2012; Banye, 2015; Venturini *et al.* 2016). Shea is known to target at least three of the major Sustainable Development Goals put forth by the United Nations for the 2015-2030 time period (Rood, 2017). These goals among others include to end poverty (Goal 1), to end hunger (Goal 2), combat climate change and its impact (Goal 13) and promote sustainable management of forest, reverse land degradation and biodiversity loss (Goal 15) (Lal, 2017). It is estimated that approximately 9.4 million shea trees grow in Ghana, covering almost half the country and occurring across almost the entire area of the three northern regions (Jasaw, 2015). The shea growing area is estimated to be around 77,670 km<sup>2</sup> in Western Dagomba, Southern Mamprusi, Western Gonja, Lawra, Tumu, Wa and

Nanumba districts, with the Eastern Gonja district having the densest stands of shea trees. Sparser shea tree cover is found in Brong-Ahafo, Ashanti, and the Eastern and Volta Regions in the south of the country (Kavaapou, 2010; Cocoa Research Institute of Ghana 2002).

People around the shea belt especially Ghana and Uganda engaged in conflicting uses of the shea tree (Atalla, 2015; Banye, 2015; Adams et al. 2016; Amoako, 2012). Firstly, the shea industry comprises the picking of shea fruits and nuts (Kavaarpou, 2010). The fruit pulp is nutritious and a very important source of calories, vitamins and minerals and an important source of food for many organisms including birds and bats (Jibreel *et al.* 2013; Laube, 2015). The fruits of the shea are a source of diet to many rural folks (Adams et al., 2016). Secondly, the fruit of the shea tree has a seed (nut) and in this seed is a kernel which is dried and stored for processing into shea butter (Jibreel et al. 2013; Kavaarpou, 2010; Laube, 2015). The shea butter is used as cooking oil, manufacture of local soap, used as substitute for kerosene in lightening and used in preparation of most herbal medicine (especially those that are prepared as cream (Adams et al. 2016). Equally important, the shea butter is an important ingredient for a number of industrial processes in confectionery, cosmetics and pharmaceutical industries and is therefore a high value commodity that has potential to attract good prices and generate a profitable income (Banye, 2015). Thirdly, the bark of the shea tree is used as medicine for treatment of stomach ache; and dry shea trees used as firewood (Adams et al. 2016; Amoako, 2012). Equally important, is the sale of both nuts and butter domestically and for export (Kavaarpou, 2010). Foreign confectionary and cosmetics industries demand is the current backbone of the shea industry resulting in the industry's growth (Okine, 2017). It is estimated that over 600,000 women

in the northern Ghana collect about 130,000 tonnes of nuts yearly, 40 per cent of which are exported. This contributes about US\$30 million annually to the national economy (MLNR, 2016).

Dawadawa (African locust) is also considered as an economic tree that is been consumed by households. Whole pods are eaten by domestic stock including cattle. The young seedlings are nutritious and heavily browsed by livestock. The seed of the African locust bean when boiled and fermented is known as “dawa-dawa” in Hausa language in Nigeria, a black smelling tasty seasoning, rich in lipid 29%, protein 35%, carbohydrate 16%, good source of protein, fat, calcium for rural dweller (Sacande & Clethero, 2007). The bark is used as mouth wash, vapour inhalant for toothache, or for ear complaints. It is macerated in baths for leprosy and used for bronchitis, pneumonia, skin infections, sores, ulcers, and washes for fever, malaria, diarrhea, and sterility. Roots are used in a lotion for sore eyes. Pulp is supposedly a water purifier but possibly just sweetens and disguises taste of foul water. The sweet yellow pulp contains 60% sugar when ripe and the seeds contain vitamins as well as minerals (Sacande & Clethero, 2007). The fruit pods are used to produce an insecticide powder for treating crops. Parkia tree is used as timber for making pestles, mortars, bows, hoe handles and seats (Joshi & Joshi, 2009).

On the other hand, Shea and Dawadawa trees have different alternative uses. Rood (2017) discovered that the Shea tree is a primary source of wood for charcoal production, due to the perception that shea is the most efficient and robust fuel wood. This was corroborated by Osie (2015) that shea charcoal was the most preferred among the others. He further indicated that shea was the most preferred species due to its quality charcoal and wood fuel and also serves as the means of revenue for the people. The conflicting objectives among

households in the utilization of shea and dawadawa trees require that the economic trees are used in sustainable way to serve the needs of people. This draw the attention of many development organisations such as governments to further explore and develop the potential of economic trees especially in rural areas.

The economic role of shea and dawadawa tree implies that they remain key economic trees that are used as indigenous medicines and food for man, crops and animals. These potentials have attracted collaborative research and investment especially, on the shea tree. For example, during the 1950s, research and technological development in the European fats and oils industry identified shea butter as a highly suitable Cocoa Butter Equivalent (CBE), which is used largely by the confectionary industry in the production of chocolate (Wardell & Fold, 2013). Since this discovery, the market for shea butter has continued to increase internationally, as shea butter is also used widely in the cosmetic industry. Regulation of the shea industry in Ghana began with a state owned corporation known as the Produce Buying Company (PBC). The PBC touted shea as a way to boost the economy of northern Ghana, which continues to trail far behind the southern regions. In the 1980s the PBC dictated the establishment of Shea Nut Farmer Societies that averaged 25-30 members and would collect shea nuts for sale to state owned company representatives at a fixed price. These effort means that the attention towards the development of the shea tree is the exploitation of its products to develop its value chain; contrary to some current utilization of the tree as source of energy (charcoal).

Recent development in the sub-sector indicate that research institutions like the University for Development Studies (UDS) and Savannah Agricultural Research Institute (SARI) are collaborating to conduct scientific research on the shea tree, particularly how it can be

grown on plantations like Cocoa. More importantly, the government is pursuing a policy for the establishment of a Shea Board to be solely responsible for planning and coordinating the activities of shea industry (Al-hassan, 2012).

## **1.2 Problem statement**

Various empirical studies have indicated that economic stress such as Shea and dawadawa contributes to household livelihood in diverse forms. Shea trees begin bearing large plum like fruit with large seeds about 15 to 20 years after planting. Average annual kernel production is about 2.2 kg per tree (Gbedji, 2003). Shea trees are known to be productive for over 200 years or more (Naughton, 2016). This means that shea trees in particular are one of the cash crops that can effectively be utilized for several generations of people. However, throughout the shea belt of Africa, the shea nut tree continues to be exploited for charcoal production (Atalla, 2015; Rood, 2017). In Ghana, these trees are currently threatened by agricultural expansion, charcoal production and illegal logging (Rood, 2017). Ghana depends on wood fuel as its main source of energy especially in the rural communities. Wood fuel is used for cooking and heating in households and in the commercial/service sectors and within the informal industrial sector like bread baking, palm oil processing, brewing of local drinks, tobacco curing, tie and dye production, fish smoking and soap making amongst others (MLNR, 2016). Furthermore, the supply of wood fuel has come mainly from the natural forests; indeed more than 90 per cent of wood fuel consumed in Ghana has been estimated to be supplied from farmlands and natural forests within the transitional and savannah zones.

On the other hand, people who destroy economic trees for agriculture purpose, charcoal production and logging also earn their livelihoods from those activities (Osei, 2015). These practices lead to deforestation with negative consequences on the environment (MLNR, 2016). The driving forces of this phenomena (deforestation and forest degradation) have been agriculture expansion, illegal logging (chainsaw operation) and unauthorized mining (galamsey) operations in the forest areas, illicit and uncontrolled exploitation of wildlife, unsustainable production of woodfuel especially in the fragile ecological areas of the savannah regions and wildfires (MLNR, 2016). Shea and dawadawa trees grow in the fragile savannah ecological regions and thus their unsustainable exploitation could have a devastating impact on the environment. This brings to fore the controversy on the utilisation of economic trees for wood in the fragile savannah areas in Ghana.

In the Wa West District, both Shea and Dawadawa trees are being utilized by households as a livelihood strategy. Currently, the sustainable use of these trees is being threatened by the unsustainable use for timber and charcoal production. Continuous use of Shea and Dawadawa trees for timber and charcoal production could have a serious consequence on the fragile savannah environment. However, no empirical study has been conducted to determine the actors, drivers and impacts of this change. A critical examination of the actors in the utilization of economic trees, the influence of their activities on their livelihood and the environmental impact associated with that is therefore, necessary. This will reveal the challenges and potentials of economic trees to the economic development of the Wa West District.

### **1.3 Purpose of the Study**

The purpose of the study is to examine the actors, drivers and impacts of Shea and Dawadawa trees utilization in the Wa West District.

### **1.4 Research Objectives**

- i. To identify the drivers and actors of Shea and Dawadawa trees utilization in the Wa West District.
- ii. To assess the social and economic impacts of Shea and Dawadawa trees utilization on the livelihoods of households.
- iii. To evaluate the environmental impact of unsustainable Shea and Dawadawa trees utilization. Wa West District

### **1.5 Research Questions**

Specifically, the study seeks to answer the following questions:

- i. What are the drivers and actors of Shea and Dawadawa trees utilization in the Wa West District?
- ii. How has the utilization of Shea and Dawadawa trees influencing the livelihoods of households
- iii. What is the environmental effect of the utilization of Shea and Dawadawa trees?

### **1.6 Significance of the Study**

Empirical studies (e.g Rood, 2017; Amoako, 2012; Banye, 2015; Venturini *et al.*, 2016; Jasaw, 2015) have established that the Shea tree is very important in terms of its economic

contribution. These studies specifically, maintain that the Shea tree serves as an alternative livelihood strategy especially for rural people, besides farming. However, some households also resort to the destruction of these trees through charcoal production, logging and as firewood. This brings to the fore a conflicting use of economic trees in most part of Ghana. In the Wa West District, there are limited empirical studies on the utilization of economic trees such as Shea and Dawadwa. The results of this study will therefore, contribute to knowledge on the utilization of economic trees and how that contributes to livelihood.

Besides, the findings of the study will bring to bear the livelihood as well as the environmental effects of shea and dawadawa trees utilization by households in the Wa West District. This will lead to policy formulation at local, regional and national level on the nexus of livelihood and environmental effects of economic trees utilization. Besides, the Wa West District Assembly and other major stakeholders will be aware of the consequences of some livelihood activities related to economic tree utilization.

The findings of the study will inform households, especially, farmers, charcoal producers, among others on both the social, economic and environmental effects of their activities. This can lead to pragmatic measures towards sustainable development at the community level.

### **1.7 Scope of the Study**

The study has a contextual and geographic scope. There are several economic trees that are found in the Wa West District. However, this study is limited to analysis of only Shea and Dawadawa trees because of their frequent and extensive utilization. Besides, the trees may



be utilized for different purposes but this study focuses on only the effect on livelihoods and environment.

Geographically, Shea and Dawadawa trees are found in all parts of the Upper West Region. However, the empirical evidence were limited to the Wa West District in the Upper West Region. This led to an in-depth analysis and hence a better understanding of the issue under study. Exploitation of economic trees in other parts of the Upper West Region outside the Wa West District was not the focus of this study.

### **1.8 Organization of the study**

The study is organized into five chapters. Chapter one introduces the study and address key issues such as the background, the problem statement, research questions and objectives, the scope of the study, and the significance of the study. Chapter two presents a review of empirical studies on the issues under investigation. It provides extensive review of literature on the actors of shea industry, the contribution of the utilization of shea trees to livelihoods, and the environmental effects of utilizing shea trees. Chapter three is the research methodology and hence discusses the general procedure use in carrying out the study. It presents key issues include the study design, study population and sampling procedures, instruments and the types of data, ethical consideration in data collection, validity and reliability of the instruments and the methods of data analysis. Chapter four is the data analysis and presentation and chapter five provide a summary of the entire study, conclusions and recommendations for policy.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents a review of empirical studies on the utilization of economic trees for livelihoods. Several concepts and variables have been reviewed with much focus on the objectives under study. Specifically, the chapter presents empirical review under economic trees (Shea trees and Dawadawa) utilization, the influence of its utilization to livelihood and the effect of its utilization on the environment. Various implications have been drawn on the Wa West District of the Upper West Region of Ghana. Finally, the chapter presents a review of literature on the institutional mechanisms in promoting the sustainable utilization of economic trees.

#### **2.2 Description of Economic Trees**

This section presents a review of economic trees. The main focus has been on a description of shea and dawadawa and their importance as economic trees.

##### **2.2.1 Shea**

The shea tree (*Vitellaria paradoxa*), belongs to the family of Sapotaceae that has nuts which can be processed for different purposes (Kavaarpuo, 2010; Yussif, 2015). Economic trees such as shea and dawadawa grow in a large part of Sub-Saharan Africa. These trees are important for the livelihoods of the rural population as it has been for over centuries (Amoako, 2012; Banye, 2015; Venturini *et al.*, 2016). Trees especially, shea trees play a very important role in sustainable land use, land rehabilitation and environmental sustainability as a whole (Amoako, 2012). This tree is an indigenous tree species to many

countries in Sub-Saharan Africa and in these countries the shea tree and its many uses have been known for over centuries (Carette *et al.*, 2009). The shea plant (*Vitellaria paradoxa*) is an economic tree naturally found across the savannah regions of Sub-Saharan Africa, and occurs mostly within the woodlands of the Sudan-Sahelian grasslands (Charles, 2015).

Shea trees are only native to 22 countries in the world, and they play a vital ecological and economic role in the semi-arid landscape and hold significant to the indigenous land holding tribes (Rood, 2017). The Shea tree is one of the predominant tree species in countries such as Ghana and Burkina Faso and plays an important role in the lives of the people (Amoako, 2012; Banye, 2015; Venturini *et al.* 2016). Shea trees start to bear fruits at the age of 15-20 years, and reaches maturity from about 45 years. The tree can produce fruits up to its 200th year or more (Carette *et al.*, 2009).

### **2.2.2 Dawadawa**

Dawadawa (*Parkia biglobosa*) is one of the 34 known species of the genus *Parkia* whose centre of origin is in South America (Abdulrahman *et al.*, 2016). Barks are distinctly longitudinally fissured, often with more or less regular scales between the fissures, thick, ash-grey to greyish-brown, slash fibrous and reddish brown, exuding an amber gum; crown dense, wide spreading and umbrella-shaped, consisting of heavy branches. Leaves are alternate and dark green (Burkill, 1995). *Parkia biglobosa* commonly called African locust bean tree is known in Yoruba as Igba, or Irugba, in Hausa as Dorowa and in Igbo as Origili. African Locust Bean (*Parkia biglobosa*) is among the leguminous plants used by man particularly in some African countries for the production of local condiment

(Abdulrahaman *et al.*, 2016). Dawadawa is a perennial deciduous tree which occurs in the rainforest and the arid zones of some African countries (Ademola *et al.* 2015). It is a perennial tree of considerable multipurpose importance (Udo *et al.*, 2016). The tree has the capacity to withstand drought; seeds are embedded in a mealy pulp that is high in energy value. This tree is protected by the peasant farmers and rural dwellers for its many benefits.

Studies have shown that the *Parkia biglobosa* is an important economic and social tree legume of considerable multipurpose importance. *P. biglobosa* is a non-timber forest product (NTFP). Non-timber forest products derived from *P. biglobosa* are food, medicine, animal fodder, soil amendments, charcoal, and firewood are the most significant product from *P. biglobosa* is food (Gernah *et al.*, 2007; Udo *et al.* 2016; Alexander, 2015). The food products collected from *P. biglobosa* are especially important due to the seasonality of fruit maturation and food availability (Alexander, 2015). The yellowish powder inside the seed pods is sweet and can be eaten without preparation or also be made into drinks which are good source of nutrients for humans (Gernah *et al.*, 2007; Udo *et al.* 2016). The yellow starchy pulp that surrounds the seed is an important food supplement rich in Vitamin C and carbohydrates (Abbiw, 1990). The dried powder is often mixed with water to produce a drink called dozim (Abbiw, 1990). Udo *et al.* (2016) highlighted the importance of the species in the agricultural industry. All parts of the fruit including the sweet, mealy pulpy pod and the seeds are known to be valuable cattle feed. They also provide ecological services including soil fertility and microclimate amelioration. Health wise, tree is also used for medicinal purpose and as a source of mouthwash to relieve toothaches (Lawson, 1965). The bark of the tree is used as mouth wash, vapour inhalant for toothache, or for ear

complaints. It is macerated in baths for leprosy and used for bronchitis, pneumonia, skin infections, sores, ulcers, and washes for fever, malaria, diarrhoea, and sterility. Roots are used in a lotion for sore eyes (Udo et al. 2016). In addition to direct domestic use of the tree products, they are a source of cash for local people (Odebiyi et al., 2004). Economically, Parkia tree is used as timber for making pestles, mortars, bows, hoe handles and seats (Joshi & Joshi, 2009). The tree also attracts bees and is a popular tree among bee keepers. The young seedlings are nutritious and heavily browsed by livestock (Udo et al. 2016).

### **2.3 Actors in Economic Trees (Shea and Dawadawa) Utilization**

Empirical studies elsewhere in Africa share similar view with regard to the role of shea nut in livelihood. Ferris, *et al* (2001) for example, argue that, income from shea in Uganda is more than other major livelihood outcome such as brewing and farming. Households eat the fruits and the oil is considered as the only single source of cooking oil in some communities. Farris *et al.* (2001) therefore explain that shea business is not just entirely for women only but involves other groups such as men and children. Consistent with this argument, Moore (2008) adds that, the use of the shea tree covers aspects of livelihood, poverty reduction through the selling of its products and food security through the fruit pulp and oil from the nut. The shea tree is second most important oil crop in Africa after palm nut tree (Hatskevich, *et al*, 2011) which plays a major role in the livelihood of people in places where it is known to be dominated and even beyond. This means that several people consisting of different social groups, age categories among other things constitute the main actors in the shea value chain.

It is estimated that approximately 9.4 million shea trees grow in Ghana, covering almost half the country and occurring across almost the entire area of the three Northern regions (Jasaw, 2015). This potential attracts large groups of people especially, the rural folk to engage in gathering shea fruits for a living. The shea growing area is estimated to be around 77,670 km<sup>2</sup> in Western Dagomba, Southern Mamprusi, Western Gonja, Lawra, Tumu, Wa and Nanumba districts, with the Eastern Gonja district having the densest stands of shea trees. Sparser shea tree cover is found in Brong-Ahafo, Ashanti, and the Eastern and Volta Regions in the south of the country (Kavaapou, 2010; Cocoa Research Institute of Ghana 2002). Shea trees are indigenous assets, and grow in the wild in the northern savannah areas of Ghana. People around the shea belt especially, Ghana and Uganda however, engaged in conflicting uses of the shea tree (Atalla, 2015; Banye, 2015; Adams et al. 2016; Amoako, 2012). In northern Ghana, shea is a business for women and a source of income for many families and to some extent contribute in some cases more than half of annual income of households in the Upper West region in particular (Carette *et al*, 2009). This suggests that women are the primary actors in shea business. Shea therefore plays several roles in rural livelihood in different ways. It is an important commodity for trade; the butter is consumed locally in producing regions as food, cosmetics, soaps and detergents, medicines, and for cultural and religious purposes (Seidu, 2012). This means that the main actors in the shea value chain include traders, food processors, industry players, charcoal producers among others.

### 2.3.1 Shea Traders

Rural women engage into the shea business activities at a time of the year, when many rural households lack financial resources and often even foodstuffs, and when their heavy domestic as well as agricultural schedule leaves them some time (Laube *et al.*, 2017). It is therefore important to note that these shea activities create employment for these women, thus making them key actors in the shea value chain. Its products currently provide employment and income for approximately 900,000 women in Ghana and have also increased women's incomes by 50% (Banye, 2015). This means that shea trade has the potential of empowering rural people through livelihood enhancement. Notably, Okine (2017) in his study on achieving sustainable development through shea trade disclosed that women empowerment, capacity and community transformation are some of the social benefit of the shea and this suggests that the shea industry function in several ways beyond providing livelihoods to households. Both the general level of poverty of rural households as well as the timing of the shea harvest make shea nut picking an important activity helping to cope with the worst consequences of rural poverty (Laube *et al.*, 2017).

Many actors are involved in the shea butter supply chain and this sometimes leads to asymmetry distribution of income among the actors. In his analysis, Yussif (2015) found that among the shea chain actors studied, shea butter processors received the lowest profit margins (16.67%) while shea collectors received the biggest margin (52%). The supply chain of nuts and shea butter is complex as there are many actors involved. On Tamale market (Northern Region, Ghana) three types of bulk traders are distinguished: 1) local traders 2) traders from the South of Ghana 3) for instance, traders who also trade abroad (Carette *et al.*, 2009). This assertion suggests that the actors of shea business do not only



consist of rural folk who process the nuts but also include people across international boundaries that trade in shea. In addition, shea butter processors also incur the highest cost while shea kernel processors have the lowest costs- 84% for butter processors and 7% for shea nut collector/kernel processors (Yussif, 2015). In Ghana there are businesses set up that have started producing cosmetic products based on shea butter. The production of these cosmetics will lead to the create employment (Carette et al., 2009). Deductively, the shea industry serves as source of employment for many folks. This implies that improvement of the value chain of shea through trade creates further employment opportunities.

Equally important, is the sale of both nuts and butter domestically and for export (Kavaarpuo, 2010; Yussif, 2015). The 8 major exporters of shea are Burkina Faso, Mali, Ghana, Nigeria, Cote d'Ivoire, Benin, Togo and Guinea-Conakry (Carette et al. 2009). Presently, shea is exported to France, Great Britain, the Netherlands, Denmark, North America and Japan. Shea is mainly exported in the form of shea kernels, shea butter or finished shea products (Carette *et al.*, 2009). It is estimated that over 600,000 women in the northern Ghana collect about 130,000 tonnes of nuts yearly, 40 per cent of which are exported. This contributes about US\$30 million annually to the national economy (MLNR, 2016). Foreign confectionary and cosmetics industries demand is the current backbone of the shea industry resulting in the industry's growth (Okine, 2017). The global popularity of the shea industry is associated with the export of shea commodities on the international market for use in the pharmaceutical and confectionery industries especially as a cocoa butter equivalent (CBE) in the manufacture of chocolate, margarine, biscuits, soap and other cosmetic products due to the presence of desirable properties such as stearin and the low melting temperatures of shea butter (Lovett, 2010). The demand for shea products is

increasing; especially in the US, Japan and Europe (Carette *et al.*, 2009). This invariably, is promoting the local shea industry in different places of northern Ghana. Hence the internal and external trade in shea products is a process of livelihood enhancement of the rural folk whose immediate environments are blessed with shea trees.

The foregoing discussion implies that the shea industry provide livelihoods alternatives to both rural and urban dwellers. In typical rural areas, this employment opportunity through trade in shea is very relevant given the limited employment opportunities besides, farming. The literature also suggests that the shea industry promote international trade that brings foreign exchange to the economy of Ghana. The opportunity of the industry in trade promotion requires effective protection of the shea trees in order to attain sustainable development.

After crops, environmental income (cash and subsistence) is the most important contributor to household total yearly net income, and for the poorest income quartile in each study site, environmental income contributes as much as or more than crop income to total household income. Fuel wood, bush meat and wild foods from plants are the most important environmental products (Hansen *et al.* 2015). However, this priority tree with enormous economic and social values is rapidly declining due to rapid human population growth and some after crops environmental income activities such livestock population pressures, increasing land fragmentation, over exploitation for seed (food) and a high demand for wood fuel especially charcoal (Udo *et al.* 2016).

### **2.3.2 Food Processors**

Firstly, the shea industry comprises the picking of shea fruits and nuts (Kavaarpuo, 2010; Yussif, 2015). Besides the monetary value shea is also of nutritional value as it is an

important source of fats and vitamins (Carette et al. 2009). Generally shea trees are valued for their fruits and the nuts by the rural communities. Shea trees start to bear fruits at the age of 15-20 years, and reaches maturity from about 45 years. The tree can produce fruits up to its 200th year or more (Carette *et al.*, 2009). This suggests that the shea tree has the potential of serving many generations than most economic trees once its benefits can be utilized for several decades. The shea fruits which when ripen fall under their own weight and are gathered by women, children and some men from April to August of every year. The fruit pulp is nutritious and a very important source of calories, vitamins and minerals and an important source of food for many organisms including birds and bats (Jibreel *et al.*, 2013; Laube, 2015). The fruits of the shea are a source of diet to many rural folks (Adams *et al.*, 2016). In their study on the shea industry and rural livelihood in the upper west region Adams *et al.* (2016) found that the shea fruits are eaten as source of diet. The fruits are not only eaten as food but can be sold (Carette et al. 2009). On the other hand the fruit of the shea tree has a seed (nut) and in this seed is a kernel which is dried and stored for processing into shea butter (Jibreel *et al.*, 2013; Laube, 2015). The butter is eaten as food or is used as raw material for further production of goods.

The shea tree (*Vitellaria paradoxa*), belongs to the family of Sapotaceae that has nuts which can be processed into butter (Kavaarpuo, 2010; Yussif, 2015). The nuts that this tree produces can contain from 20% up to 50% edible fat (Carette *et al.*, 2009). The shea butter is used as cooking oil, manufacture of local soap, used as substitute for kerosene in lightening and used in preparation of most herbal medicine (especially those that are prepared as cream (Adams *et al.*, 2016). Equally important, the shea butter is an important ingredient for a number of industrial processes in confectionery, cosmetics and

pharmaceutical industries and is therefore a high value commodity that has potential to attract good prices and generate a profitable income (Banye, 2015). Furthermore, shea butter is an important ingredient of local cuisine as well as social and ritual life (Laube et al. 2017).

### **2.3.3 Shea Cosmetics and Medicine**

Products from the shea tree are used for medicinal purposes in different dimensions. Hatskevich *et al.* (2011) explain this in a number of ways. They maintain that the substance is used in healing effects on burns, skin conditions and stretch marks. It is known to be naturally rich in vitamin A and E for smooth, hydrate and balance skin. They add that, shea contains vegetable fats that promote cell regeneration and circulation making and therefore a healer and rejuvenator of ageing skin. In a cultural dimension, Hatskevich *et al.* (2011) reveal that the residue from shea after extracting the butter is an excellent fuel and can be mixed with mud for plastering traditional mud houses, while wood from shea is used as stools, hoes, pestles and mortar.

Shea has many other medicinal uses. The bark of the shea tree is used as medicine for treatment of stomach ache; and dry shea trees used as firewood (Adams et al. 2016; Amoako, 2012). Mostly the shea nuts can be sold or processed into butter which may be used for skin cream, or medicine (Carette et al. 2009). In summary, multiple parts of the shea tree can be used: the bark can be used as medicine, the leaves are used to make paint, the wood for utensils, furniture or as construction material. The coproducts of shea butter extraction can be used to mix with soil material for plastering. These coproducts can be used as fuel and the ashes that are left after burning can be used for the extraction of

alkaline. Shea butter is also sometimes mixed with different types of alkaline to make soap (Carette *et al.*, 2009). These different uses reduce household financial requirements thus suggesting that the shea nut industry can reduce poverty among rural people. Shea production helps reduce poverty through exports and increases food security among the population by providing subsistence (Osie, 2015).

#### **2.3.4 Woodfuel and Charcoal Producers**

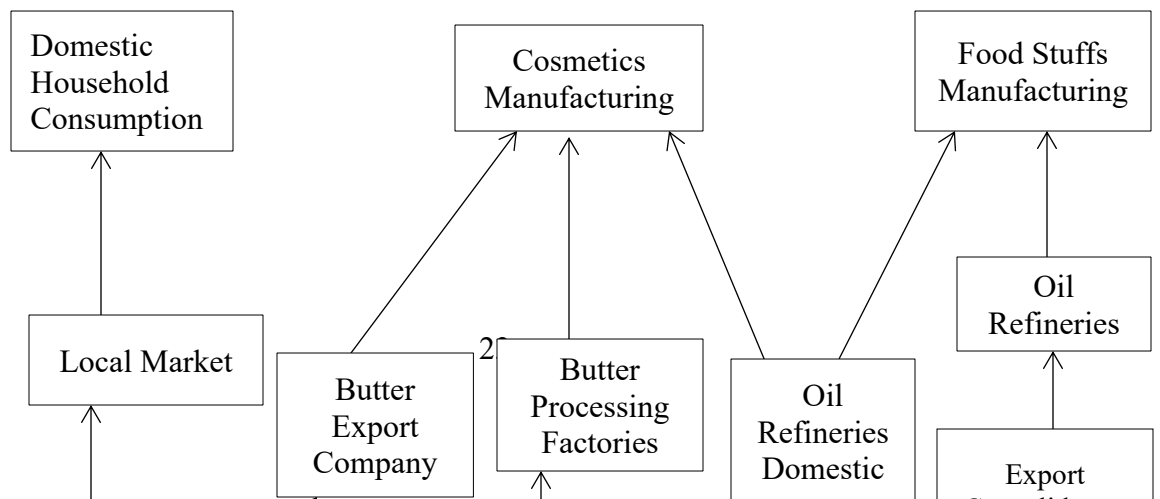
Throughout the shea belt of Africa, the shea nut tree continues to be exploited for charcoal production (Atalla, 2015; Rood). In Uganda, charcoal and fuelwood account for 92% of the national energy demand (Atalla, 2015). Similarly, Ghana depends on woodfuels as its main source of energy consumption especially in the rural communities (MLNR, 2016). Furthermore, the supply of woodfuels has come mainly from the natural forests; indeed more than 90 per cent of woodfuel consumed in Ghana has been estimated to be supplied from farmlands and natural forests within the transitional and savannah zones. Easy accessibility to charcoal and wood fuel products by the household accounts for the increase usage of these energy sources (Osie, 2015). Woodfuels are used for cooking and heating in households and in the commercial/service sectors and within the informal industrial sector like bread baking, palm oil processing, brewing of local drinks, tobacco curing, tie and dye production, fish smoking and soap making amongst others (MLNR, 2016). Rood (2017) discovered that the Shea is a primary source of wood for charcoal production, due to the perception that shea is the most efficient and robust fuel wood. This is in support of Osie (2015) claim that shea coal is the most preferred among others. In a study conducted in Varimpere in the Wa West district Osie (2015) indicated that shea was the most preferred species due to the quality of charcoal and wood fuel products it produces and also serve as

the means of revenue for the people (Osie, 2015). In the Wa West District of the Upper West Region, Osie (2015) noted that majority of the youth were engaged in charcoal and wood fuel production not as an option but a necessity due to the limited employment opportunities. This implies that shea trees that have been used as a livelihood option through picking of the nut but are cut down for charcoal production. This brings to the fore the conflicting use of shea trees in the district.

### **2.3.5 The Shea Value Chain**

Several activities are being performed by actors ranging from those who pick shea nuts from the bush to the final consumer. All the range of activities and services required to bring a product from its formation to sale in its final markets is value chain (Rammohan, 2010). Agroindustry materials therefore flow through several operational stages as they move from the farm through processing and then to the consumer. This according to Austin (1992) is referred to as Production chain linkages. The purpose of these activities in the chain is to add value to the raw materials. Consistent with this observation, Masters, Yidana & Lovett (2004) posit that shea butter thus has higher value than shea nut because processing of raw material into higher value end product is the most strain forward way of value addition. Trienekens (2011) therefore argues that value chains are seen as a vehicle by which new forms of production, technologies, logistics, labour and networks are introduced. By Kent and Bakaweri (2010) perspective, participation in this chain is understood as the level to which actors are part of the chain governance system and are therefore able to negotiate and influence decisions. Kent and Bakaweri (2010) therefore conclude that proper linkage between producers and the market is an integral element in upgrading the shea value chain. In line with this conclusion Trienekens (2011) further

argues that upgrading of value chains has several dimensions including processing upgrading which focus on product optimization through technological innovation. The principal actors of the shea value chain is shown in Figure 2.1.



Source: Kent and Bakaweri (2010)

**Figure 2. 1: The Shea Value Chain**

Principally, the actors in the shea value chain are nut pickers, processors and the traders. Carrette *et al*, (2009) report that, these actors are sellers/suppliers of shea, wholesalers, retailers and consumers who play succeeding roles along the chain. Kent and Bakaweri (2010) further explain that nuts are picked and processed mainly by women and sold onto the local market. Different range of actors including local butter processors and local nut traders buy it and sometimes export it. This is shown in figure 2.1. The figure shows the various activities performed from where the nuts are picked in the bush till it reaches the final consumer. In each activity some kind of value is being added till it reaches the consumer.



Wet nuts are collected by the nut pickers from the bush and depulped, this gives it the first value addition. This is then dried up and the shells removed into kennels before selling it to local nut traders, local butter processors, buyers for in-country processing and sometimes agents buying for export. The second stage of value addition is done by local shea butter processors. They extract the butter from the nuts and sell to the local market and the shea butter exporting companies. Oil refinery companies buy from local traders and extract the butter which then sells to the cosmetics as and food stuff manufacturing companies.

WATH (2004) further decomposes the processing factor into a series of activities though they may be performed by the same operator yet the concept of value addition still features in these stages. Basically the activities under processing include that of curing, extraction, refining, fractionation and manufacturing. The shea value chain therefore consists of several operational stages before the product reaches the final consumer. Upgrading of the chain is, therefore, necessary to enhance the livelihood of actors along the chain.

#### **2.4 Influence of Shea and Dawadawa trees utilization on rural livelihoods**

The shea tree is second most important oil crop in Africa after palm nut tree (Hatskevich, *et al*, 2011) which plays a major role in the livelihood of people in places where it is known to be dominated and even beyond. Shea therefore plays several roles in rural livelihood in different ways. Shea butter is consumed locally in producing regions as food, cosmetics, soaps and detergents, medicines, and for cultural and religious purposes (Seidu, 2012)

In Ghana, shea is a business for women and a source of income for many families and to some extent contribute in some cases more than half of annual income of households in the Upper West region in particular (Carette *et al*, 2009). Other empirical studies elsewhere in Africa share similar view with regard to the role of shea nut in livelihood. Ferris, *et al.* (2001) argue that, income from shea in Uganda is more than other major livelihood outcome such as brewing and farming. Households eat the fruits and the oil is considered as the only single source of cooking oil in some communities. Farris *et al* (2001) therefore explain that shea business is not just entirely for women only but involves other groups such as men and children. Consistent with this argument, Moore (2008) adds that, the use of the shea tree covers aspects of livelihood, poverty reduction through the selling of its products and food security through the fruit pulp and oil from the nut.

In the past and even recently, shea is not cultivated or planted by locally. The shea-trees grow in isolated areas and are usually found in forests, farms and compounds of locals (Okilne, 2017; Poudyal, 2009). The households owning certain plots of farmlands also have full tenure rights over shea trees therein (Poudyal, 2009). Recent studies indicated that access to shea trees in rural communities has become institutionalized since the commercialization of the shea trade (Laube, 2015). Men own the land on which Shea trees grow, but it is women who are primarily engaged in Shea production (Venturini *et al.*, 2016). This suggests that the shea tree does not require much care for its survival. However, their utilization will not be sustainable if people continue to use them for charcoal production.

What makes this crop special is that, other than with other crops, shea business is traditionally women's business and it is a source of income for many families living in rural areas (Carette *et al.*, 2009). Conversely, the social nature of shea tend to restrict work to women (Rood, 2017). The Shea value chain is not considered to be effectively organised, particularly from the perspective of foreign investors (Venturini *et al.*, 2016). The Shea industry has been considered as a traditional and undeveloped industry (Banye, 2015; Laube, 2015). It has operated for generation in an adhoc manner to detriment of key actors, poor rural women and their family (Kavaarpou, 2010). The shea industry is still mainly at peasant level that is a reason why the margins are often low (Carette et al. 2009). However, the shea industry has contributed to social benefits by way of women empowerment, capacity building and community transformation (Okine, 2017). The industry also has significant impact on the space economy and socio cultural lives of many people (Kavaarpou, 2010). Shea is known to target at least three of the major Sustainable Development Goals put forth by the United Nations for the 2015-2030 time period (Rood, 2017).

*Vitellaria paradoxa* as it is scientifically known, has become a resources in courtiers faced with by paradox of high economic growth and difficulty in eradicating poverty (Venturini *et al.* 2016; Banye, 2015). The shea industry according to Okine (2017) has provided economic opportunities in jobs, income, product output and market. Jamala *et al.* (2013) in the work on the socio economic contribution of shea in Nigeria indicated that the shea has provided not only an important support for sustainable rural development but also a way for livelihood support and maintaining livelihood security for the rural people. Kavaarpou (2010) establishes that the shea industry has significant impact on the space economy and

socio-cultural lives of the people of the three regions of the North of Ghana. Shea was found to be of significant importance for the rural people in the Upper West Region, as for many families income from shea contributed to a quarter or in some cases more than half of a yearly income of a household (Carette et al. 2009). In fact, the average income from shea business is higher than that of household income in the Upper West Region (Adams *et al.*, 2016).

Shea nut picking is an important part of the diversified local livelihood portfolios and deeply rooted in the local historical and cultural contexts (Laube, 2015; Laube et al. 2017). When the financial situation permits shea nuts are often stored and used for home consumption or sold when prices are higher. Carette et al. (2009) found in their study majority people in the Upper West Region would buy shea nuts in the picking season and sell in times when prices are higher, if they had the money to invest. The poorest farmers with failed harvests are forced to sell the nuts in the picking season when prices are low to buy food or pay for sudden medical costs or funeral costs. This is consistent with Laube (2015) study on global shea nut commodity chains and poverty eradication. Laube (2015) pointed out that the sale of shea nuts does provide a welcome source of income for rural women and poor rural households in Northern Ghana at a time of the year when resources are scarce. The sale of shea nuts therefore mitigates poverty to a considerable degree. Similar conclusion has been drawn in Laube and other researchers study on smallholder integration into the global shea nut commodity chain in northern Ghana (Laube et al. 2017). Shea butter is made from the processing of these shea nuts Jibreel *et al.* (2013) and is seen as livelihood diversification, food security, household asset accumulation, employment generation, financial savings for rural producers and sellers (Jamala *et al.* 2013). Rood

(2017) also stated that the butter processing is an environmentally friendly alternative for industrialized vegetable oils since the supply chain does not involve extensive use of fertilizers, pesticides, or cause substantial land use change (Rood, 2017). Additionally, the butter is an important ingredient in the local cuisine as well as in social and ritual life (Laube, 2015). Processing of shea butter is a way of life for many women in three northern regions of Ghana (Jibreel *et al.* 2013). In the South Eastern Adamawa State of Nigeria, Jamala *et al.* (2013) noted that though the people are not full time shea butter processors, shea butter business remain one of the major live occupation in support of livelihood. Yussif (2015) indicated that organizing these butter processors into group has economic benefits. This is because he discovered in study on a socio-economic analysis of the emerging shea value chain that, butter processors operating in groups get to process more kernels on average compared with processors who do so individually. They also enjoy economies of scale especially with regards to water, crushing and milling costs.

Charcoal production is an important economic activity in most rural areas in development countries, and an important source of energy in developing countries (Osie, 2015). Though charcoal production is unsustainable and destructive, it represents a quick source of domestic income from shea butter production, and in this way it reflects the level of rural poverty (Atalla, 2015; Osie, 2015).

Traditional knowledge on the use of diverse plant species, including how to prepare these plants for consumption, forms a critical base for household dietary diversity (Gamor *et al.* 2015). Production of dawadawa from locust bean traditional family art done by rural women in rather unhygienic conditions with inconsistency in quality (Oluwatoyin & Rahji, 2012). The seeds of *P. biglobosa* have been shown to contain up to 29% crude protein and

60% saccharose; it is also rich in vitamin C and high in oil content (Orwa et al., 2009). The seed of the African locust bean when boiled and fermented is known as “dawa-dawa” (Udo et al. 2016). The fermentation of African locust beans (*P. biglobosa*), initiated by *Bacillus* species to produce spices called “iru” or “dawadawa” had been described by several authors (Teye, et al. 2013; Ademola et al. 2015; Udo et al. 2016). Additionally, processing of African locust bean seed into dawadawa gives the product not only its peculiar aroma which enhances the taste and smell of several traditional dishes but also results in reducing level of antinutrients and improving its digestibility and nutritional value (Omafuvbe et al., 2004).

Dawadawa is commonly used in Ghanaian homes as flavour enhancers in varieties of meals (Teye, et al. 2015). It is one of the major sources of plant protein in African diet as well (Ademola et al. 2015). Dawadawa is significantly higher in minerals such as iron, calcium, copper, manganese, selenium and zinc (Alexander, 2015). As a result, its condiment, serves as a meat or protein source when there is no animal source of meat (Gamor et al. 2015). Alexander, (2015) argues that Dawadawa is not only used as flavouring agent but also adds protein to a protein-poor diet which could contribute to protein content in diet of human. In Nigeria, the most popularly consumed protein-rich foods include African locust bean (Wokoma & Aziagba, 2001). According to Udo et al. (2016), over 60 million Nigerians depend on the African locust bean for food, fuel as well as work working income.

## **2.5 The effect of Shea and Dawadawa trees utilization on the environment**

Achieving sustainable development through shea trade, Okine (2017) cited that environmental benefits are found in the shea industry by way of shea tree conservation, ecosystem benefits, and reduction in Ghana's Greenhouse Gas emissions and from environmental vulnerabilities. Charles (2015) observed that as a result of the numerous important livelihood outcomes from shea has encourage farmers into practicing conservation management of shea trees. While this is true, there is an increasing demands for food, energy, human habitat, and transportation and these have direct implications on the forestry sector (MLNR, 2016).

In like manner, as human population increases throughout the African continent, demand for fuel is expected to soar placing an exceedingly greater burden upon tree resources preferred by the charcoal industry. Ghana environmental resources for instance are becoming over exhausted specifically vegetation (Osie, 2015; Jibreel *et al.*, 2013). The driving forces of this phenomena (deforestation and forest degradation) have been agriculture expansion, illegal logging (chainsaw operation) and unauthorized mining (galamsey) operations in the forest areas, illicit and uncontrolled exploitation of wildlife, unsustainable production of woodfuel especially in the fragile ecological areas of the savannah regions and wildfires (MLNR, 2016). These are activities have detrimental effects on plants and animal life. Specifically, the majority of households whose lives depend on exploitation of economic trees will be threatened.

Evidence suggest that charcoal represents a significant portion of the domestic energy consumption in sub-Saharan Africa (Atalla, 2015). About 16 million m<sup>3</sup> of wood valued at about US\$200 million is consumed in various forms as energy per year: this accounts for about 86% of urban energy; in rural areas, woodfuel makes up more than 95% of energy consumption (MLNR, 2016). This high demand coupled with unsustainable production practices, conversion and end-use inefficiencies and waste will put the country's forest and woodland resources which supply bulk of wood fuel under intense pressure. Implying that, despite its contribution to livelihood, some of it utilization (charcoal production) account for the depletion of the vegetation (Osie, 2015). According to Charles (2015), the continuous extraction of shea resources from the natural plantation over the years without any significant conservation management measures has compounded the deforestation of the natural shea vegetation, leading to the fast decline in shea tree population in the northern savannah grasslands. Additionally, in the process of the extracting shea resources like charcoal, the grasses are lost, the heat from the earth mould kill off micro bacterial organisms in the soil rendering the soil infertile for a long time (Osie, 2015). In Sissala West District of the Upper West Region, Fagariba and Wusu – Brempong (2016) realised that one of the main economic activities of the indigenes charcoal burning, which result in destroying large areas of land because they do not take any measures to conserve the forest in search of their daily bread.

Not only have these activities led to the depletion of the environment but also most of the indigenous species like, the shea have drastically reduced (MLNR, 2016). Research had it that the shea tree is greatly threatened by unregulated charcoal production activities



throughout sub-Saharan Africa (Atalla, 2015). As a matter of fact, activities of charcoal production in Varimpere is refusal to environmental conservation strategies in Ghana (Osie, 2015). Aside the charcoal related factors, there are many physical factors that influence shea tree yield like weather, bush fires (natural and man-made), drought, caterpillar plagues and pruning. On a longer term anthropogenic selection of the trees, the age and regeneration influence the shea nut yield (Carette *et al.*, 2009). In line with the man-made factors Charles (2015) indicated that despite the fact that individuals and communities may have general knowledge in the importance of most of the shea and its conservation management practices, they either lacked the capacity to practice shea conservation management. Others include, population growth, high illiteracy rate, poverty, hunger and lack of alternative economic livelihoods were perceived as the underlying causes of deforestation (Fagariba & Wusu – Brempong 2016). With regards to fire related causes, farmers often use fires in their farming process which has implications for the sustenance of flora and fauna in the community (Osie, 2015).

On the other hand, the bio-product of the shea butter has been found to have a greater effect on the environment. In the Tamale metropolis of Ghana where most women are engaged in shea business, Jibreel *et al.* (2013) established that the adverse impacts of the processing of shea butter on the environment relate with the large volume of water used in the processing which is scarce, changes in the soil structure at disposal location, inhibition of plant growth and cutting down of trees which lead to deforestation (Jibreel *et al.*, 2013). The foregoing discussion implies that the utilization of shea trees without sustainable measures can lead to a threat to bio-diversity loss with its consequences on human life.

## **2.6 Role of Governments in promoting shea production**

Different rules governing access to trees within the community and within individual families on different types of land have been institutionalised. For example, many women lack exclusive access to shea trees and have to share trees with female relatives or are forced to pick from the bush where bush land is still available. But even with access to ample sources of shea nuts, women are limited by the time available for this activity (Laube *et al.*, 2017). The Shea tree is considered an endangered species, and is protected by the National Forestry Code of Burkina Faso and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) ((Venturini *et al.*, 2016). Be that as it may, the story is different in Uganda. Uganda lacks a national law for the conservation of the shea nut tree and for the regulation of the charcoal trade. Although the shea nut tree has the untapped potential to augment the regional economy of northern Uganda, its conservation status has not been adequately addressed (Atalla, 2015). The Forestry Services Division of Ghana whose role is to regulate the cutting of trees was found by Osie (2015) not to playing this role. As a result, the environmental laws protecting the planting of trees are not implemented and therefore most dweller do know have any ideas about these laws. This suggests that despite the existence of regulations to govern plant species in Ghana, implementation bottlenecks have led the shea trees species at risk of extinction.

Atalla (2015) in a review of institutional framework for conservation of the shea tree in Uganda highlighted the need for national policies with clear implementation strategies to guide regional and national intervention to conserve the shea tree. Of course, not only in

Uganda, but countries like Ghana and others of the shea belt have to make the shea industry a key avenue towards the achievement of Sustainable Development Goal (SDGs) 1 and aspiration 1 of African Agenda 2063 and aspiration 1 and several SDG (Okine, 2017). In 2009, Carette *et al.* (2009) did a study on shea nut and butter in Ghana and reported that the government is not actively supporting exporters of the products, and the government doesn't keep track on amounts of butter produced and exported. Despite that, they revealed that the government of Ghana is involved through a number of departments; The Cocoa board, the ministry of trade and industry, the Ghana standards board and the Ghana export promotion council in the trade of shea. The cocoa board is responsible for cocoa as well as for shea and cashew. The Cocoa Research Institute of Ghana (CRIG) is part of the cocoa board and is doing research on shea as well. Under the ministry of trade and industry there are a number of boards who execute the policy of the MoTi. Those boards are the Ghana export promotion council, the Ghana standards board and the NBSSI (National Board for Small Scale Industries). In Ghana the GEPC is responsible for recording quantities traded over the boarders. The GSB is responsible for the guaranty of the quality of the products. Also, advocates for gender equity and sustainable development think that shea has the potential to improve the quality of life for female producers (Rood, 2017). However, their influence on sustaining the shea industry has not been discussed by empirical studies.

## **2.7 The Conceptual Framework**

The study adopted the conceptual framework developed by the Department for International Development (DFID, 1999). The framework explains the relationship among different variables such as livelihood assets, livelihood strategies and livelihood outcome.

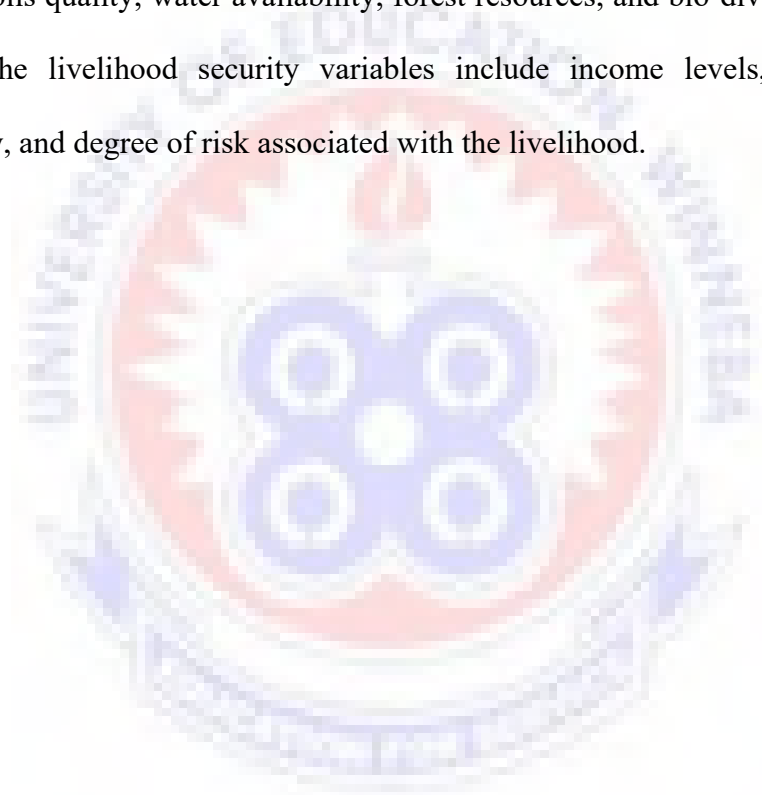
As shown in Figure 2.2, the various livelihood assets include natural capital, physical capital, human capital, financial capital, and social capital. These livelihood assets are shaped by interrelationships of variables including institutions, organizations and social relations.

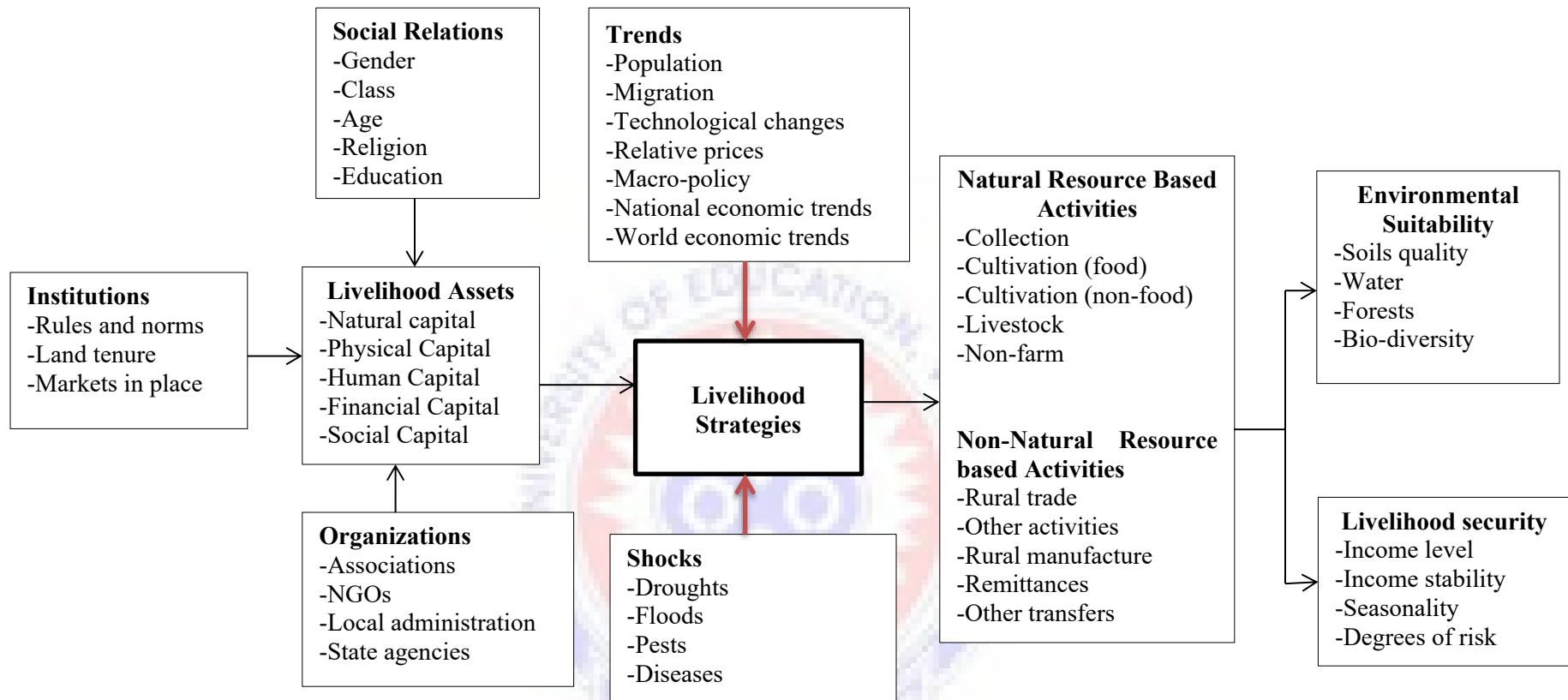
Households often drive their livelihood strategies from their immediate livelihood assets. Their strategies are usually in the form of primary, secondary and tertiary production activities. However, in the hinterlands, majority of the households are engaged in primary production activities such as agriculture, fruit gathering, and logging. From Figure 2.2, the livelihood strategies can be influenced by climatic shocks such as droughts, floods, pest and diseases that affect both plant and animal life. Besides, economic, social, and technological changes can shape households' livelihoods. This can take different trends such as population dynamics, migration, price volatility, economic policy, and the effect of the international market. These variables are the external factors that change household livelihood strategies.

The livelihood outcomes are twofold: (1) natural resource based activities, and (2) non-natural resource based activities. The natural resource based activities are the direct primary production activities engaged in by the households. Examples include the collection (of firewood), cultivation of food crops, cultivation of non-food crops such as timber, cotton among others. Others include livestock rearing, and non-farm activities. Secondly, the non-natural resource based activities include rural trade, rural infrastructure, and remittances.

The framework implies that households who are engaged in livelihood activities often measure their outcomes in terms of the natural and non-natural resource activities.

Finally, the framework in Figure 2.2 provides an indication of the effects of the livelihood outcome. DFID (1999) suggests two main livelihood effects which include environmental sustainability, and livelihood security. The environmental sustainability is measured in terms of soils quality, water availability, forest resources, and bio-diversity conservation. Besides, the livelihood security variables include income levels, income stability, seasonality, and degree of risk associated with the livelihood.





Source: DFID (1999)

**Figure 2. 2: Conceptual Framework**

The framework in Figure 2.2 implies that households in the Wa West District may utilize their available natural resources as establish their livelihood strategies. A proxy of this in this study is the utilization of economic trees such as shea and dawadawa. The utilization can take different forms such as fruit gathering, woodfuel gathering, charcoal production, and logging. Besides, the effective utilization of these resources (natural assets) will be influence by the existing organisations such private sector institutions, NGOs, and state institution intervention. For example, these institutions may advocate for sustainable development with activities of environmental conservation. On the other hand, droughts, pest, diseases, and bush fires can emerge as threats in the utilization of these resources and this will require appropriate intervention by individuals and state to minimise their effects. The framework also suggests that effective institutions such as rules and norms in the communities, land tenure and market place variables can protect the economic trees and hence sustainable utilization. On the other hand, macroeconomic policies, population trend such as migration, and relative prices can shape the method of utilization of the natural resources such as the economic trees to have sustainable livelihoods.

The utilization of economic resources such as shea trees will result in different outcomes such as those related to natural resource base activities and non-natural resouces base activities. The overall impact will be in the form of environmental sustainability such as bio-diversity loss/conservation, and livelihood security such as income sustainability or income loss among a segment of the population.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter presents a description of the general procedures used in carrying out the study. It deals with a description of the study area, the research design, the study population, sampling size and sampling procedure, sources of data, instruments of data collection, validity of the instruments, ethics in data collection and the methods of data analysis.

#### 3.2 Study Area

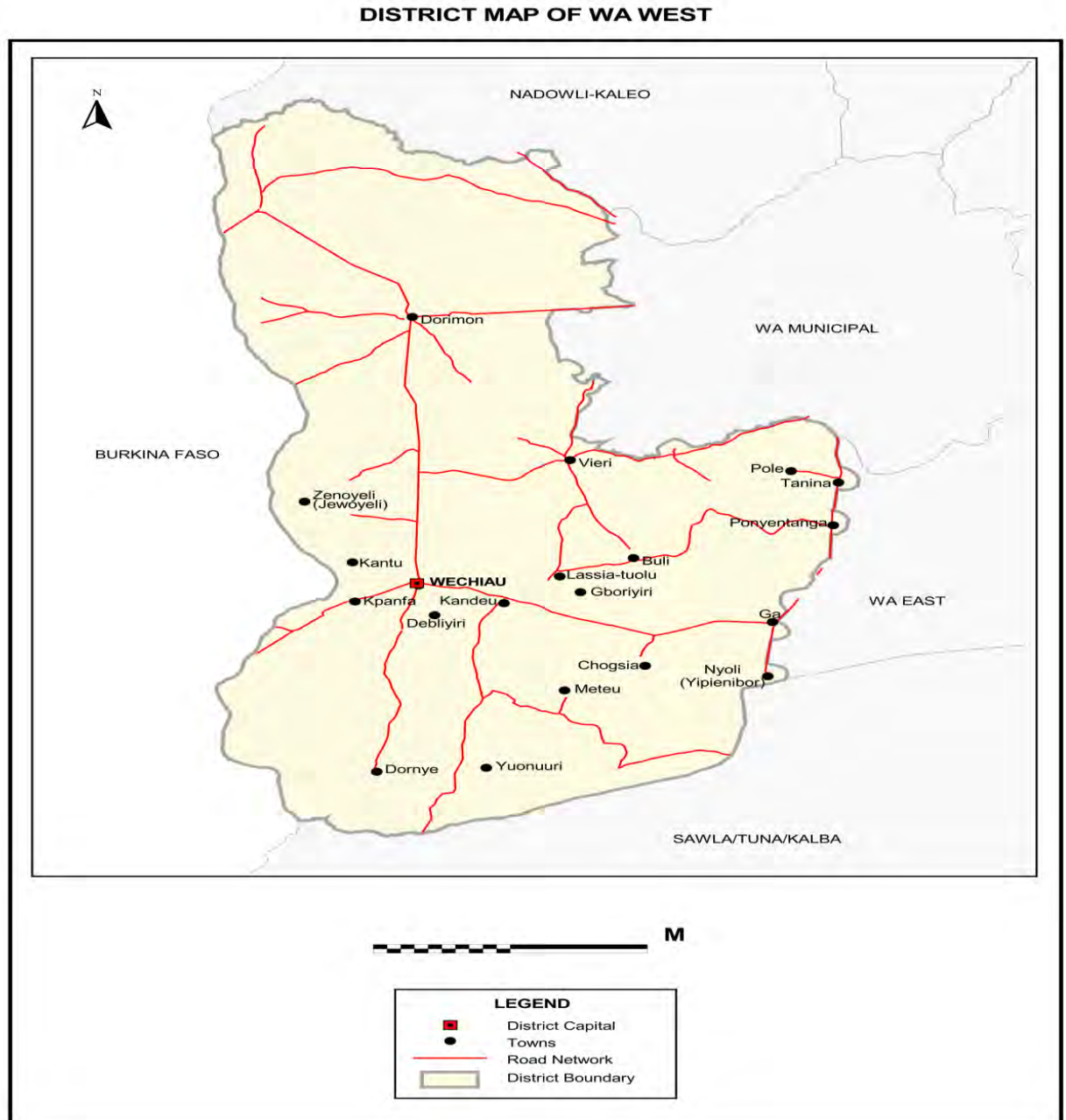
The Wa West District was carved out of Wa District in 2004 by legislative instrument (LI 1751) under the Local Government Act 463, 1993. Wechiau is the capital of the District. The District has 27 electoral areas and 5 area councils and is headed by District Chief Executive as the political leader. The Wa West District has only two paramountcies: Wechiau and Dorimon with titles 'Wechiau Naa' and 'Dorimon Naa' respectively. There are also divisional and sub-divisional chiefs under the authority of the two paramountcies (Ghana Statistical Service, 2014).

The District is located in the western part of the Upper West Region, approximately between longitudes 9° 40' N and 10° 10' N and also between latitudes 2° 20' W and 2° 50' W. It shares borders to the south with Northern Region, north-west by Nadowli District, east by Wa Municipal and to the west by Burkina Faso.



The physical, social and economic activities of the Dorimon traditional Area is not different from that of the whole district. The vegetation is one of the Guinea Savannah grassland type; made up of short trees with little or no canopy and shrubs of varying heights and luxuriance, with grass ground cover in the wet season. Commonly found trees are the shea, dawadawa, kapok and baobab. Cashew and mango are exotic species that also grow well in the area (Ghana Statistical Service, 2014). This provides different livelihoods for households through farming, charcoal production, logging, and firewood harvesting/gathering.

The major economic activities in the District include agriculture, rural commerce and industry, tourism and social services. Agriculture accounts for 86.0% of district's economy. The predominant agriculture activity is farming. Most farmers undertake a combination of crops and animal production. The main crops grown are maize, millet, cowpea and groundnut. The District has comparative advantage in groundnuts and cowpea production (Ghana Statistical Service, 2014).



**Figure 1.1: Map of Wa West District**

### 3.3 Research Design

A research design is the determination and statement of general research or strategy adopted for a particular project (Creswell, 2014; Kumar, 2011). It is the heart of planning,

a blueprint or set of plans for carrying out the study (Leary, 2001). The design explains the method of enquiry, the objective and the approach (Kumar, 2011). Several research designs are available for social scientist such as explorative, descriptive, survey, case studies among others (Kumar, 2011; Neuman, 2014).

This study will be a descriptive study. According to Kothari (2004), a descriptive study portrays accurately the characteristics of a particular individual, situation or a group. The main characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening (Cohen et al., 2007). This study aims at describing how economic trees such as Shea and Dawadawa are being utilized to enhance household livelihood and the effects of that on the environment.

The research approach will be a mixed method which is explained by Creswell (2014) as an enquiry based on the use of both qualitative and quantitative methods. Mixed method strategy allows the researcher to be flexible in the measurement of variables and hence discusses the results using different paradigms (Neuman, 2014). The qualitative aspect of this study will consist of interviews for stakeholders (both locally and regional) who are in charge of environmental management and conservation. On the other hand, the quantitative aspect of the study will consist of the responses from households on the use of economic trees and their effects on livelihood and the environment.

### 3.3 Study population

The population of the study will consist of household heads in the Wa West District. From the 2010 Population and Housing Census, the whole Wa West District had a total of 11486 households (Ghana Statistical Service, 2014). Households were considered as part of the study population because they utilise Shea and Dawadawa trees for their livelihoods or their livelihoods were affected by the utilization of these trees. Primarily, household heads will be considered as the respondents since they take major economic households decision. Other categories of people who utilize economic trees include Group of Charcoal producers, and Chain saw operators. Their activities are very important in the analysis of economic trees utilization and hence were included in the target population of the study. The study population will also include stakeholders such as the Chief and elders, the assembly persons in the Wa West District, and the Environmental Protection Agency of the Upper West Region. These categories of people are the major stakeholders responsible for protecting the environment.

### 3.4 Sampling

This section describes the sample size determination and the procedure for selecting the respondents.

#### *Sample size determination*

The sample size for the study was determined using the formula specified by Cochran (1977) as:

$$n = \frac{Z^2 * P(1 - P)}{M^2}$$

Where;

$n$  = Required Sample Size

$Z$  = Confidence level at 95% (standard value of 1.96)

$P$  = Estimated prevalence of respondents' in the population

$M$  = Margin of error at 5% (standard value of 0.05)

The value of  $P$  (proportion of households in with livelihood linked to agriculture and economic trees) is 86%. This means that the proportion with licence ( $1 - p$ ) is 14%. Hence the require sample size is:

$$n = \frac{1.96^2 * 0.86(1 - 0.14)}{0.05^2}$$

$$n = \frac{3.8416 * 0.1204}{0.0025}$$

$$n = 185$$

Hence 185 household heads were selected in the Wa West District for investigation into their utilization of Shea and Dawafawa trees.

Besides, some groups of people were also relevant for the study because of their in-depth knowledge on the utilization of economic trees. They include the Traditional leaders, Assembly members, Group of Charcoal producers, and Chain saw operators. The Environmental Protection Unit and the Forestry Commission under the Wa West District Assembly will be included in the study.

### ***Procedure for selection***

Sampling procedures are classified into probability and non-probability methods. In probability sampling, each unit of the population has equal chance of being selected while in non-probability sampling, the units of analysis do not have equal chance of being selected (Panneerselvam, 2007). In this study, both probability and non-probability sampling were used in the selection of respondents. Specifically, probability sampling was used to select households while non-probability sampling was used to select heads traditional leaders, assembly members, and EPA staff.

Specifically, a multi-stage sampling procedure was used to select households. The first stage involved the selection of communities and the second stage the selection of household heads. Five (5) communities were selected at random, and 37 respondents (household heads) selected from each of the selected communities. The selected communities include Dorimon, Vieri, Donye, Yuonuuri, and Siiriyiri. In each community, the sampling frame was generated using the house numbering system and the respondent selected at random.

Besides, purposive sampling technique was used to select the major stakeholders. The use of purposive sampling is justified by the fact that the respondents have in-depth knowledge on the issues under investigation.

### **3.5 Types and sources of data**

Basically, only primary data were required in the study. Primary data are first-hand information obtained from respondents. The primary data were obtained from households'

heads and the stakeholders included in the sample. The data covered issues such as actors and methods of Shea and Dawadawa trees utilization, the influences of economic trees utilization on the livelihoods of households, and the effect of economic trees utilization on the environment.

### **3.6 Instruments for data collection**

Ofori and Dampson (2011) maintain that studies that use only one source of evidence produce poor results. This study therefore used multiple tools consisting of a questionnaire, interview and Focus Group Discussion as the instruments of data collection. The use of these tools provided both quantitative and qualitative data for further analysis.

#### **3.6.1 Questionnaire**

A questionnaire was used to gather data from household heads. The questionnaire comprised of both closed-ended and open-ended questions which allows for the collection of both quantitative and qualitative data. According to Twumasi (2001), as a method of data collection, the questionnaire is an efficient way to collect large statistically quantifiable information. In this study, 185 household heads were contacted for investigation. The relatively large sample size in this study also justifies the use of a questionnaire as a data collection tool. The questionnaire contained variables on background information of respondents, actors and methods of Shea and Dawadawa trees utilization, the influence of these trees utilization on households' livelihoods, and the effects of trees utilization on the environment.

### **3.6.2 Interviews**

Face-to-Face interview is the most commonly used technique for conducting a systematic inquiry and most social researchers regard it as a window on the world (Holstein & Gubrium, 1999). This study used interview schedule which serves as a guide in conducting a face-to-face interview on the field. In this study, the head of Environmental Protection Agency, and Assemblymen were engaged in a semi-structured interview where some pre-determined questions were asked in a systematic and consistent order. The focus of this was on gathering data on the effects of Shea and Dawadawa trees utilization on the environment.

### **3.6.3 Focus Group Discussion**

Focus Group Discussion is a form of strategy in qualitative research in which attitudes, opinions or perceptions towards an issue, product, service or programme are explored through a free and open discussion between members of a group and the researcher (Kumar, 2011). It takes a form of group interview in which there are several participants in addition to the moderator/facilitator (Ofori & Dampson, 2011). There is emphasis in the questioning on a particular fairly tightly defined topic and the goal is upon interaction within the group. Tayie (2005) also indicates that in Focus Group Discussion, from 6 to 12 people are interviewed simultaneously, with a moderator leading the respondents in a relatively free discussion about the focal topic. In this study, the traditional leaders, farmer groups, charcoal producers (groups), Chain saw operators, and firewood gatherers were engaged in a Focus Group Discussions. The purpose was to identify the actors and their relationships



in economic trees utilization, and the effects of economic trees utilization on livelihoods and the environment.

### **3.7 Validity and reliability**

Both validity and reliability are essential component of any research whether quantitative or qualitative in nature and are the two most important and fundamental characteristics of any measurement procedure. Besides, it is prudent for testing validity and reliability of research instrument used in collecting data for the study of this nature cannot be overlooked.

Cohen *et al.* (2007) posit that validity refers to the extent to which the research instrument records what is intended to record. Neuman (2014) also supported the idea on validity to mean truth that can be applied to the logical tightness of experimental design, the ability to generalize findings outside the study, the quality of measurement and proper use of procedures. Validity actually concerns with the accuracy of measurement. Validity is defined as the degree to which a measuring instrument measures what it is designed to measure (Neuman, 2006). To find out the validity of items and the instrument used, the following questions were examined:

- Whether the questions on the instruments relate to the research questions;
- How comprehensive they will be;
- Whether they will solicit the appropriate responses;
- If instruction or directions are clear;
- Whether the vocabulary or sentence structure will be up to standard;

- Whether the items will be properly arranged;
- Whether the items will fit into sections they will be placed;
- Whether any of the items will be ambiguous and misleading. This was corrected through pre-testing of the instrument.

On the other hand, reliability of an instrument is concerned with the consistency of the instrument. Thus reliability refers to the extent to which an instrument measures the same way each time it is used under same conditions with same objects. According to Neuman (2014), reliability is the dependability or consistency of the measure of a variable. In order to ensure validity and reliability of research instrument, Burns (2000), stated that “research has a great investment in validity and reliability”. In research the term reliability means ‘repeatability’ or ‘consistency’. A measure would be considered reliable if it will give us the same result over and over again (assuming that what will be measured will not be changing). Consistency of the questionnaire was ensure through pre-testing.

### **3.8 Ethical consideration**

Ethical matters or considerations are very important for every research adventure or study (McNamara, 1994). This is most important for studies that involve the use of human subjects. Participants have a right to know what the research is about, how it will affect them, the risks and benefits of participation and the fact that they have the right to decline to participate if they choose to do so. Respondents were assured the maximum confidentiality that the data is required for academic purpose only. Ensuring anonymity and trust with the participants will help to establish greater content validity (Cox, 1992). In this study, the participants were instructed not to write their names or any identifiable details to enhance their anonymity. The data were collected for the research stored and

handled in a professional manner in order not to identify individual participants or any information that could lead to identifying individual respondents in the discussion of the research results.

They respondents were also briefed on the possible impact of the study. According to Creswell (2005), gaining access involves obtaining permission to sites and individual and negotiating approval with these individuals at a site who can facilitate the collection of research data. To gain access to the key informants, a letter of introduction was obtained from the University for Education, Winneba to convince respondents on the purpose of the study.

### **3.9 Methods of data analysis**

The data were analysed using both qualitative and quantitative methods. The completed questionnaire from respondents were edited and coded to facilitate easy identification. The quantitative data were entered into the SPSS spread sheet for analysis. Descriptive statistics was used to present the results of the analysis. The results were presented in tables and graphs.

The qualitative data were sorted into similar themes and discussed. Other detailed descriptions and explanations were also used to analyse qualitative data. Results from the interviews and focus group discussions were summarized in the form of direct quotations from respondents.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This study investigated the utilization of Shea and Dawadawa trees in the Wa West District of the Upper West Region of Ghana. Several variables were analysed with much focus on the objectives under investigation. First, analysis and presentation of the results was done under the background information of the respondents. Other sections of the chapter presents analysis and discussion of information about actors of economic trees utilization, the impact of economic trees utilization on households, as well as the environmental impact of economic trees utilization.

#### **4.2 Demographic Information of Respondents**

This section presents the demographic characteristics of the respondents. The demographic information of the respondents was based on gender, age, ethnicity, marital status, household size, religion, level of education and occupation. Their standard of living was also measured using the annual income.

##### **4.2.1 Gender of the Respondents**

The respondents of the study consist of both male and female. A total of one hundred and eighty five (185) household respondents (heads) were targeted. In terms of the gender distribution of these household heads, the data as shown in the Table 4.1 revealed that majority of them (62.2%) were males and the remaining 37.8% were females.

**Table 4. 1: Gender Distribution of Respondents**

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	115	62.2
Female	70	37.8
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

The results in Table 4.1 revealed that households in the Wa West District are dominated by male headship. Similar findings are reported on the distribution of household heads in the Wa West District. The Ghana Statistical Service (2014) reported 60% male household heads and 40% female household heads. This appears not to be the case in Ghanaian societies since most of the households are headed by males. What happens in the case of the Wa West is that some households consist of single members and in cases where such members are females; they automatically become heads of the families. As a result, female are responsible for taking the household decisions in the absence of adult male household members. This implies that many households decision especially with regard to livelihood decisions will be preceded over by male in the households. As indicated in Ghana Statistical Service (2014) households heads in northern Ghana are charged with the responsibility of proving basic needs of the household members such as food shelter and clothing. This means that the livelihood activities to engage to be able to provide these will be determined by males in the area.

#### **4.2.2 Age of Respondents**

Age of respondent is considered as an important demographic variable that need an attention in this study. It was discovered that household heads have different age categories.

Out of the one hundred and eighty five household heads sampled in this study, the minimum age recorded was 22 years and the maximum age recorded was 73 years. From the descriptive statistics the average age was recorded as 41.46 with 14.747 as the standard deviation (see Appendix).

Besides, the distribution of the age categories in Table 4.2 shows that 36.2% of the respondents have their ages falling between 21-30 years, 23.8% have their ages between 31-40 years and 17.3% have their ages between 41-50 years. The distribution also indicates that only 4.3% have their ages between 51-60 years and 18.4% have their ages above 61 years. Majority of the household heads have their ages between 21-30 years. This means that the mean of the distribution (22 years) fall within the modal class (21-30 years).

**Table 4. 2: Age of respondents**

<b>Age Category</b>	<b>Frequency</b>	<b>Percent</b>
21-30	67	36.2
31-40	44	23.8
41-50	32	17.3
51-60	8	4.3
61 +	34	18.4
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

The minimum and maximum age statistics recorded implies that all the respondents are matured enough to take household decisions but are also not too old to engage in household planning. Despite the fact that the maximum age of some respondents is 73 and would be

considered to have passed the retirement age in Ghana, yet people in the rural areas do engage in productive activities with such age ranges. For example Laube (2015) study on shea value chain in northern Ghana reported the mean age of respondents in Dorimon (one of this study communities) to be 44.8 years and this is relatively higher than what has been reported in this study. This means that people in their old ages can still contribute to the production process especially, in the utilization of economic trees.

#### 4.2.3 Ethnic Background of Household Heads

The analysis of demographic background of the respondents includes the ethnic background of people in the study area. Respondents were therefore required to indicate their ethnicity. It was discovered that three ethnic group namely the Waala, Dagaaba and Brifor were found in this study with majority of the respondents (39.5%) belonging to the Waala group, 33.5% belonging to the Dagaaba group and 27% belonging to Brifor. The distribution of respondents' ethnic characteristics is shown in Table 4.3.

**Table 4. 3: Respondents Ethnicity**

<b>Ethnicity</b>	<b>Frequency</b>	<b>Percent</b>
Waala	73	39.5
Dagaaba	62	33.5
Brifor	50	27.0
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

The results imply that different ethnicity may have different implications for their livelihood activities because of differences in their way of life (culture). Besides people

from different areas will have different ways of exploiting economic trees base on the livelihood strategies of their generations.

#### 4.2.4 Marital Status of the Respondents

Another demographic factor considered in this study was the marital status of the household heads. The results shows that majority (80.5%) of the respondents are married while only 19.5% remain single as shown in Table 4.4.

**Table 4. 4: Marital Status of Respondents**

<b>Marital Status</b>	<b>Frequency</b>	<b>Percent</b>
Married	149	80.5
Single	36	19.5
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

Majority of the respondents are married and currently staying with their spouses. This means that they would have to engage in livelihood activities to support their families. This suggests that such household will engage in activities related to the utilization of their immediate natural resources. It is therefore, expected that utilization of economic trees such as shea and dawadawa will be one of the key alternative for most families.

#### 4.2.5 Household Size

Household size in this is measured as the number of people with the same family under the headship of a single member. The data shows that the minimum household size of the 185 respondents who took part in this survey was 3 and the maximum size was 43. Statistically,



the average household size of the people who took part in this study was 11.58 and the standard deviation is 10.025 as shown in table 4.5.

**Table 4. 5: Household Size**

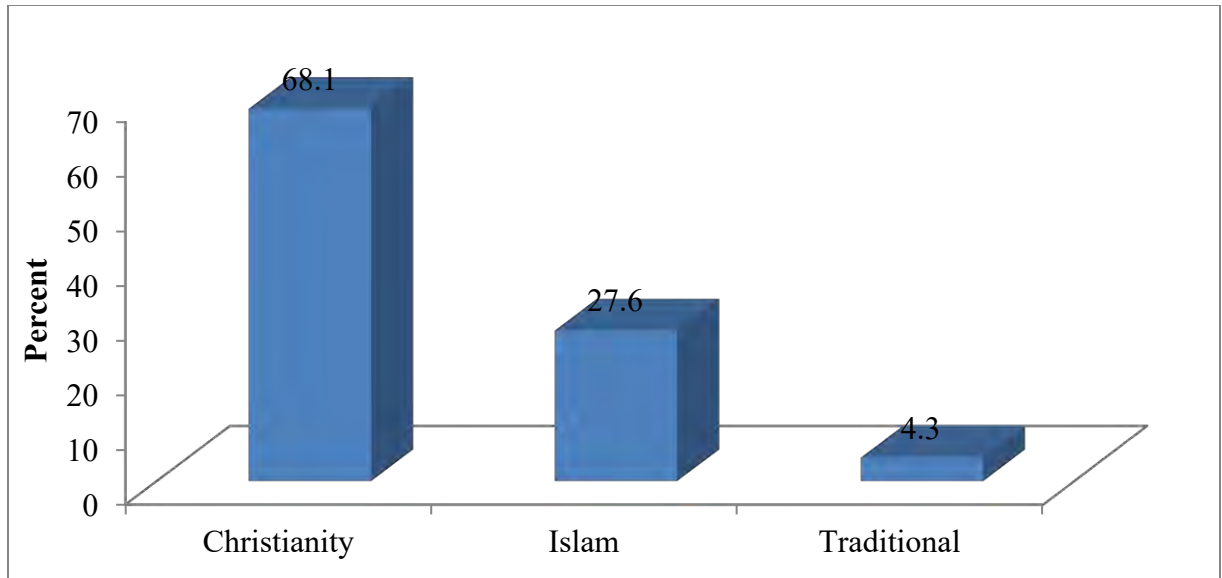
<b>Variable</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Household Size	185	3	43	11.58	10.025

Source: Field Survey, 2018

The average household in discovered suggests that the Wa West District has large household size since this is higher than the national, regional and district average. This means that households will be overburden and hence likely to have challenges in providing for the needs of household members. This expected economic challenge may lead to the overexploitation of economic resource es such as trees that are found in their immediate environment. It has earlier been established that some respondents are not married yet the minimum household size is 3, and this suggests that extended family system prevails in the Wa West District where an individual household member will have household burden even when the person is not yet married with children. This can worsen their economic burden leading to over exploitation of natural resources.

#### **4.2.6 Religious affiliations of Respondents**

An insight into the religious background of the respondents' shows that, the study area comprised mainly Christians, Muslims and worshipers of African Traditional religion. As shown in Figure 4.1, 126 respondents (68.1%) were Christians, 51 respondents (27.6%) were found to be people who belief and practice the Islamic religion while 8 respondents (4.3%) were found to belong to African Traditional Religion.



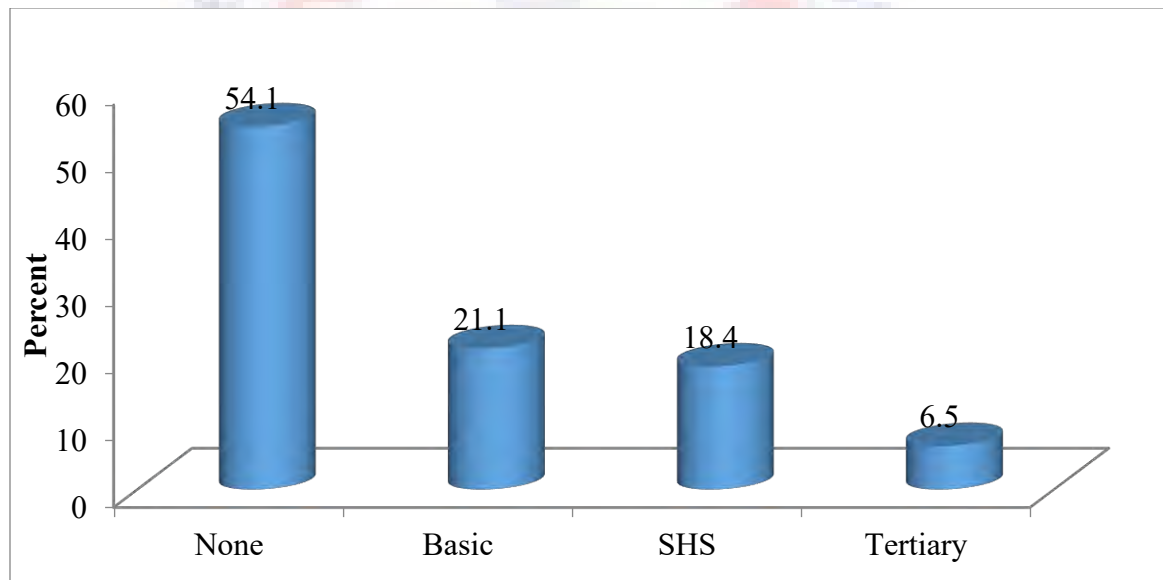
Source: Field Survey, 2018

**Figure. 4. 1: Religion of Respondents**

The results in Figure 4.1 show that Christianity dominates among the respondents while the religion that constitutes the least number of people is the Traditional religion. The culture of the people, specifically, their way of livelihoods and utilization of economic resources such as trees will invariably be influenced by their religious practices. For example, the belief that trees may contain some spirits and should not be cut down as often held by most traditional religious worshipers can lead to conservation of some economic trees. However, the fact that majority of the respondents are Christians followed by Muslims means that relatively large number of people will not share this belief and hence can exploit economic trees without any fear of spiritual consequences.

#### 4.2.7 Level of Education

The respondents were found to have different levels of formal educational attainment. The categories of education attained include those with no form of formal education, those with basic education, Senior High (SHS) level and those who have attained tertiary level of education. From Figure 4.2, 100 respondents who represents 54.1% of the sample were the category of respondents with no form of formal educational attainment. The figure also shows that 21.1% (39 respondents) have attained basic education as their highest qualification, 18.4% (34 respondents) have attained Senior High School as their highest educational qualification while 6.5% (12 respondents) have received formal education up to the tertiary level.



Source: Field Survey, 2018

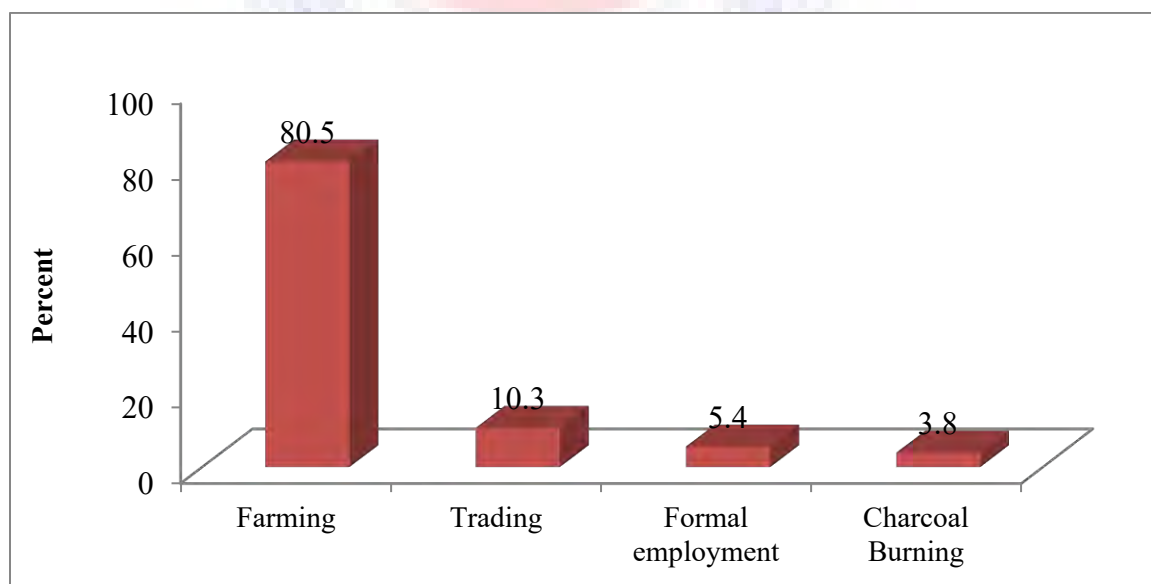
**Figure. 4. 2: Respondents Formal Education Attainment**

The results on respondents' level of formal education attainment show that majority of the households heads do not have any form of formal education. This means that many people

will not be able to read and understand natural resource conservation strategies and policies that could enhance the preservation of economic trees such as shea and dawadawa. The fact that majority of the people are illiterate means that stakeholders in natural resource conservation are likely to encounter challenges in resource utilization in the Wa West District. However, the remaining respondents have at least received basic education to enable them understand basic issues on policies on resource conservation.

#### 4.2.8 Household Heads Main Occupation

The respondents were asked to indicate their main occupations and the results revealed that farming, trading, formal employment (Teaching, health service, and security services) and charcoal burning are the main livelihood activities of households in the Wa West District. Figure 4.3 indicates that 80.5% (149 respondents) are engaged in farming, 10.3% (19 respondents) are engaged in trading, 5.4% (10 respondents) are formal sector employees, and 3.8% (7 respondents) are charcoal producers.



Source: Field Survey, 2018

**Figure. 4. 3: Respondents Main occupation**

The results in Figure 4.3 revealed that majority of the respondents are engaged in primary production activities which consist of farming and charcoal production. Among the primary production activities, farming is the main activity that has been engaged in by majority of the respondents. This means that the primary production activities as discovered by this study will have conflicting utilization of economic resources since charcoal production in an unsustainable manner could have negative effects on agricultural activities. There is no evidence of secondary production activities such as process as a major occupation. The results also suggest that some households are engaged in tertiary production activities and this consist of those employed in the formal sector or engaged in trading. The fact that majority of the respondents are farmers means that inefficient utilization of economic trees will affect their livelihoods such as poor soils for their production activities. On the other hand, those who are employed in the formal sector may not have their activities destroying the environment since their occupations are often regulated by government policies.

Further enquiry was made on whether the respondents do engage in alternative livelihoods activities besides their main occupations. It was discovered as shown in Table 4.6 that 55 respondents who represent 29.7% of the sample maintained that they engage other activities besides the main occupation to support their livelihoods while 130 respondents do not engage in any other occupation themselves.

**Table 4. 6: Engagement in Minor Occupation**

<b>Engagement in Minor Occupation</b>	<b>Frequency</b>	<b>Percent</b>
Yes	55	29.7
No	130	70.3
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey (2018)

However, the respondents who do not engaged in other minor occupations do not mean neither of their household members does not also engage in them. The fact that some people engage in minor occupations means that households in the Wa West District do have alternative livelihood activities to support their main occupations. This is usually common among farmers who may engage in off-farm livelihood activities to augment their seasonal production activities.

#### **4.2.9 Annual Income of Household Heads**

The study enquired about the annual income of respondents from both their major and minor occupation. From the Table 4.7 the minimum annual income from the respondent's main occupation is GH¢600 and the maximum income is Gh¢18000. Averagely, the respondent's income of the respondents was GH¢3890.42. From the minor income, the minimum income of the 48 respondents was GH¢300 and the maximum is GH¢5000. The main income from the 48 respondent's minor income is GH¢1816.67 with 1947.648.

**Table 4. 7: Distribution of Household Annual Income**

<b>Annual income</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Main occupation	600	18000	3890.42	4969.831
Minor occupation	300	5000	1816.67	1947.648

Source: Field Survey, 2018

The average annual household income is relatively low and this will not be sufficient enough in meeting the basic households' needs. This will compel many households to engage in the utilization of economic resources such as trees from their immediate environment.

#### **4.3 Actors in the Utilization of Economic Trees**

The actors in economic trees utilization in this study referred to household members or any other person who destruct or make good use of the economic trees in their daily activities. Some of these activities as identified in this study include; dawadawa processing, shea nut picking, processing and selling, Shea butter processes and soap making, medication, firewood gathering, tree logging and charcoal burning/production.

##### **4.3.1 Utilization of Economic Trees at the Household Level**

Economic trees in the context of this study are limited to Dawadawa and Shea tree. Respondents were therefore asked if they or any member from their household engage in the utilization of economic trees. It was released that in one way or the other almost all respondents (96.2%) make use of these economic trees. It was only 7 respondents (3.8%) who stated that they or any member of their household do not make use of economic trees.

Respondents were further probed to indicate the kind of activities they or their family members engage in using dawadawa and shea tree. The results indicate that majority of the respondents were engaged in dawadawa processing, shea nut picking, processing and selling, Shea butter processing, firewood gathering and charcoal burning. According to some (23.2%) they engage in producing medicine using economic trees. Activities such as Shea butter soap making and logging of Shea trees were engaged in by same proportion of people (27%).

**Table 4. 8: Utilization of Economic Trees**

<b>Statement</b>	<b>Frequency</b>	<b>Percent</b>
Use economic trees	178	96.2
Dawadawa processing	167	90.3
Shea nut picking	167	90.3
Shea nut processing	108	58.4
Shea butter processing	159	85.9
Shea nut selling	167	90.3
Shea butter soap making	27	14.6
Shea product as medicine	43	23.2
Firewood gathering	145	78.4
Logging of Shea/Dawadawa trees	27	14.6
Shea tree charcoal burning	95	51.4

Source: Field Survey (2018)

The results Table 4.8 implies that household members engage in almost all the value chains in shea and dawadawa. The justification is that they are engaged in the picking of the



nuts/beans, drying, processing as well as sales of the products. Some are also engaged in the gathering and sales of the trees. This suggests that shea and dawadawa products are utilized by household members to support their living. The results agree with some empirical studies in different areas. For example, Farris *et al.* (2001) found that shea business provide livelihood alternatives to households in Uganda. The results are also consistent with Moore (2008) who report that the use of the shea tree covers aspects of livelihood, poverty reduction through the selling of its products and food security through the fruit pulp and oil from the nut.

#### **4.3.2 Actors in the Shea and Dawadawa Industries**

Various individuals and groups of people have been noted to engage in the utilization of economic trees and trees products. The results of the study confirmed that such people include children, women, men and sometimes all the household members. A 45 year old farmer shared his view with the researcher on the main actors of economic trees utilization in the Dorimon his community as follows:

*People who utilize shea or dawadawa trees are not hidden in this community. It is very clear to everybody women and children garther dawadawa and shea nuts for processing and consumption at home or for sale. Besides, charcoal producers like shea trees because they are very good in charcoal production, while chainsaw operators also cut down these trees for sale.*

This finding suggests that many of the indigenes in the Wa West District are aware of the main actors or expected to be aware that some groups of actors such as households' members, including women and children are actively engage in the gathering of dawadawa and she fruits. However, the utilization varies from one group to another. From Table 4.9,

the respondents have listed the categories of their household members who are actors in different aspects of the economic trees utilization.

**Table 4. 9: Actors in Shea and Dawadawa Industries**

<b>Actors</b>	<b>Frequency</b>	<b>Percent</b>
<b>People that pick shea/dawadawa</b>		
Women	177	95.6
Children	89	48.1
Men	14	7.5
<b>People that process Shea nut/Dawadawa</b>		
Women	113	61.1
Children	38	20.5
<b>People that process Shea butter/Dawadawa</b>		
Women	156	84.3
Children	14	7.6
<b>People that sell nut/Dawadawa</b>		
Men	48	25.9
Women	68	36.8
Children	47	25.4

Source: Field Survey (2018)

The results in Table 4.9 implies that women and are engaged in all the stages and processes involved in the utilization of shea and dawadawa. However, women involvement is more than that of children. The involvement of children suggests that utilization of economic trees is a household practice where children are involved as a form of socialization as well

as contribute to household labour supply. Men are also actors but only involved in some but not all activities if economic trees utilization. The activities that have been engaged in by men include the picking and selling of shea/dawadawa. Among all the categories groups of people utilizing the economic trees, women constitute the majority especially in picking and processing but there appeared to be mixed results on the sale of shea and dawadawa products. On the sales, men, women and children engage in them in almost equal proportion as shown in Table 4.9. The findings of this study are therefore, consistent with the work of Laube *et al.*, (2017), Banye (2015). These studies also identified women as main actors of the shea value chain. However, the findings of Carette *et al.*, (2009) that identified both local and international actors have not been reported in this study. This suggests that international buyers have no direct link with main actors of shea or dawadwa in the Wa West District.

It was also discovered that some actors of the Shea and Dawadawa trees utilization have also resorted to the direct use of these economic trees. These categories of actors include men, women, children, herbal doctors, and in some case all the members of the family. From Table 4.10, the main utilization of shea and Dawadawa trees include the preparation of soap with shea butter, the use of shea and dawadawa as fire wood, the use for medicine, the use of the two trees for cultural practices, and the use of the trees for shelter.

**Table 4. 10: Utilization of Shea and Dawadawa**

<b>Actors</b>	<b>Frequency</b>	<b>Percent</b>
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<b>People that make soap with shea</b>		
Women	128	69.2
Children	18	9.7
<b>People that gather firewood</b>		
Men	30	16.2
Women	119	64.3
Children	39	21.1
<b>People that use shea as medicine</b>		
All members of the family	16	8.6
Men	40	21.6
Women	65	35.1
<b>People that use shea/dawadawa for cultural activities</b>		
All members	8	4.3
Men	112	60.5
Women	81	43.8
Traditional Leaders	18	9.7
<b>Group that use Shea and dawadawa for shelter</b>		
All members	8	4.3
Household heads	8	4.3
Men	106	57.3
Women	41	22.2

Source: Field Survey (2018)

From Table 4.10, the relative frequencies vary from one use to another and from one actor to actor. However, the frequencies suggest the category of people who often resort to a particular utilization of the trees. For example, soap making is often associated with females hence women engagement in this practice is relatively more than other categories of actors. In terms of firewood gathering, women are found to have been playing more roles and hence acting more frequently than men and children. The results also suggest that men use shea and dawadawa trees in cultural events than the other categories of actors. One of these key cultural activities is shelter where men are often found to have been using the trees to provide shelter than women. In a similar dimension, empirical findings of Kavaarpuo (2010), Yussif (2015) and Carette *et al.* (2009) maintain that shea has been a source of diet

for many households especially those living in rural areas. This is consistent with the case of households in Wa West District as found by this study. The view that shea is a main source of diet for rural folk has also been supported by the empirical findings of Adams et al., (2016).

Another group of actors that utilize economic trees in the study area is chiefs. This was discovered through an interview with an Assembly Member on the actors of economic trees utilization. The respondents shared this with the researcher in an interview:

*Chiefs play a significant role in the utilization of economic trees in this locality. They do not involve themselves directly but sometimes are partly responsible through allowing or failing to punish people who engage in the destruction of the trees. Chainsaw operators sometimes offer tokens such as cola to the chiefs as way of obtaining permission to cut down some specific trees. However, they will go and cut down shea and dawadawa trees as well.*

The findings suggest that some actors will obtain permission to cut down some tree species but will fail to obey the conditions involved. This sometimes led to cutting down economic trees that are not allowed to be destroyed. The respondents therefore, felt that the chiefs have not been very strict in monitoring the activities of actors who destroy their economic trees and hence are themselves the actors of tree destruction.

#### **4.3.3 Actors that Destroy Economic Trees**

Other groups of actors in economic trees utilization that has been revealed in the study are farmers, Chain Saw Operators, Charcoal producers, Household members (for settlement) and carvers. All the respondents cited charcoal producers to be the main actors of economic

tree destruction in their locality. Equal proportion (89.2%) of interviewers stated that the activities of farmers such as land clearing and household settlement are the causes of destruction to economic trees within the study area. About 83.8% of the informant opined that chain saw operators are the responsible for economic trees destruction in the area. Similarly, 6.5% of the respondents maintain that carvers also destroy economic trees in their operations. The distribution is shown in Table 4.11.

**Table 4. 11: Actors that Destroy Economic Trees**

<b>Actors that Destroy Economic Trees</b>	<b>Frequency</b>	<b>Percent</b>
Farmers	165	89.2
Chain saw operators	155	83.8
Charcoal producers	185	100.0
Household Members	165	89.2
Carvers	12	6.5

Source: Field Survey (2018)

The results imply that different other people rely on the utilization of economic trees for their livelihoods. However, the actions of these people have a conflicting use with households' members who depend on them directly for food. The operations of chain saw users, carvers, charcoal producers, and farmers result in destruction of the economic trees and hence considered as unsustainable utilization of the trees.

A 38 year old woman from Dorimon lamented on the current trend of shea and dawadawa tree destruction by charcoal producers and chainsaw operators in a Focus Group Discussion as follows:

*Everybody in this community is aware that we depend on shea and dawadawa products for food especially during the off-farm season. However, the same women who gather the fruits also engage in charcoal production which involves destruction of the trees. Besides, people use chainsaw to cut down these trees and nothing is being done to stop them.*

This finding suggests that some community members are not happy with the way some actors utilize the economic trees. For example, the activity of charcoal production and chainsaw operators lead to serious destruction of the trees. This suggests that charcoal producers and chainsaw operators are the actors that engage in unsustainable utilization of the economic trees in the areas.

In the case of farmers, land clearing for crop production involves the destruction of shea and dawadawa trees. This finding however, presents a conflicting view since the same farm households rely on shea nuts for living as an alternative livelihood strategy. What perhaps they do is the destruction of young plants during land clearing and not the mature crops that have reach the age of maturity. In either case farming practices result in economic tree destruction in the Wa West District. Chain saw operators usually cut wood of different species and these include shea and dawadawa trees. It was found out that Shea trees in particular are very good raw materials for the construction of motor and pestle for domestic use. As a result, destruction of plant species through these activities remains a common practice in the area. Atalla (2015) and Osie (2015) consistently noted that charcoal production remain one of the activities leading to destruction of economic tree species in sub-Saharan Africa. The unsustainable exploitation of economic trees has been reported by MLNR (2016). The reports revealed that illegal logging by chainsaw operators, and

unauthorized miners are the main actors that destroy economic trees. However, evidence of the activities illegal miners has not been found in the Wa West District. This suggests that the actors in shea tree utilization or destruction are also determined by context and type of natural resources available in the area.

#### 4.3.4 Origin of Economic Trees Users

The results of the study indicate that people who destroy economic trees in the Wa West District are both natives and non-natives. New settlers or people from different areas outside the Wa West District participate in the destruction of shea and dawadawa trees. From Table 4.12, 87% of the respondents opined that not all the people who make use of economic trees are natives. Just a small number of respondents (13%) indicated that all economic tree users in that area are natives of the locality.

**Table 4. 12: Origin of People who Destroy Shea and Dawadawa Trees**

<b>All users are natives</b>	<b>Frequency</b>	<b>Percent</b>
Yes	24	13
No	161	87
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

The results suggests that majority of the respondents are aware of non-natives who take part in the destruction of economic trees. This means that the rate of destruction can be unsustainable if effective control mechanisms have not been put in place since those involve are not natives and may not be very much concerned about sustainable utilization of the resources.



Further findings revealed the category of people that destroy the economic trees. As shown in Table 4.13, the main actors in economic tree destruction include chain saw operators, carvers, charcoal producers, estate developers, Fulani headsmen, and new farm settlers.

**Table 4. 13: Category of Non-natives who Destroy Shea and Dawadawa Trees**

<b>Users who are not natives</b>	<b>Frequency</b>	<b>Percent</b>
Chain saw operators	110	59.5
Carvers	12	6.5
Charcoal and nut buyers	20	10.8
Estate developers	33	17.8
Fulani	22	11.9
Settled farmers	38	20.5

Source: Field Survey (2018)

From the table, majority (59.5%) of the respondents maintained that the activities of chain saw operators are causing more destruction to dawadawa and shea trees. Besides, 20.5% of the respondents also cited activities of new farm settlers in the areas that often engaged in mass destruction of these trees in order to establish new farms. Estate developers resulting from urbanization is one group agreed upon by 17.8% of the respondents as people who engage in economic trees destruction.

#### **4.3.5 Manner of Exploiting Economic Trees**

The researcher was interested in finding out whether people who destroy shea and dawadwa trees in the process of utilization seek permission. A question of permission to

exploit economic trees was put forward to the respondents and majority (55.7%) opined that it is not all persons who need permission in order to use these trees.

**Table 4. 14: The need to Obtain Permission before Cutting Economic Trees**

<b>Permission to Exploit</b>	<b>Frequency</b>	<b>Percent</b>
Permission Needed	82	44.3
No permission Needed	103	55.7
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey (2018)

From the results in Table 4.14, majority of the respondents shared the view that people who destroy economic trees in the process of utilization need not obtain any permission before cutting down the trees. This means that there is no effective control on the exploitation of natural resources such as economic trees in the Wa West District. Only some few respondents know that there is the need to regulate the use of economic resources such as trees in the area.

Attention was then turned to the category of people who need such permission. Using multiple responses as shown in Table 4.15, it was discovered that some 6.5% of the respondents think that all actors need to be granted permission before they make use of economic trees. Besides, 48.6% of the respondents maintain that only the chain saw operated need to be restricted and hence be given permission before undertaking their operations on economic trees. Other category of actors that must be restricted and required permission before cutting down shea and dawadawa trees include housing contractors

(estate developers), farmers, new settlers, landlords, charcoal producers, and other non-natives such as the Fulani herdsmen.

**Table 4. 15: Group of People who need Permission before Cutting down Economic Trees**

<b>Group of People</b>	<b>Frequency</b>	<b>Percent</b>
Chain saw operators	90	48.6
Farmers	27	14.6
Non-natives	27	14.6
All actors	12	6.5
Landlords	12	6.5
Contractors	11	5.9
Charcoal burners	11	5.9
Household settlement	8	4.3

Source: Field Survey, 2018

The results also implies that the various actors identified and presented in Table 4.15 are those who utilize economic trees in an unsustainable manner and hence require permits before undertaking their operations. However, no such effective permit is available in the Wa West District.

#### **4.4 The Influence of Economic Trees Utilization on Livelihood**

The findings of this study support the opinion that utilization of economic trees is mainly driven by the need to find livelihoods. This section therefore, presents the empirical findings on the drivers of exploitation of economic trees, the contribution of shea and

dawadawa to household livelihoods, and the specific factors that push people to exploit economic trees in the Wa West District.

#### 4.4.1 Derivers of Exploiting Economic Trees

Table 4.16 displays responses gathered from the household heads concerning the main derivers of exploiting economic trees such as the shea and dawadawa. All the respondents (100%) mentioned that the main derivers of exploiting economic trees are for income generation. Besides, nearly all of them (96.2%) indicated that it is as a result of food that they exploit the trees. According to some of the respondents (81.6%) the main derivers of economic trees utilization in their locality are cultural activities. With regard to medication, 80% of the respondents declared that economic trees are exploited for medicinal purposes.

**Table 4. 16: Key Drivers for the Exploitation of Economic Trees**

<b>Benefits</b>	<b>Frequency</b>	<b>Percent</b>
For food	178	96.2
For income	185	100.0
Medical purpose	148	80.0
Cultural activities	151	81.6

Source: Field Survey (2018)

The results in Table 4.15 imply that exploitation of economic trees such as dawadawa and shea trees in the Wa West District is driven by livelihood search, income generation, cultural and medicinal purposes. This suggests that utilization of dawadawa and shea trees has a significant impact on human life in the area. According to Hatskevich *et al.* (2011), economic trees such as shea for example, is the second most important oil crop in Africa after palm tree and hence play a major role in the livelihood of the people. This supports

the finding of this study that people utilize shea and dawadawa trees for food. Other empirical studies such as Seidu (2012) report that Shea butter is consumed locally in producing regions as food, cosmetics, soaps and detergents, and medicines.

#### **4.4.2 Contribution of Dawadawa and Shea to Food Requirement and Income Generation**

Information indicated early shows that the overwhelming majority declared that the main drivers of economic trees in the Wa West District are income generation and food. In terms of contribution to food, it was discovered as shown in Table 4.17 that all the respondents cited direct consumption of dawadawa and shea products as food, use of shea butter at home, and use of dawadawa in cooking.

**Table 4. 17: Utilization of Economic Trees for Food**

<b>Food requirement</b>	<b>Frequency</b>	<b>Percent</b>
Direct consumption	185	100
Use of Shea butter at home	185	100
Dawadawa in cooking	185	100

Source: Field Survey (2018)

The results suggest that both shea and dawadawa are being utilized directly as food at the household level. Shea and dawadawa are edible substances that are used household members. Besides, they can further be processed and use in cooking in the case of shea or used as leaves on the soup in the case of dawadawa. The fact that all the respondents agreed with these uses means that they are exclusively utilized as household diet in the Wa West District. Just as the report of past studies, the yellowish powder inside the dawadawa seed pods is sweet and can be eaten without preparation or also be made into drinks which are

good source of nutrients for humans (Gernah et al., 2007; Udo et al. 2016). This implies that dawadawa is very importance source of food to some household that utilize it.

Shea and Dawadawa are also utilized to earn income. It was discovered that the main sources of income through shea and dawadawa as shown in Table 4.18 include sale of dawadawa, sales of shea nuts, butter production for sale, exporting of shea, firewood gathering, and charcoal production using shea and dawadawa trees.

**Table 4. 18: Utilization of Economic Trees for Income Generation**

<b>Income Generation</b>	<b>Frequency</b>	<b>Percent</b>
Sale of dawadawa	185	100
Sale of Shea nuts	185	100
Butter production and sale	185	100
Exporting Shea	16	8.6
Firewood gathering	140	75.7
Charcoal production	109	58.9

Source: Field Survey, 2018

From Table 4.18, majority of the respondents have confirmed that the various income sources as shown in the table are driven from shea and dawadawa thus supporting then conclusion that the economic trees have a significant impact on household livelihoods. However, the use of shea and dawadawa for charcoal production which has been considered as a positive impact on livelihood can also threaten the sustainability of economic trees in the area. This suggests that the utilization of economic trees in the area provide livelihoods for households but can be detrimental to sustainable development of

the local economy of Wa West District. However, the report of Udo et al. (2016) that dawadwada has been used as animal feed has not been found in this study.

#### 4.4.3 Utilization of Shea and Dawadawa for Medicinal Purposes

Apart from the contribution of these economic trees to food and income generation, it is evident from the table that the people also depend largely on these trees for medical purposes. This table is a summary of multiple responses gathered from the respondents concerning the various ways they use the trees for medication. Though some could not specify exactly how they use the shea as for medical purposes, it was clear that they use the butter as ointment for treating, new babies, fractures and also as pomade and hair gel. Some also said they use butter and leaves to cure skin diseases. It was again mention that the leaves and roots are used in malaria treatment and also for abdominal pains. Similarly, it was stated that the back of the dawadawa trees is used same purpose as that of shea such as malaria treatment and also for abdominal pains. Quite surprisingly, it was revealed that the dawadawa is use to stabilize blood pressure, treat piles, scorpion bite and also add food nutrition which help avoid malnutrition among children.

**Table 4. 19: Use of Shea as Medicine**

<b>Shea for medicine</b>	<b>Frequency</b>	<b>Percent</b>
As medicine	12	6.5
Use butter and leaves to cure skin diseases	19	10.3
Leaves and roots for malaria treatment	12	6.5
The butter as ointment	43	23.2
Treat new born babies	30	16.2

Root to treat stomach pains	31	16.8
Use butter as pomade and hair gel	7	3.8
Use the butter for treating fractures	8	4.3

Source: Field Survey, 2018

One of the common medicinal use of shea as indicated by 23.2% of the respondents is the use of the butter as ointment, use of the root to treat stomach pains (16.8%), use of the butter to cure skin disease and many more as shown in Table 4.19. The findings imply that the roots, bark, leaves and butter of shea trees are used for medicinal purposes. Malaria is one of the very common diseases in developing countries and it has been found that shea butter and leaves can be used to cure malaria. This means that shea can be utilized in ways that will contribute to the achievement of the sustainable development goals since it is used to cure critical diseases such as malaria.

The study also revealed that dawadawa just as shea is used for medicinal purposes. Among them include: the bark being used as cure for malaria, used to cure abdominal pains, source of nutrition, stabilizes blood pressure, treat scorpion bite, and use to cure piles. The distribution of the uses of dawadawa is shown in Table 4.20.

**Table 4. 20: Use of Dawadawa as Medicine**

<b>Dawdawa for medicine</b>	<b>Frequency</b>	<b>Percent</b>
Back for cure of malaria	26	14.1
Back use to cure abdominal pains	26	14.1
Sources nutrition	39	21.1
Stabilize blood pressure	26	14.1



Treat scorpion bite	8	4.3
Use to cure piles	12	6.5

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Source: Field Survey, 2018

It can be deduced from Table 4.20 that dawadawa has several uses as a medicinal plant but many people are not aware of it just as the case of shea. This means that they are a lot of potentials in the Dawadawa plant that have not been discovered. Destruction of these trees by other users for livelihood will therefore, not lead to sustainable development of the Wa West District. This study provides related findings to other empirical studies of Udo et al. (2016), Odebiyi et al. (2004), Joshi and Joshi (2009). These studies report that dawadawa leaves, bark are used to treat leprosy and used for bronchitis, pneumonia, skin infections, sores, ulcers, and washes for fever, malaria, diarrhoea, and sterility and roots are used in a lotion for sore eyes (Udo et al. 2016). This means that the potentials of these trees are many to an extent that every empirical study always identifies a related new use of the tree.

#### **4.4.4 The use of Economic Trees for Social and Cultural Activities**

The study probed further to identify some of the ways dawadawa and shea trees contribute to the social and cultural activities of the people in the Wa West District. It was realized that they contribute immensely to the social and cultural activities of the people in the study area. Some of the social and cultural contribution of these trees includes; the use of especially the dawadawa for building purposes, some shea and dawadawa products use in outdoorings, funerals rites and traditional marriage. They are at times also use for the purification of the ancestors (food for smaller gods), and use for traditional medication. The distribution of the responses is shown in Table 4.21.

**Table 4. 21: Use of Shea and Dawadawa for Cultural Activities**

<b>Social and Cultural Activities</b>	<b>Frequency</b>	<b>Percent</b>
Traditional medicine	48	25.9
Funeral rites	27	14.6
Building purpose (mix with gravel to plaster and flooring)	8	4.3
Outdooring	18	9.7
Traditional marriage	11	5.9
Purification (food for smaller gods)	16	8.6

Source: Field Survey, 2018

The results of the study imply that both dawadawa and shea has a common cultural significance in the Wa West District. However, some of the cultural use of these trees are not generally known by majority of the respondents. For instance, the use of the trees for purification of goods, outdooring, traditional marriage, and for pasting buildings has been reported by smaller proportion of the respondents (lower than 10%). This suggests that the potentials of these economic trees are yet to be discovered and should be utilized in a sustainable manner. Seidu (2012) observation supports these findings that Shea butter is for cultural and religious purposes in northern Ghana. In a cultural dimension, Hatskevich et al. (2011) reveal that the residue from shea after extracting the butter is an excellent fuel and can be mixed with mud for plastering traditional mud houses, while wood from shea is used as stools, hoes, pestles and mortar. These findings are not different from the cultural uses of shea as reported in this study.

#### 4.4.5 Contribution of Shea and Dawadawa to Employment and Income

Sea and dawadawa trees have been found to have a significant impact on household livelihoods through business creation and income generation. In this study it was discovered that household members create employment through utilization of these trees and hence earn income from it. Table 4.22 shows descriptive statistics of the number of people employed in the shea and dawadawa sector and also the earning from the sector. The results indicate that One hundred and twelve respondents indicated that their household members are employed in the shea and dawadawa industry. From the data, the minimum number of members of households employed was 1 and the maximum number of people employed at the sector was 15. Averagely, from each household, 6 people are employed in the industry with a standard deviation of 0.905. In determining the income from the shea and dawadawa sector, 105 responded and out of this the minimum annual income was GH¢80 and the maximum income was GH¢3000. The average income earns GH¢1138.67 annually. This recorded a standard deviation of 878.641.

**Table 4. 22: Contribution of Shea and Dawadawa to Employment and Income**

<b>Employment and Income</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev.</b>
Members employed in the sector	112	1	15	6.21	3.905
Annual income from Shea/Dawadawa	105	80	3000	1138.67	878.641

Source: Field Survey, 2018

The results imply that shea and dawadawa serves as a significant potential for households' employment and income generation. However, the foregoing discussion suggests that household heads do not often engage in shea and dawadawa related business as their main occupation. Other household members rather engage in the utilization of these economic trees as an alternative income source to augment their main occupations. The average people employment in the household also means that almost half of the household members are employed in the sector since the average household in the area has been found to be 11. Besides, the earning from the utilization of economic trees appears to have been contributing significantly to household earning. The justification is the earning about GH¢ 1138.67 from dawadawa or shea business is represent a significant proportion of the annual household income from major occupations (GH¢ 3890.42). In a related study, shea is a business for women and a source of income for many families and to some extent contribute in some cases more than half of annual income of households in the Upper West region in particular (Carette *et al.*, 2009). Similar contributions of shea to household income have been reported by Ferris, et al. (2001) in Uganda. This means that the contribution of shea to household income has been consistently noted by several empirical studies.

#### **4.4.6 Drivers for the Engagement in Shea and Dawadawa Utilization**

The study discovered that some factors push or motivate households to engage in the utilization of dawadawa and shea trees in the Wa West District. These drivers have been identified and present in Table 4.23. The factors range from the view that shea and dawadawa are the available economic trees in the area to the issues of unemployment.

About 16.8% of the respondents opined that shea and dawadawa are the available economic trees in their area hence they people have no option than to go into their utilization. Besides, Shea and dawadawa business are sources of income which was confirmed by 15.1% of the household heads. Twenty eight (12.4%) respondents think it is a source of economic empowerment while 8.6% said people are pushed to join the shea/dawadawa industry as a result of poverty. On the side of employment, 3.8% believe that the lack of employment in the area influence them to engage in the utilization of shea/dawadawa tress as a business activity.

**Table 4. 23: Drivers for the Utilization of Shea and Dawadawa Trees**

<b>Reason for engaging in Shea business</b>	<b>Frequency</b>	<b>Percent</b>
Poverty	16	8.6
Source of economic empowerment	23	12.4
Source of income	28	15.1
The only available economic trees	31	16.8
Unemployment	7	3.8
<b>Total</b>	<b>185</b>	<b>100.0</b>

Source: Field Survey, 2018

The results of the study on drivers for economic tree utilization imply that both motivational and push factors influence household engagement in the utilization of economic trees. This imply that even the category of people who are destroying the trees through their livelihood drive means that they may be aware of the consequences of their actions but are compelled by poverty or their current circumstances to do so. Some of the respondents also maintained that economic trees must be utilized to support a living and

the fact that shea and dawadawa trees are very common in the Wa West District is responsible for their utilization.

#### **4.5 The Effect of Economic Trees Utilization on the Environment**

This section presents the results and discussion of the impact of economic trees utilization on the environment. First the negative consequences of shea and dawadawa trees utilization on the environment have been discussed. The next section presents the results and discussion of the environmental conservation through economic trees utilization.

##### **4.5.1 Negative effects of Shea and Dawadawa Trees Utilization on the Environment**

The respondents were asked to indicate the extent to which they agree or disagree with some statements regarding the negative impact that have been associated with the utilization of shea and dawadawa trees on the environment. The data were analysed using a 5 point likert scale (1=Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree) and presented using nd descriptive statistics (See Table 4.24). The descriptive statistics report the mean, mode and standard deviations of the responses.

**Table 4. 24: Respondents agreement with the effects of economic tree utilization on their environment**

<b>Environmental Effect</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Mode</b>
Shells are waste on environment	185	3.44	1.33	5
Shea processing dirty the environment	185	2.85	1.32	2
Wood gathering destroy trees	185	4.00	1.19	5
Farming destroy economic trees	185	4.05	1.00	5

Charcoal production destroy trees	185	4.76	0.51	5
Charcoal production lead to the loss of soil nutrients	185	4.24	0.86	5
Charcoal production enhance bush fire	185	4.61	0.84	5
Chain saw operators destroy trees	185	4.66	0.81	5

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Source: Field Survey, 2018

From Table 4.24, the respondents showed different level of agreement with the statement that the shells of the shea nut and dawadawa are waste on the environment. It was discovered that the descriptive statistics in Table 4.24 revealed a mean observation of 3.44, a standard deviation of 1.33 and a mode of 5. The mean value suggests that the respondents are almost neutral on the position that the shells of shea nut and dawadawa contributes to the stock of waste on their environment. The modal observation of 5 also suggests that greater proportion of the respondents strongly disagreed that the utilization of economic trees contributes to waste management challenges in their environment. There is therefore, evidence that at least there is waste generation associated with the utilization of shea and dawadawa trees by the actors in the Wa West District. In a related study in the Tamale metropolis of Ghana where most women were engaged in shea business, Jibreel et al. (2013) established that the adverse impacts of the processing of shea butter on the environment relates with the large volume of water used in the processing which changes the soil structure at disposal location, leads to inhabitation of plant growth. This means that despite the economic importance of some tree species such as shea and dawadawa, their utilization invariably have a detrimental effect on the environment.

Besides, regarding respondents' agreement with the statement "Shea processing dirties the environment", the descriptive statistics in Table 4.24 indicate a mean estimate of 2.85, a standard deviation of 1.32 and a mode of 2. This means that respondents have at least disagreed with the statement. Furthermore, when asked to indicate their agreement with the statement that firewood gathering leads to the destruction of shea and dawadawa tree, various responses were recorded. The descriptive statistics support these findings. From Table 4.24, the mean value is 4 with a standard deviation of 1.19 and a mode of 5. This suggests that majority of the respondents strongly agreed that firewood gathering from dawadawa and shea trees lead to destruction of trees.

Moreover, the respondents were asked to indicate their level of agreement with the statement that farming leads to cutting down of economic trees. The descriptive statistics in Table 4.24 support that the respondents have at least agreed with the statement given the mean as 4.05 and a mode of 5. The modal value means that the category of respondents who strongly agreed to the statement is relatively more than any other category of agreement.

Another issue was that charcoal production leads to the destruction of shea and dawadawa trees and majority. This proposition has been supported with by the descriptive statistics which report a mean value of 4.76, a standard deviation of 0.51 and a mode of 5. These descriptive statistics mean that the respondents have shown a strong agreement with the fact that charcoal production leads to destruction of economic trees and hence



environmental degradation. Similarly it was argued that charcoal production leads to loss of soil nutrients.

Finally, the respondents were required to indicate their level of agreement with the statement that chainsaw operators destruct economic trees and nearly all the respondents strongly agreed that their activities destroy economic trees such as shea and dawadawa. The results suggests that the activities leading to the utilization of economic trees such as shea and dawadawa also lead to loss of biodiversity. Shea and dawadwa trees are very important economic trees and support the livelihood of the people but are at risk of extinction due to unsustainable utilization.

#### **4.5.2 Environmental Conservation Measures adopted by communities**

The study also examined the importance of conserving the environment through the utilization of economic trees. A five point likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree) was used to measure respondents' agreements with some key variables regarding how utilization of shea and dawadawa trees leads to environmental conservation. The results were analysed and presented using descriptive statistics (see Table 4.25).

**Table 4. 25: Environmental Conservation through Economic Trees**

<b>Conservation of Economic Trees</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Mode</b>
Effective laws	185	2.67	1.45	4
Customs not allow	185	3.02	1.61	1
Tree planting exercise project	185	2.04	0.94	2

Economic trees on farms are preserved	185	3.45	1.25	4
Laws to prevent fire	185	2.91	1.32	2
Saw operators monitored	185	2.23	1.42	1
Banned charcoal production using Shea and Dawadawa	185	2.74	1.60	1
Community committee for monitoring	185	1.94	0.98	1

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Source: Field Survey, (2018)

First, the respondents were asked to indicate their level of agreement with the statement that there are effective by-laws on the cutting of shea and dawadawa tree in the community. The descriptive statistics revealed a mean of 2.67, a standard deviation of 1.45 and a mode of 4. This means that most of the respondents have agreed that there are bye-laws to guide the utilization of economic trees. The mean value of the respondents (3.02) suggests that most of the respondents were neutral on the proposition.

Tree planting exercise is often adopted by communities as an environmental conservation method. The respondents in this study were therefore, asked to indicate their level of agreement with the statement that there are tree planting projects going on in their respective communities as a way of environmental conservation. The descriptive statistics in Table 4.25 revealed a mean value of 2.04 and this correspond with disagreement with the statement. This means that communities in the Wa West District have not taken afforestation projects serious despite the widely deforestation practices resulting from the utilization of economic trees.

Furthermore, the research wanted to know whether economic trees on farmlands have been preserved and the respondents were asked to indicate their level of agreement with the statement. The results revealed a mean of 3.45 and a modal observation of 4. This means that the respondents have at least agreed that dawadawa and shea trees are preserved on farmlands. This opinion contradicts the view that farmers destroy shea and dawadawa trees during land clearing. Another issue was the activities of chainsaw operators, which it was indicated that they are monitored on the use of economic trees. The descriptive statistics revealed a mean value of 2.23 and this suggests that the respondents have at least disagreed with the fact that chainsaw operators are monitored. The absence of any supervision on the activities of chainsaw operators could lead to mass destruction of economic trees in the areas. This could even become worse since there were no effective bye-laws governing the utilization of economic trees.

It was also put forward that charcoal producers should be banned from using shea and dawadawa. The results in Table 4.25 support that banning of charcoal production as well as existing of community Committee for monitoring the utilization of shea and dawadawa trees has been disagreed upon by the respondents. This suggests that there have not been effective environmental conservation measures in the Wa West District.

While there is general consensus that enough conservation techniques has been put in place to protect dawadawa and shea trees species, the result from a Focus Group Discussion reveled a different opinion on how economic trees have been utilized in a sustainable way. A 54 year old elder made a comment as follows:

*Destruction of shea and dawadawa trees has been noted to be done by chainsaw operators, Fulani headsmen through bush burning, and charcoal producers. However, the charcoal producers have been advised and agreed upon not to use live trees in charcoal burning but rather resort to trees that have died. Besides, farmers are not allowed to cut down shea or dawadwa trees during land clearing.*

The result suggests that there are informal attempts to conserve economic trees in the Wa West District through indigenous mechanisms. However, these methods may not be effective without appropriate sanctions to punish those who fail to comply.

Similarly, an interview with a respondent from the Wa West District Assembly shared this with the researcher regarding the strategies of economic trees conservation:

*There is an establishment of Community Resource Management Area (CREMA) in the Wa West District to protect the natural resources in the Area. This is a defined area where cutting down of trees species or bush burning is prohibited.*

The result implies that efforts have been taken to protect the natural resources in the Wa West District. The establishment of CREMA is one of the effective strategies the Forestry Service Division is using to conserve tree species in particular and also fight against deforestation.

Studies in some African countries also report that environment conservation through the utilization of economic trees has not been effective. For example Atalla (2015) review of

institutional framework for conservation of the shea tree in Uganda noted ineffective national policies and clear implementation strategies to guide regional and national intervention to conserve the shea tree. Besides, Okine (2017) as well as Carette *et al.* (2009) all conclude from their investigations that there have not been enough policy support for the conservation of economic trees such as shea in Ghana.



## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION**

#### **5.1 Introduction**

This chapter presents the summary of findings of the study, the conclusions and recommendation. First, the next section presents summary of the major findings in line with the objectives of the study. The conclusions are the various implications of the findings and finally the policy recommendations are also presented under a separate section.

#### **5.2 Summary of findings**

The study was conducted on the utilization of shea and dawadawa trees in Wa West District with much focus on the analysis of actors, drivers and impact. A thorough literature was reviewed on key variables covering the dawadawa and shea industry, the actors (participants), and the impacts on livelihood and environment. The sustainable livelihood framework was adopted as the guiding conceptual framework of the study. A survey was therefore; conducted to gather primary data from households, key community members and stakeholders of environmental conservations in the Wa West District. Quantitative data were coded and entered into the SPSS spread sheet and the analysis was done using descriptive statistics. All form of qualitative data that were collected through interviews and Focused Group Discussion and were analysed using content analysis. Several results were obtained and summarized as follows:

### **5.2.1 Actors in Economic Trees Utilization**

Some people have been identified to have engaged in the utilization of dawadawa and shea trees in the Wa West District. Some of the activities they engaged in include; dawadawa processing, shea nut picking, processing and selling, Shea butter processes and soap making, medication, firewood gathering, tree logging and charcoal burning/production. The study therefore, identifies the key actors as women, men, and children. Besides, some groups of people that play key roles in the utilization of these trees include shea nut processors, dawadawa processors, chainsaw operators, charcoal producers, farmers, estate developers, carvers, and Fulani herdsmen.

These actors play different roles in the utilization of the trees. For example, it was discovered that some of the actors are engaged sustainable utilization of the trees and they include women and children who pick shea nuts or harvest dawadawa, shea nut processors, and herbalists that use the leaves, backs, and roots of these trees. Their utilization does not cause destruction to the tree species in the area. However, the activities of other groups of actors do not bring sustainability to the trees. They include chainsaw operators, farmers; during their land clearing, estate developers, charcoal producers, and Fulani herdsmen. These people cut down the tree species and that lead to their extinction. The study also pointed out that chiefs have significant power to stop or allow the cutting down of the trees and hence are indirect actors in the utilization of economic trees in the Wa West District.

### **5.2.2 Influence of Utilization on Livelihoods**

The results of the study covered impacts of economic trees utilization on livelihoods. It was first identified that many of the actors are driven into shea and dawadawa trees utilization because of the desire to earn livelihoods. Similar, other key drivers identified include poverty, employment, medicinal, and socio-cultural necessities. People utilize shea and dawadawa trees to earn income that contributes significantly to the annual household earning. Besides, other are employed directly in activities such as charcoal production, shea processing. Others trade in the products of these economic trees.

Specifically, the utilization of shea and dawadawa trees lead to employment creation where an average of 6 household members and produce an average annual income of GH¢1138.67. Shea and dawadawa trees are noted to have alternative livelihood options where people can rely on their products for food. Shea butter for example is used for cooking to replace other manufactured products. Shea and dawadawa were discovered to have medicinal value that can treat common but serious diseases in the locality. Cure for malaria, abdominal pains, source of nutrition, stabilizes blood pressure, treat scorpion bite, and use to cure piles are the functions of shea and dawadawa trees in the Wa West District.

### **5.2.3 Influence on the environment**

The utilization of shea and dawadawa trees has impact on the environment. The negative impacts are that Shells are waste on environment, Shea processing dirty the environment, Wood gathering destruct trees, Farming destroy economic trees, Charcoal production



destroy trees, Charcoal production lead to the loss of soil nutrients, Charcoal production enhance bush fire. These negative impacts affect their soil quality, affects farming activities (crop yields), and enhances bush fires. This threatens the lives of those whose livelihoods are entirely dependent on the environment.

Besides, there has not been adequate preparedness to combat the negative effects that are associated with the utilization of shea and dawadawa trees in the Wa West District. Despite the attempts made to enact bye-laws, plant trees, and preserve economic trees on farmlands, control mechanism to enforce compliance have been weak. The activities of chainsaw operators, charcoal producers, estate developers, and Fulani herdsmen still prevail in an uncontrolled manner leading to deforestation, and environmental degradation. These activities do not support sustainable development objectives in the Wa West District.

### **5.3 Conclusion**

The results of the study are in line with the sustainable livelihood framework development by the Department for International Development (DFID, 1999) and adapted for this study. It has been confirmed that rural households depend on the natural assets of their immediate environment. Examples include the collection (of firewood), cultivation of food crops, and exploitation of timber from dawadawa and shea trees. DFID (1999) suggests two main livelihood effects which include environmental sustainability, and livelihood security these have been supported by the findings of this study. The study points there were conflicting goals in the utilisation of economic trees by different users. The results also imply that local administration and state agencies were there to support but their efforts have been

futile. This means that the natural capital which comprises of economic trees species are threatened and could soon be depleted.

The results also imply that the Wa West District is blessed with natural resources such as shea and dawadawa. Besides, this potential have been identified by both households and development institutions. The use of shea and dawadawa trees has a positive impact on livelihoods, income and the health of the people. However, the current methods of utilization by key actors have not been sustainable and future development potentials from utilization of these trees will soon be lost. The weakness associated with local and state institutions has translated into the mode of operations of key actors in the utilization of economic trees.

#### **5.4 Recommendation**

The results of the study suggest some policy recommendations for actors and development partners in the utilization of shea and dawadawa trees in the Wa West District.

The study revealed that different categories of actors are engaged in the utilization of shea and adawadawa trees. However, their mode of operations results in conflicting development objectives. While farmers and shea processors are advocating for the preservation of these economic trees, such trees are also good raw materials for charcoal production, and other uses. Effective stakeholder facilitation is therefore, required at this point. This study recommends that the chiefs, District Assembly, and the Forestry Service Division should collaborate in this facilitation. One key strategy to adopt and implement is the formation of local associations among the different actors with their own bye-laws

regarding the sustainable utilization of economic trees. This will enable them to coordinate their own activities and make reports to the facilitators.

The results further indicate that the utilization of economic trees has a positive impact on employment, income and livelihood sustainability. This means that the Wa West District has great potentials for development. It is therefore, recommended that the District Assembly can develop the shea and dawadawa industry for further employment. The government is also advised that its policy on rural industrialization will meet effective stakeholder support in the Wa West District is the shea industry would an area of priority. The value chain of shea and dawadawa will be enlarged to include people outside the area. Development of the industry will also come along with its tree preservation strategies.

Besides, the Ministry of Health (Ghana) in its effort to promote traditional medicine should recognize the important role of shea and dawadawa trees. It is therefore, recommended that health sensitization programmes should include ways of sustainable utilization of medicinal trees/plants. This will also contribute towards achieving sustainable utilization of economic trees.

The role of government institutions in reducing the negatives effects of shea and economic trees utilization has not been effective. For example the activity of chainsaw operators is illegal but which is very common in the Wa West District despite the existence of the Forestry Service Division. This study therefore, recommends that resources meant to enforce environmental conservation should be entrusted in the hands of the local people.

Once they are the affected people, more capacity building training should be given to them to be able to develop action plans regarding the sustainable use of their immediate natural resources.



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## APPENDICES

### **Appendix 1: Descriptive Statistics of Respondents Age**

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Age	185	22	73	41.46	14.747

Source: Field Survey (2018)

### **Appendix 2: Questionnaire for Household Heads**

**UNIVERSITY OF EDUCATION, WINNEBA  
COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

**Questionnaire for Households**

#### **Introduction**

This questionnaire is seeking your opinion in an effort to solicit information to write a thesis on the topic “**Utilization of Shea and Dawadawa Trees in Wa West District: Actors, Derivers and Impact**”. This study is being conducted in partial fulfillment of the award of an academic degree. Your opinion is therefore needed for academic purpose only and will be treated confidentially.

#### **A. Background Information of Respondents**

1. Gender: a. Male [  ] b. Female [  ]
2. Age of respondent.....
3. Ethnicity: a. Waala [  ] b. Dagaaba (Dagao) [  ] c. Brifo [  ] d. Lobi [  ] e. Others (specify).....
4. Marital status: a Married [  ] b. Single/Never married [  ] c. Widow [  ] d. Separated [  ]

5. Household size.....
6. Religion: a. Christianity [ ] b. Islam [ ] c. Traditional religion [ ]
7. Level of formal education: a Basic [ ] b. SHS [ ] c. Tertiary [ ] d. No formal education [ ]
8. Occupation: a. Farming [ ] b. Teaching [ ] c. Trading [ ] d. Charcoal Burning [ ] e. Others (specify).....
9. How much do you earn from your major occupation in a year?.....
10. Do you have a minor occupation? a. Yes [ ] b. No [ ]
11. How much do you earn from your minor occupation in a year?.....

**B. Actors in the utilization of economic trees**

1. Do you or any of your household members engage in the utilization of economic trees? A. Yes [ ] b. No [ ]
2. Which of the following activities do any of your household members engage in? (please select all that apply)
  - a. Dawadawa processing
  - b. Shea nut picking [ ]
  - c. Shea nut processing [ ]
  - d. Shea butter processing [ ]

- e. Shea nut selling [ ]
- f. Soap making using shea butter [ ]
- g. Use of shea products as medicine [ ]
- h. Shea trees firewood gathering [ ]
- i. Logging of shea trees [ ]
- j. Charcoal burning using shea trees [ ]

3. Who in the household engaged in any of the activities in question 2? (select all that apply)

- a. Household head [ ]
- b. Women [ ]
- c. Children [ ]
- d. Every household member [ ]

4. Apart from your household members, please provide in the table below the group of people against the specific utilization of economic trees.

Activity (Uses of economic trees)	Group of people engage in it
Shea nut picking	
Shea nut processing	
Shea butter processing	
Shea nut selling	
Soap making using shea butter	
Shea trees firewood gathering [ ]	
Use of shea products as medicine	
Use of shea products as cultural activities	
Use of shea trees for shelter	

5. Which of the following categories of people destroy economic trees such as shea and dawadawa in your locality? (Select all that apply).

- a. Farmers during land clearing

- b. Chain saw operators
  - c. Charcoal producers
  - d. Households for settlements [ ]
6. Are the people who use shea trees in your locality all natives? a. Yes [ ] b. No [ ]
7. Please list the actors in economic trees utilization that are not natives in your locality?

.....

.....

.....

.....

8. Do all actors need permission before exploiting shea trees in your locality? a. Yes [ ] b. No [ ]
9. Which category of people need to obtain permission before they can exploit the shea trees?

.....

.....

.....

**C. The Influence of Utilization of Economic Trees on Livelihoods**

10. What are the main drivers for the exploitation of economic trees such as shea and dawadawa in your locality? (Select all that apply).
- a. For food (directly) [ ]
  - b. For income [ ]

- c. Medicinal purposes [ ]
- d. Cultural/Social activities [ ]

11. In what way does shea or dawadawa contribute to your household food requirements? (Select all that apply)

- a. Direct consumption of the fruits [ ]
- b. We use shea butter in the house [ ]
- c. We use dawadawa in cooking [ ]
- d. Others specify [ ]

12. In what ways does your household consider economic trees as a source of income generation? (Select all that apply)

- a. Sale of Dawadawa [ ]
- b. Sales of shea nuts [ ]
- c. Shea butter production and sale [ ]
- d. Exporting of shea [ ]
- e. Fire wood gathering [ ]
- f. Charcoal production

13. How does your household depend on shea for medicinal purpose?

.....  
.....  
.....

14. How is dawadawa being used as medicine in your locality?

.....

.....  
.....

15. What social or cultural activities do you use shea or dawadawa for?

.....  
.....  
.....

16. How many people in your household are employed in shea or dawadawa business?

.....  
.....

17. How much do you earn in a year in your shea business?

.....

18. What is the main factor leading to your engagement in shea or dawadawa business?

.....  
.....  
.....

**D. The Effect of Economic Trees Utilization on the Environment**

19. Please indicate your level of agreement with the following statements as they relate with the effect of economic trees utilization on the environment? Using a 5-point likert scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree)



<b>Effect</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The shells of shea nut are waste on the environment					
Processing of shea butter makes the environment dirty					
Firewood gathering leads to destruction of shea and dawadawa trees					
Farming leads to the cutting down of shea trees (deforestation)					
Charcoal production leads to destruction of shea and dawadawa trees					
Charcoal production leads to loss of soil nutrients					
Charcoal productions enhances bush fires that destroys plant and animal species					
Chainsaw operators destroys economic trees					

20. Please indicate your level of agreement with the following statements as they relate to environmental conservation through the utilization of economic trees? Using a 5-point likert scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree)

<b>Activity</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
There are effective by-laws on the cutting of economic trees in our community					
The customs of our community do not allow the cutting of shea trees					
We have tree planting exercise projects in our community					
Economic trees on farm lands are preserved					
There are bye-laws to prevent burning of bush					

Chainsaw operators are monitored on the use of economic trees					
Charcoal producers are banned from using shea and dawadwa trees					
There is a committee in the community to monitor unsustainable exploitation of economic trees					



## Appendix 4: Focused Group Guide

### UNIVERSITY OF EDUCATION, WINNEBA COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

#### **Focus group Guide (Traditional leaders, Charcoal producers, Farmer groups, Chainsaw Operators)**

##### **Introduction**

This focus group discussion is seeking your opinion in an effort to solicit information to write a thesis on the topic “**Utilization of Shea and Dawadawa Trees in Wa West District: Actors, Derivers and Impact**”. This study is being conducted in partial fulfillment of the award of an academic degree. Your opinion is therefore needed for academic purpose only and will be treated confidentially.

##### **A. Background information of respondents**

1. Record number of participants, ages, gender, education, and category of respondent

##### **B. Actors in the utilization of economic trees**

2. Which groups of people are often engaged in economic trees utilization in this locality? (**probe for** the categories such as farmers, chainsaw operators, shea butter processors, charcoal producers, among others).
3. To what extent do they utilize the economic trees? (**probe for** destructions, preservation, seasonality).
4. How are the actors in economic trees utilization related? (**Probe for** vertical integration, horizontal integration, value chain linkages)

##### **C. The Influence of Utilization of Economic Trees on Livelihoods**

5. To what extent do households rely on economic trees utilization as livelihood strategies? (**Probe for** trees as main livelihood option, supporting livelihood strategy, income levels)
6. How exploitation of economic trees does affect the livelihoods of others? (**Probe for** competing uses of economic trees, effects of economic trees utilization on some livelihood activities).

**D. The Effect of Economic Trees Utilization on the Environment**

7. What are the effects of economic trees utilization on the environmental? (**probe for** possibilities of deforestation, bio-diversity loss, loss of soil quality, droughts)
8. How has the environmental effect of economic trees utilization being supported? (probe for actions to minimize the environmental effects, the use of bye-laws, the role of the traditional authority, the role of the district assembly, the role of community youth)

**Appendix 5: Interview Schedule for Key Respondents**

**UNIVERSITY OF EDUCATION, WINNEBA  
COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

**Interview schedule for the District Assembly and Forest Service Division**

**Introduction**

This interview is seeking your opinion in an effort to solicit information to write a thesis on the topic “**Utilization of Shea and Dawadawa Trees in Wa West District: Actors, Derivers and Impact**”. This study is being conducted in partial fulfillment of the award of an academic degree. Your opinion is therefore needed for academic purpose only and will be treated confidentially.

**A. Background information of respondents**

1. Name of respondent’s institution.....
2. Position of respondents in the institution.....
3. Years of working experience your institution.....

**B. Actors of economic trees (shea and Dawadawa) utilization**

4. Who are the main actors in the utilization of economic trees in the Wa West District?
5. Please list the group of actors and indicate whether their activities are permitted by law in the Wa West District?
6. What relationships exist among the actors in the utilization of economic trees?

**C. The Influence of Utilization of Economic Trees on Livelihoods**

7. How has the utilization of economic trees being a livelihood strategy in the Wa West District?
8. What kinds of livelihood strategies are associated with the utilization of economic trees in the Wa West District?

**D. The Effect of Economic Trees Utilization on the Environment**

9. What are the effects of economic trees utilization on the environmental? (**probe for** possibilities of deforestation, bio-diversity loss, loss of soil quality, droughts)
10. How has the environmental effect of economic trees utilization being supported? (probe for actions to minimize the environmental effects, the use of bye-laws, the role of the government institutions, the role of the district assembly, the role of community youth)