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Effects of Engagement in Shea Butter Processing on Sustainable Livelihood of Women in Sagnarigu Municipality

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Abstract:

The study sought to assess effects of engagement in shea butter processing on sustainable livelihood of women in Sagnarigu Municipality. The study deployed a mixed research approach where data was collected using both structured questionnaire and interview guide. Independent-Samples t-test was used to analyse the questionnaire data from 240 women engaged in shea butter processing. Also, narrative method was used to analyse interview data from 5 women. It was found that engagement of women in shea butter processing has significantly improved their financial, natural, social and physical capitals. The study recommends for integrated shea butter processing policy in Ghana, where value is added at each supply chain of shea butter processing to help improve livelihood of many women in the Sagnarigu Municipality.

Keywords: *Women, Shea butter processing, sustainable livelihood, Sagnarigu Municipality.*

Introduction

Shea butter is a common commodity which is known among indigenes of Sub Sahara Africa for its nutritional and medicinal prowess. Shea butter has its source from the shea tree which is an important component of agro forestry parklands in the dry Savannah region of Sub-Saharan Africa. It stretches from Senegal in West Africa to Sudan in the East and the foothills of the Ethiopian highlands. The stretch is acknowledged as the Shea belt of Africa and it occupies an area of about 1 million square kilometer (Chalfin, 2004). In Ghana, the shea tree is predominately located in the Upper East, Upper West, Northern, Savannah, and North East Regions with concentrations in Eastern Dagomba, Southern Mamprusi, Western Gonja, Lawra, Tumu, Wa, and Nanumba. Eastern Gonja is considered to have the densest stands (Chalfin, 2004).

The Shea tree provides many economic activities for people living in the communities where Shea trees are found. The shea tree provides jobs for Shea pickers, traders who buy directly from the pickers, Shea kernel and Shea butter processors and exporters (Collins, 2014). Like most agro-processing industries in Ghana, the Shea industry in the Northern region is characterized

by activities of rural women and it is the major income-generating activity for women (Dauda, Mariwah & Abane, 2013). The venture is considered generational since it is passed down from parents to their children (Palmieri, 2012). Shea butter extraction process is categorized into three main methods; traditional, semi mechanized and fully mechanized industrial systems (Alhassan, 2012). The traditional method involves the following activities: harvest the nuts from the farm, accumulate in piles or pits, heat the nuts , boil (preferred) or roast, dry the whole nuts (if boiled), de-husk the nuts to get kernels, mill and kneaded (water-boiled or pressed) to form an emulsion to separate fats, boil the oil (fat) to dry and clean by decanting to clarify the butter, prepare for use, sale , or storage (cooled oil will congeal into solid white or cream colored (Geri, 2010). The semi-mechanized method involves the use of grinders to take the place of pestle and mortars and these hands operated machinery reduces the amounts of firewood and water required. Fully-mechanized Shea butter processing method involves the use of fermentation/ parboiling tank, parboiled Shea fruit digester, bed drier, cracker/shell separator, roaster, milling machine, oven, basket oil presser, warehouses and or chemical solvents to extract the oil (Ferris et al, 2001).

However, in Ghana, women in the rural areas are much fond of the traditional method of extraction, which uses manual labour (Dauda, Mariwah & Abane, 2013). The traditional method of shea butter processing has major production challenges that impact the income earned by the women engaged in shea butter processing, hence, influencing their livelihood (Carney & Elias, 2006).

Shea butter processing is expected to enhance the sustainable livelihood of women in rural Ghana. The sustainable livelihood framework was first introduced by the Brundtland Commission on Environment and Development in 1992. The United Nations Conference on Environment and Development expanded the concept, advocating for the attainment of sustainable livelihood as a broad goal for poverty eradication. Chambers and Conway (1992) proposed the following composite definition of a sustainable rural livelihood, applied most commonly at the household level:

> *"A livelihood comprises the capabilities, assets (stores, resources, claims, and access), and activities required for a means of living: a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunity for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term."*

There are three insights into poverty that underpin the approach of Chambers and Conway (1992). From this definition, three perspectives can be derived to further understand the implications of livelihood. First, an expansion of the economy is much significant for poverty reduction. This can be attributed to the fact that people usually take advantage of good economic policies and opportunities to grow their income levels and minimise the tendency of being poverty stricken. Secondly, there is the realization that poverty is not just a question of low income, but also includes other dimensions such as poor healthcare, illiteracy, lack of social services as well as a state of vulnerability and feelings of powerlessness in general. Finally, the poor must be actively engaged in decisions and policies that concern their lives so as to improve their livelihood. This study focused on the second dimension of the three insights.

Some women, in Sagnarigu especially, collect shea nuts for sale and others process them into butter, soap and cream for sale (Issahaku et al. 2011). However, poverty level in the Sagnarigu Municipality is still high, significantly exceeding the national average (7th Ghana Living Standard Survey). Thus, this undermines the sustainable livelihood of women engaged in shea butter processing. Issahaku et al. (2011) attributed the slow growth of shea butter industry to the use of traditional methods by the women who are engaged in the activity. Kent and Bakaweri (2010) identified poor access to market by women engaged in shea butter as a challenge to

growth of the business and their sustainable livelihood. In view of this, national and international actors over the years have attempted to support shea butter production and marketing through financial and technical support schemes (Ayeh, 2009). Under the "Sekafshea" butter processing loan scheme in Ghana, about 2000 women received financial support, skill training, and appropriate processing equipment. Additionally, these women groups equally receive support from both national and international NGOs. Despite all these interventions, the sustainability of these women groups engaged in shea butter processing is still a challenge in Ghana. Large quantities of shea nut remain unprocessed annually or few processed butters are sold at the least market prices; hence, incomes of these women are still low, especially in the Northern Region of Ghana (Kumase et al., 2010). Empirically, some studies have shown the engagement in shea butter processing and other agro-processing in rural communities have not improved livelihood sustainably. For example, Issahaku, Al-Hassan and Sarpong (2010) noted that around 86 percent of the population are engaged in Shea butter processing as a means of livelihood in the Upper West Region. However, the incomes of about 60 per cent of those participating in this economic activity is below the 2023 minimum wage (14.88 cedis a day), with women being the majority of the poor (Adams et al., 2016).

The above concerns raises questions about the extent to which women's engagement in shea butter processing has affected their livelihood sustainably in Sagnarigu Municipality. However, all existing studies, as some indicated above did not addressed this question, using a sustainable livelihood framework. This study, therefore, used sustainable livelihood framework to investigate the effect of engagement in Shea butter processing on the sustainable livelihood of women in the Sagnarigu Municipality of the Northern Region of Ghana.

Literature Review

Sustainable Livelihood

Livelihood comprises of capabilities, assets (including both material and social resources), and activities required for a means of living. Accordingly, livelihood can also be viewed as a means of support or subsistence; adequate stocks and flows of food and cash to meet basic needs (Chambers & Conway, 1992). Livelihood is sustainable when a person can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

Sustainable livelihood has its sources from human capital (education, skills, and knowledge), natural capital (access to land, water, and shea nut), social capital (norms, ownership to the property, group membership, network, and claims), physical capital (accommodation, means of transport, equipment for production, agricultural investment, and possession of other businesses) and financial capital (savings, access to credit, insurance and income from other businesses). Chambers and Conway (2000) view livelihood as capabilities, assets (including both material and social resources), and activities required for a means of living. This means that women into shea butter processors could obtain their livelihoods through their effort, assets, and social relations such as group membership. Ellis and Freeman (2009) on their part define the concept of livelihood to encompass the wider context of governance, institutions, and enabling environment for poverty alleviation.

Also, livelihood of individuals or households are said to be sustainable when they are resilient in the face of external shocks and stresses; are not dependent upon external support (or if they are, this support itself should be economically and institutionally sustainable); maintain the long-term productivity of resources; and do not undermine the livelihoods of, or compromise the livelihood options open to others (Khatiwada et al, 2017). Sustainable livelihood can be seen in many different ways according to Farrington (2001). It can be defined as a set of principles guiding development interventions

(whether community-led or otherwise). According to Morse et al (2009), the basic issue is the rationale that an intervention has to be evidence-based rather than instigated in top-down fashion without sufficient knowledge of the community. It can also be seen as an analytical framework to help understand what 'is' and what can be done (Farrington, 2001).

Each of the capitals has its own features and characteristics which make them volatile (Morse et al, 2009). Some of the assets may change little over time (e.g., land and buildings) while others such as cash and social networks can be volatile and depend upon movement of people into and out of the household. Vulnerability to shocks can also vary. A drought for example will impact upon natural capital and in turn reduce crop yields, but may have little if any effect on other capitals. In the longer term, of course, a severe drought could impact on a wide range of capitals, including social and human as people emigrate. Similarly, flooding may damage physical and natural capital while having little impact on the others. Thus, the capitals vary in terms of their resilience to different types of shock and the intensity of that shock (Morse et al, 2009).

Sustainable livelihood as an approach is people-centered in a direct sense, and depends upon the involvement of those meant to be helped by change. Indeed, this is both a principled and practical stance as it is hard to imagine being able to carry out sustainable livelihood without the involvement of people that are meant to be helped by change (Morse et al, 2009). Thus, sustainable livelihood forces an engagement with those meant to be helped by an intervention or policy. It cannot be done from an office. In line with participatory approaches in general, this provides opportunities for community-based learning where people can learn from each other as well as from outsiders (Butler and Mazur, 2007). The Figure 1 shows the components of sustainable livelihood.

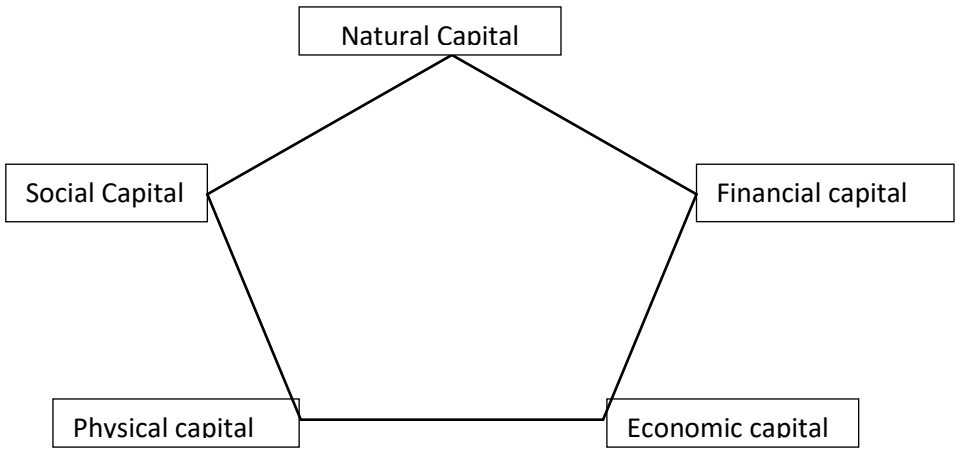

Figure 1. The Five Capitals of Sustainable Livelihood
Source: Scoones, 1998

Thus, sustainable livelihood comprises of access to social, financial, physical, natural, human and institutional capital to meet both the current and future needs. This study therefore turns to review each of the components of sustainable livelihood as follow.

Natural (Environmental) Capital

Natural capital is part of the environment that humans actually utilize for livelihood (Venturini et al., n.d.). Shea trees are wild trees that naturally grow in producing areas. The yield of shea nut is dependent on factors not controlled by man like the weather condition (Ferris et al., 2001; Carrette et al., 2009). The agricultural land and

land for processing centre play key role in sustainable livelihood (Sati et al, 2014). For example, land for processing centre help in activities of the shea butter processing. Therefore, women who have access to land can engage in shea butter processing business. Engagement in shea butter processing is expected to increase women's access to natural capital to ensure sustainable livelihood (Ellis & Freeman, 2002). Ellis and Freeman (2002) explained that shea butter processing helps women to earn income, which makes them able to acquire land by themselves for agriculture and building purposes.

Physical Capital

Physical capital refers to things created by human beings: highways, communications networks and other types of assets, as well as warehouses, building and machinery to help in production of goods and services (Venturini et al., n.d.). In shea butter processing, physical capital needed include but not limited to pot, basin, and other tools and equipment and storage facilities (Ellis & Freeman, 2002). The factory may be more than just productive capital, it may have aesthetic or historical or community-related meanings, but in this context, factory is really nothing other than a capital for production (Emmakd, 2020). Aside the physical capital used in shea butter processing, physical capital also comprises of durable items or properties owned by the women for livelihood. The more the women possess these durable items, the more sustainable their livelihood is (Scoones, 1998). Examples of such physical capital include televisions, radio, cars, motor bicycle and bicycle (Scoones, 1998).

Human Capital

Human capital is a stock of skills that can yield a flow of services. Not only are these skills reflective on your experience, education, training, and capability; they also include beneficial behavioral patterns as well as your energy level and your physical and mental health. There are some components of inherited characteristics of all these aspects of human capital, but they must also be produced and improved by nurturing, schooling and other aspects of life experience (Venturini et al., n.d.). Human capital has been identified as one of the key constraints to improved shea butter processing. Al-hassan (2012) undertakes a study on the market access capacity of shea nut processors in Ghana. His empirical results show that actors' limitation in accessing the market is associated with poor entrepreneurial skills, over-dependence on Traditional methods, and lack of formal training.

Financial Capital

Money can be considered as a stock of capital if it is invested in any operation that generates returns, at least if it produces more cash for its owner. A start-up company needs to purchase or rent a building and machinery, recruit workers, and stockpile materials and supplies before it can make its first sale (Wu, Song, & Zeng, 2008). Women into shea butter processing can raise financial capital either from internal or external sources or both. The internal sources include savings of the firm's owner and the profits that have been retained and equity (Wu, Song, & Zeng, 2008). He and Baker (2007) revealed some external sources of financial capital that are opened to women in shea butter processing are trade credit and loans/ overdraft from financial institutions. Macrotrends (2018) reported that poverty rate in Ghana averaged 56.90% in 2016, a decline from 60.50% from 2012. However, the former three northern regions are reported to be the poorest regions in Ghana by Ghana living Standards survey (Macrotrends, 2018). Therefore, the volume of financial capital available to these women in shea butter processing in the Sagnarugu Municipality of Ghana can be said to be inadequate.

Social Capital

Social capital is much more difficult to quantify because if its qualitative nature. The term 'social capital' relates to an inventory of trust, common ground, common values, and socially held experience in current industrialized economies that enhances the social coordination of economic activity (Zhang, Min, & Zhang, 2017). Recognition of this idea is relatively recent and has been reinforced by the finding that social capital variations across cultures and societies

may help to explain some of the disparities in their economic growth. Aside social capital needed for formation of groups required for shea butter activities, shea butter processing itself generates social capital. It is believed that some perceived achievements of women into self-employed ventures such as shea butter processing is that of enhancement of social cohesion and consequently increasing the social capital in their communities, which implies better "social resources, including networks for cooperation, mutual trust, and support" (Atha, 2017).

Shea Butter Processing Systems

Basically, there are four major categories of people involved in the Shea butter industry, these actors are: Shea pickers, traders who buy directly from the pickers, Shea kernel and Shea butter processors and exporters (Segoe, 2010). Lovett (2013) presented a more elaborate stakeholder involvement in the Shea butter processing business. Village pickers and post-harvest processors of Shea kernel; local buying agents (LBAs); rural or urban traditional butter processors; large scale exporters of Shea kernel; small scale entrepreneurs formulating cosmetics based on Shea butter in Africa; external (US, EU, India and Japan) large scale buyers and process or kernel and butter; external companies formulating cosmetics; and external entrepreneurs formulating edible products including cocoa butter equivalents (CBEs) or Cocoa Butter Improvers (CBIs) based in Shea butter (Lovett 2013). In West Africa including Ghana, Shea butter extraction process is categorized into three main methods; traditional, semi mechanized and fully mechanized industrial system (Alhassan, 2012). These methods are discussed below;

Manual Traditional System of Production

The traditional method involves the following activities: harvest the nuts from the farm, accumulate in piles or pits, heat the nuts , boil (preferred) or roast, dry the whole nuts (if boiled), de-husk the nuts to get kernels (usually cracked by hand), dry the kernels, crush the kernels, dry roast the crushed kernels, mill or pounded/grind into a paste, kneaded (water-boiled or pressed) to form an emulsion to separate fats, boil the oil (fat) to dry and clean by decanting to clarify the butter, prepare for use, sale , or storage (cooled oil will congeal into solid white or cream colored (Wumpini, 2014). According to Jibreel et al., (2013), processing of Shea butter is a way of life for many women in Northern Ghana and the Sagnarigu Municipality in particular. While many of these women still use the traditional Shea butter processing method, they leant from their elders' years ago, others think the method involves lengthy, arduous processes requiring large quantities of fuel wood and water which are often carried from long distances. The large demand for labour, water and fuel wood by the traditional method of Shea butter processing and a possible environmental effect from large and continuous use of fuel wood have motivated many processors to acquire skills in alternative processing method perceived to use less of these resources (Kanwaljit et al., 2012).

Semi-Mechanized System of Production

Several attempts have been made to introduce new technologies into the gathering, storage and processing of Shea butter. Such technological advancement has led to an improvement extraction rate from 20 percent to 35-40 percent. The semi-mechanized method involves the use of grinders to take the place of pestle and mortars and these hands operated machinery reduces the amounts of firewood and water required. A nut crusher, roaster, a kneader or a hydraulic or screw press often complements the manual process and reduces drudgery of the traditional system (Emily, 2015). The semi mechanized method of Shea butter processing has also introduced an improved technology for roasting the kernel after it has been broken into tiny pieces. The improved roaster retains the heat in the compartment to roast the kernel at a reduced time, energy use (both fuel wood and human effort) and the processor exposure to the heat generated by the fire (Jibreel et al., 2013).

Fully Mechanize System of Production

According to the Institute for Development Studies (IDS) (2015), mechanized processing in West Africa yields 30-40% of Shea butter from

raw nuts; more efficient, but fully mechanized systems achieved extraction rates of between 42% and 50%. This is relatively higher, compared with 25% - 60% of extraction rates of the traditional and semi-mechanized systems (Jibreel et al, 2012). Most of the West African plants produce less than 25% of their installed capacity and operates only six months in a year in order to offset the high cost of storing Shea nuts throughout the year. Further research must however be carried out to find out the economic approach for storing Shea nuts in West Africa to enable processing plants function all year round. Fully-mechanized Shea butter processing method involves the use of fermentation/ parboiling tank, parboiled Shea fruit digester, bed drier, cracker/shell separator, roaster, milling machine, oven, basket oil presser, warehouses and or chemical solvents to extract the oil (Fox et al, 2013).

Role of Gender in Shea Butter Processing

Shea butter is of significant economic importance in countries that have shea trees and it provides an avenue that many women depend on for their livelihoods (Collins, 2014). According to Jibreel et al (2013), it is rare for men to participate in Shea nut gathering as it is regarded as the job of women and children in many African societies. NGO's emphasise the potential of the industry to reduce poverty levels among women. Shea nut and Shea butter production in Ghana has the potential of increasing employment availability to the economically vulnerable population, especially women. Farmers and women groups engaged in the Shea butter and groundnut business in the Upper West Region of Ghana have lost about GH¢5 million in revenue after their produce was downgraded on the international market for containing traces of a chemical pirimiphos Methyl (Hoetu,2017). The livelihoods of over 3 million women are now on the line as concerns are being raised about people cutting down the Shea trees that produce the nuts; the raw material for the trade. Majority of women in Northern Ghana depend on Shea butter processing for a livelihood, but continue felling of these economic trees is further widening the poverty gap (Holt et al., 2015). The Shea butter business is mostly a hereditary business and a motivation for female processors and it is not only for income but a way of life in Northern Ghana (Anieh et al. 2014). Women also preserve the cultural and social values of Shea butter. Majority of Shea butter is made traditionally by women who learned the methods from our elders and grandparents participating in this activity provide women a chance to engage with other women, thus fostering solidarity, unity, togetherness and expanded social networks among female participants (Collins,2014). According to UNDP (2010), women's access to wage employment in non-agricultural sectors has been weak, undermining the country's quest to promote gender equality as well as women's empowerment. In Ghana, women are underrepresented in wage employment and political decision making it undermines the effort of achieving gender equality and women empowerment.

Empirical Review

In their work "An Analysis of the Allocative Efficiency of Shea Butter Processing Methods in the Northern Region of Ghana". Issahaku, Al-Hassan and Sarpong (2010), stated that the agriculture industry in Ghana continues to be the main support in relation to the provision of food and jobs (Institute of Statistical, Social and Economic Research, 2011). Around 86 percent of the population are engaged in agriculture (shea butter processing) as a means of livelihood in the Upper West Region. Around 60 per cent of those participating in this economic activity are below the poverty line, with women being the majority of the poor. Thus, in view of the findings of Issahaku et al (2010), shea processing has a positive effect on the financial capital of rural women in the shea butter processing value chain. However, the level of influence is not significant. Thus, Shea butter processing have a minimal impact on the sustainable livelihood of these women.

Kent and Bakaweri, (2011) in their study, "Mechanisms to Ensure Participation in Shea Value Chain: A Case Study of two Interventions in Northern Ghana" buttressed the findings of Issahaku et al (2010) when they found that, for

the people of northern Ghana, shea nut is of tremendous importance in terms of women's income-generating activities. According to the findings of Kent and Bakaweri (2011), Shea butter processing is crucial to the enjoyment of higher standard of living by the women in the Savannah region. Thus, as it has over the years been regarded as feminine business, these women are able to raise some form of capital to enrich their livelihood.

According to Adams et al., (2016) in their work "The Shea Industry and Rural Livelihoods among Women in the Wa Municipality, Ghana", a large number of Ghana's rural people are faced with poverty, especially in northern Ghana, which has the highest levels of poverty. Despite the shea industry's ability to contribute to alleviating rural women's poverty, little attention has been paid to the sector. Their findings from a cross-sectional survey showed that as a key source of livelihood policy, 93.7 percent of women took part in the shea value chain. As high as 69.8% of the workers in the shea industry produce for both sustenance and commercial purposes; most of the respondents (96%) were involved in the collection of fresh nuts as well as processing of the nuts at home. This horrific statistic as found by Adams et al (2016) indicates that, the shea butter processing value chain has little to no influence at all in poverty alleviation and hence aiding the women achieve a sustainable livelihood. In effect, the average she abutter processing woman earns less than the monthly minimum wage rate in Ghana. An explanation is needed for the intense poverty in the region and a lack of sustainability in their livelihoods.

Methods

The Sagnarigu Municipality is one of the 260 Metropolitan, Municipal and Municipality Assemblies (MMDAs) in Ghana, and forms part of the 16 MMDAs in the Northern Region. The Municipality lies between latitudes 9°16' and 9° 34' North and longitudes 0° 36' and 0° 57' West with its administrative capital being Sagnerigu. The map is shown in Figure 2.

The Municipality shares boundaries with the Savelugu - Nanton Municipality to the north, Tamale Metropolis to the south and east, Tolon Municipality to the west, and Kumbungu Municipality to the north-west. The Municipality covers a total land size of 200.4km² and has a population of 163,513, out of which 80,833 are females and 82,680 are males. The average household size in the Municipality is 5.2 members.

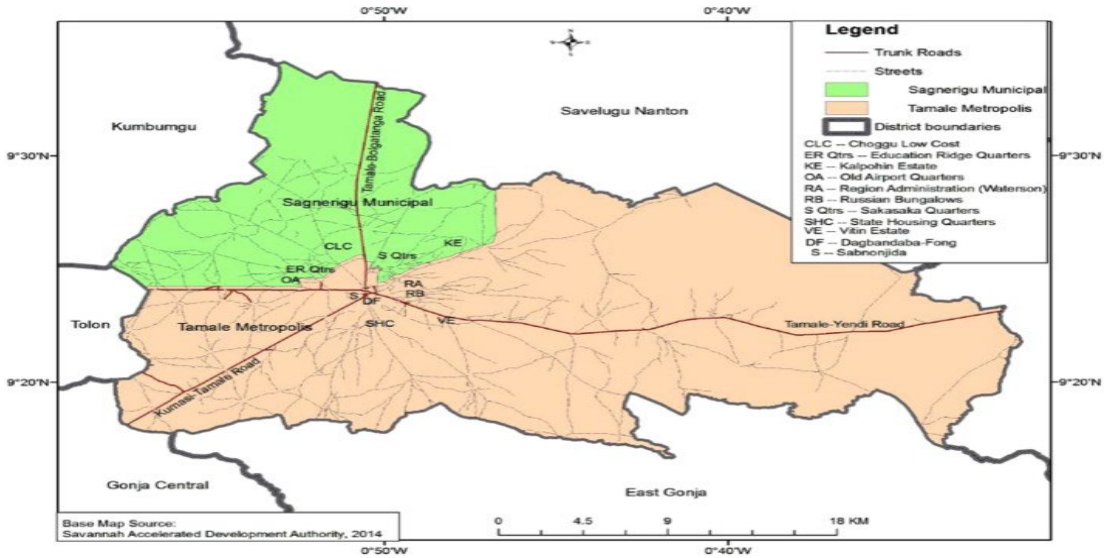

Figure 2. Map of Sagnarigu Municipal Carved out from Tamale Metropolitan Assembly

The total population of the Municipality is 148,099 with males constituting 50.6 percent (74,886) and females constituting 49.4 percent (73,213). Again, it has a very young population where 48.8 percent of the population falls between ages 0-19 years. The aged (65+), constitute only 4.1 percent of the total population in the municipality. The age group 0-4 has the highest proportion of 14.1 percent with those 95+ recording the lowest proportion of 0.1 percent.

The sex ratio, which represents the number of males to 100 females for the Municipality is 102.3. It can be seen that male population in the Municipality is greater than that of the female population from 0 – 24 years and age 25years and above, females outnumber males. This shows that at birth, there are more males than females and as the population grows older, there are more females than males.

The study adopted pragmatism as research philosophy, where mixed method was used as an approach to the study. Pragmatism is based on the proposition that researchers should use the philosophical and/or methodological approach that works best for the particular research problem that is being investigated (Tashakkori & Teddlie, 1998). It is often associated with mixed-methods or multiple-methods (Creswell & Clark 2011), where the focus is on the consequences of research and on the research questions rather than on the methods. This study is devoted to pointing out key livelihood modes of women that engage in shea butter processing. This study employed both descriptive and explanatory research designs to reveal the reality of the livelihood of women that are engaged in shea butter processing.

The study population is made up of women that are into shea butter processing in the Sagnarigu Municipality in the Northern Region of Ghana. The Municipality has five main shea butter processing centres. The women groupings and members in each group at the centres are shown in Table 1

Table 1. Population Distribution for the Study

Processing Center	Processing Group	Population
Kafiayili	Kafiyili	126
Kumboyili	Christian Mothers	50
	Diveela	18
	Maltiti	48
Sagnarigu	Sagnarigu	65
Gumo	Gubdanda	60
	Suhiyini	25
	Tibomyem	50
Malshegu	Yurilim	50
	Chetiwuni	70
	Suhuyini	40
Total		**602**

Source: Field Survey, 2023

The sample size was obtained using Yamane (1967) statistical method, which was;

$$n=\frac{N}{1+N(e)^2} \quad (1)$$

Where N = population of women into shea butter processing at all the centers

e= level of significance 5 present (0.05)

n = sample size of the entire population

Applying the formulae for 602 women processors, the study used 240 women processors and the computations is shown as follows;

$$n=\frac{602}{1+602(0.05)^2}$$

n= 240.32

n=240

The study further employed proportional representation to determine the sample for each centre and group as shown in Table 2.

Table 2. Sample Distribution for the Study

Processing Center	Processing Group	Total Membership to each processing Group	Relative Frequency (rf)	Sample Size (rf*240)
Kafiayili	Kafiyili	126	0.2093	50
Kumboyili	Christian Mothers	50	0.0831	20
	Diveela	18	0.0299	7
	Maltiti	48	0.0797	19
Sagnarigu	Sagnarigu	65	0.1080	26
Gumo	Gubdanda	60	0.0997	24
	Suhiyini	25	0.0415	10
	Tibomyem	50	0.0831	20
Malshegu	Yurilim	50	0.0831	20
	Chetiwuni	70	0.1163	28
	Suhuyini	40	0.0663	16
Total		**602**	**1.0000**	**240**

Source: Field Survey, 2020

The study further selected each centre leader from each centre for interview. In all, five centre leaders were interviewed aside the 240 respondents who engaged in the questionnaire administration.

This study used probability sampling known as simple random sampling to sample the respondents for the quantitative study. To meet the principles of simple random sampling, the authors obtained the names of all women in each processing centre. The authors used the lottery method to select the respondents for each group. However, the 5 centre leaders were purposively sampled for the interview.

The study used structured questionnaire and interview guide as data collection instruments. The questionnaire was based on the framework proposed by Scoones (1998) on the five capitals of sustainable livelihood. The questionnaire was piloted on 10 women into shea butter processing at Malshegu in the Sagnairgu Municipality. The pilot data was subjected to reliability and validity tests. The reliability test with Cronbach Alpha produced Cronbach Alpha score of 0.816 indicating that the questionnaire was reliable. The Principal Component Analysis for validity produced Factor Loading of at least 0.7 for each item for each construct under sustainable livelihood with Kaiser Meyer Olkin (KMO) of at least 0.8 for each sustainable livelihood construct.

The analysis was carried out within the framework of both qualitative and quantitative procedures. The quantitative data were edited, coded, cleansed and entered into SPSS version 21. The presentation and analysis involved descriptive statistics such as frequencies and percentages, mean, standard deviation and independent- Samples t test.

The independent-Samples t test was use to analyze the effect of engagement in shea butter processing on sustainable livelihood of women. It helped to test for statistical significance difference between mean responses for elements of sustainable livelihood of women (for example, financial capital, natural capital, social capital and physical capital of women) before and after engagement in shea butter processing. The qualitative analysis was done using narrative method. The study merged the findings from the quantitative and qualitative studies for discussions.

Results

Socio-demographic Characteristics of Respondents

This section of the analysis focused on the socio-demographic characteristics of respondents. The results are illustrated in Table 3.

Table 3. Socio-demographic Characteristics of Respondents

Variable	Category	Frequency	%
Age	Under 20	39	16.25
	21-30	65	27.08
	31-40	45	18.75
	41-50	58-	24.17
	Above 50	33	13.75
Marital status	Single	45	18.75
	Married	139	57.92
	Divorced	35	14.58
	Widow	21	8.75
Number of children	None	45	18.75
	1-4	89	37.08
	Above 5 children	106	44.17
Highest education level	No formal education	102	42.5
	Basic education	65	27.08
	Secondary education (SHS/Vocational/technical)	45	18.75
	Diploma	13	5.42
	Bachelor	7	2.92
	Post graduate	5	2.08

Source: Field Data (2021)

The results in Table 3 indicate that 39 (16.25%) and 65 (27.08%) were under 20 years and between 21-30 years respectively. Also, 45 (18.75%) were between 31-40 years, 58 (24.17%) were between 41-50 years and 33 (13.75%) were above 50 years. Table 3 shows that 45 (18.75%) were single and 139 (57.92%) were married. 35 (14.58%) also were divorced and 21 (8.75%) of the respondents were widows.

Table 3 further shows that 45 (18.75) of the respondents had no children, 89 (37.08%) and 106 (44.17%) of the respondents also had between 1-4 children and above 5 children respectively. It is again shown in Table 3 that 102 (42.5%) had no formal education and 65 (27.08%) had basic education. 45 (18.75%) of the respondents had secondary education, 13 (5.42%) had Diploma, 7 (2.92%) had Bachelor Degree and 5 (2.08%) of the respondents had post graduate education.

Effect of Shea Butter Engagement on Access to Natural Capital

This considered whether women engagement in shea butter processing has had positive influence on their access to natural capital with emphasis on land ownership and the result is summarized in Table 4.

Table 4. Effects on Natural Capital

Indicators	Items	Item	Before	After	Before (Mean score)	After (Mean score)	p-value
Natural capital	Land size (access to land)	No land	65 (27.08%)	0 (0.0%)	1.7958	2.2917	0.000
		1-4 acres	159 (66.25%)	170 (70.83%)			
		More than 5 acres	16 (6.67%)	70 (29.17%)			
	Use of land	Farming activities	91 (52.00%)	121 (50.42%)	-	-	-
		Expansion of business	49 (28.0%)	62 (25.83%)			
		Building	35 (20.0%)	57 (23.75%)			

Source: Field Data (2021)

The results as shown in Table 4, 65 (27.08%) of the respondents had no access to land before the shea butter intervention program. However, 159 (66.25%) and 16 (6.67%) of the respondents had access to 1-4 acres and more than 5 acres of land respectively before the shea butter intervention. As such, not all the respondent had access to lands but it was the other way around after the shea butter intervention. From Table 4, 170 (70.83%) of the respondents had access to 1-4 acres and 70 (29.17%) had access to more than 5 acres of land. Before the shea butter intervention, 91 (52.00%), 49 (28.00%) and 35 (20.00%) of the 175 respondents who had access to lands used the lands for farming activities, expansion of business, building respectively. After intervention, the used of land for farming activities, expansion of businesses and building purpose improved.

Considering the Independent Samples t test, mean score for land access was significantly higher for after than before the shea butter engagement (p-value<0.000). This implies that, women's engagement in shea butter has significantly improve their access to land for various uses.

On the effect of women's engagement in shea butter processing on women's access to land, these are some of statements made by some of the interviewees;

> *"I have not regretted my decision to involve myself in the shea butter business. It is good. Now I can boast of one plot of land. Though I was not allowed to buy land directly, I bought the land through my brother and the documentation done in my name" (Key Informant, 40 years, Sagnarugu Group).*

> *"Though I do not own the land but I have been given three acres of land for cultivation of yam. Before I entered into this business, I asked for some land for cultivation but I was not given. They now know I can cultivate the land, so they have given me some land for cultivation" (Informant, 33 years, Chetiwuni Group)*

Effect of Shea butter processing on Financial Capital

This considered whether women engagement in shea butter processing has had positive influence on their finances; with emphasis on savings, investment, access to credit and the responses are shown in Table 5.

Table 5. Effects on Financial Capital

items	Category	Before	After	Before (Mean Score)	After (Mean Score)	p-value
Amount saved	Less than GH¢100 GH¢100-300 Above GH¢ 300	98 (40.83%) 113 (47.08%) 29 (12.08%)	46 (19.17%) 79 (32.92%) 115 (47.92%)	1.7125	2.2875	0.000
Amount invested	No investment Less than GH¢1000 GH¢1000-3000 AboveGH¢3000	63 (26.25%) 99 (41.25%) 76 (31.67%) 2 (0.83%)	9 (3.75%) 67 (27.92%) 94 (39.17%) 70 (29.17%)	2.0708	2.9373	0.000
Access to credit	Difficult Quite easy Easy Very easy	120 (50.0%) 94 (39.17%) 16(6.67%) 10(4.17%)	90 (37.5%) 100(41.67%) 25 (10.42%) 35 (14.58%)	1.6500	2.0625	0.000
Sources of loans	Groups Family & relative Banks	140(58.33%) 70 (29.17%) 30(12.5%)	45 (18.75%) 12 (5.0%) 183(76.25%)	-	-	-

Source: Field Data (2021)

As shown in Table 5, 98 (40.83%) of the respondents saved less than GH₵100 per month before the Shea butter intervention and the remaining 113 (47.08%) and 29 (12.08%) saved GH₵100-300 and above GH₵300 respectively before the Shea butter intervention. As such, because majority of the respondents had a low rate of savings, there was a corresponding low rate of investment. As shown in Table 5, 63 (26.25%) had no investments before the shea butter intervention and 99 (41.25%) invested less than GH₵1000 during that period whiles 76 (31.67%) invested between GH₵1000-3000 and 2(0.83%) invested above GH₵3000 before the shea butter intervention. There was an improvement in savings and investment after the shea butter intervention.

Table 5 shows that 46 (19.17%) saved less than GH₵100 and 79 (32.92%) saved between GH₵100 and 300 respectively. Also, 115 (47.92%) of the respondents saved more than GH₵300 after the shea butter intervention. Subsequently, 9 (3.75%) of the respondents had still not engaged in any investment opportunities after the shea butter intervention program; but 67 (27.92%) had invested less than GH₵1000. Also, 94 (39.17%) of the respondents had invested between GH₵1000 and 3000 and 70 (29.17%) had invested above GH₵3000 after the shea butter intervention.

As indicated in Table 5 120 (50.0%) of the respondents were of the belief that access to credit was difficult and 94 (39.17%) indicated that access to credit was quite easy before the shea butter intervention and 16 (6.67%) indicated that access to credit was easy and 10 (4.17%) noted that access to credit was very easy.

Before the shea butter intervention, 140 (58.33%) of the respondents had access to loans through groups, 70 (29.17%) had access to loans through family and relative and 30 (12.5%) had access to loans through banks. Access to loans through banks improved after the shea butter intervention as 183 (76.25%) of the respondents had access to loans through banks. Also, 45 (18.75%) of the respondents had access to loans through groups and number of respondents that accessed loans through family and relatives reduced to 12 (5.0%) after the shea butter intervention.

From the Independent-Samples t test, engagement in shea butter processing has significantly improved the amount saved (p-value <0.000), amount invested (p-value< 0.000) and access to loans (p-value <0.000).

In interviews with some of the groups, some of the interviewees noted the following;

> *"Shea butter business is not all that good; it is not bad either. Now I have money to take care of myself and the family. I can save money to help me take care of some emergencies and personal needs. I save around 300 cedis every month. Before, I was not able to save any money and I was facing financial hardship" (Key Informant, 35 years, Sagnarugu Group).*

> *"My group has a susu scheme and I save 10 cedis daily and I now have some money to take care myself and the family. I am not as poor as before and I do not depend on my husband again. I even support him" (Key Informant, 32 years Christian Mother Group).*

> *"The shea butter business has helped me. Aside my daily savings with my susu group, I save with a bank. I save about 200 cedis a month with the bank and 20 cedis a day with my susu group. Through the savings, I am able to get some loans from my bank and the susu scheme. I am happy I joined this business" (Key Informant, 27 years, Suhiyini Group).*

Effect of Shea Butter Processing on Social Capital

This section of the study focused on effect of women's engagement in shea butter processing on their social capital. Social capital focused on membership in reputable organization with aim of women empowerment, and benefits derived from the organization. The responses on them are shown in Table 6.

Table 6. Effects on Social Capital

Items	Category	Before	After	Mean Score (Before)	Mean Score (After)	P-value
Member of any organization	Yes No	56 (23.33%) 184 (76.7%)	200 83.33%) 40 (16.67%)	1.2292	1.8333	0.000
Position held	Yes No	12 (5.0%) 228 (95.0%)	71 (29.6%) 169 (70.4%)	1.0234	1.2573	0.000

Source: Field Data (2021)

The results as shown in Table 6 shows that 56 (23.33%) of the respondents had joined associations or groups before the shea butter intervention and 186 (77.5%) did not join any organization or association before the shea butter intervention. Out of the 56 respondents that joined the various organizations before the intervention, 12 (5.0%) had executive positions and the remaining were ordinary members.

However, after the shea butter intervention in the community, 200 (83.33%) of the respondents joined associations whereas 40 (16.67%) did not join any association. Out of those who joined association, 71 (29.6%) had held executive positions and the remaining has no executive positions.

The Independent-Samples t-test shows that women participation in association significantly improved after their participation in shea butter processing (p-value<0.000). Also, position held by the women in the association significantly improved after their involvement in the shea butter processing activities (p-value <0.000).

In the interview, some of the women disclosed that shea butter processing business has had positive effect on their social capital. One of them said as follows:

> *"I am now an executive member in my community. I am the secretary of the Women Group in my community. I was appointed just last year" (Key Informant, 27 years, Suhiyini Group).*
>
> *"My family now respect me because I can now support the family financially. My views on family issues are respected. But before, I could not even talk during family gathering" (Key Informant, 35 years, Sagnarugu Group).*

Effect of Shea Butter Processing on Physical Capital

This section of the study focused on effect of women's engagement in shea butter processing on their physical capital. Physical capital focused on consumption of durable items and the responses are shown in Table 7.

The results as shown in Table 7 shows that 129 (53.75%) of the respondents had radios before the shea butter intervention and 111 (46.25%) did not have radios before the shea butter intervention. The situation improved after the shea butter intervention because 189 (78.75%) now had radios while 51 (21.25%) of the respondents still did not have radios.

As shown in Table 7, 76 (31.67%) of the respondents before the shea butter intervention possessed television set whereas 164 (68.33%) did not have television set. After the shea butter intervention, however, 212 (88.33%) of the respondents possessed television set whereas 28 (11.67%) did not still have televisions. It is also shown in Table 7 that 62 (25.83%) of the respondents had cell phones and 178 (74.17%) did not have cell phones before the shea butter intervention. Improvement is witnessed as 230 (95.83%) of the respondents were able to acquire cell phones while 10 (4.17%) still did not have cell phones.

Table 7. Physical Assets Owned by Households

Items	Category	Before	After	Mean Score (Before	Mean Score (After)	p-value
Radio	Yes No	129 (53.75%) 111 (46.25%)	189 (78.75%) 51 (21.25%)	1.3250	2.0000	0.000
Television	Yes No	76 (31.67%) 164 (68.33%)	212 (88.33%) 28 (11.67%)	1.2000	2.0000	0.000
Cell phones	Yes No	62 (25.83%) 178 (74.17%)	230 (95.83%) 10 (4.17%)	1.2167	2.0000	0.000
Bicycle	Yes No	134 (55.83%) 106 (44.17%)	187 (77.92%) 52 (21.67%)	1.3417	2.0000	0.000
Motorbike	Yes No	78 (32.5%) 162 (67.5%)	197 (82.08%) 43 (17.92%)	1.1458	2.0000	0.000
Refrigerator	Yes No	54 (22.5%) 186 (77.5%)	191 (79.58%) 49 (20.42%)	1.0208	2.0000	0.000
Fan	Yes No	141 (58.75%) 99 (41.25%)	224 (93.33%) 16 (6.67%)	1.5208	2.0000	0.000

Source: Field Data (2021)

Before the shea butter intervention 134 (55.83%) of the respondents had bicycles whereas 106 (44.17%) did not have bicycles. 187 (77.92%) of the respondents, after the shea butter intervention, were able to acquire for themselves bicycles whereas 52 (21.67%) still did not have bicycles. It can again be shown in Table 7 that 78 (32.5%) of the respondents had motor cycles whereas 162 (67.5%) did not have motor cycles before the shea butter intervention. After the shea butter intervention, however, 197 (82.08%) were able to acquire motorbikes whereas 43 (17.92%) did not have motorbikes.

The results as shown in Table 7 shows that 54 (22.5%) of the respondents possessed refrigerators before the shea butter intervention whereas 186 (77.5%) did not have refrigerators before the shea butter intervention. After the shea butter intervention, 191 (79.58%) of the respondents acquired for themselves refrigerators whereas 49 (20.42%) of the respondents still had not gotten for themselves refrigerators. The results as portrayed in Table 7 shows that 141 (58.75%) of the respondents possessed fans before the shea butter intervention whereas 99 (41.25%) did not have fans before the shea butter intervention. After the shea butter intervention, 224 (93.33%) of the respondents acquired for themselves fans whereas 16 (6.67%) of the respondents still had not gotten for themselves fans.

Table 7 shows that 23 (9.53%) of the respondents possessed refrigerators before the shea butter intervention whereas 217 (90.42%) did not have refrigerators before the shea butter intervention. After the shea butter intervention, 150 (62.5%) of the respondents acquired for themselves refrigerators whereas 90 (37.5%) of the respondents still had not gotten for themselves refrigerators.

From the Independent-Samples t test, almost all the respondents significantly had physical assets (radio, television, cell phone, bicycle, motor bicycle, regenerator and fan) after joining the shea butter processing.

Discussions

From the qualitative and quantitative analyses done, it is revealed that the engagement of women in shea butter processing has significantly improved their financial, natural, social and physical capital and livelihood. This could be attributed to the fact that shea nut and butter is of significant importance in terms of generation of income especially in Northern Ghana. Kent and Bakaweri (2011) indicate that shea butter processing is crucial to the attainment of higher standard of living by women in Northern Ghana. Therefore, it has over the years been regarded as a business where women raise some capital to enrich their

livelihood. Traditionally, shea butter is a woman's business and it is a source of income for many families in rural areas (Carrettle et al., 2009). According to a report by Stichting et al, (2006), more than 600,000 women in northern Ghana depend on shea butter for incomes as a means of their daily sustenance to supplement family food budget and meet medical and educational expenses. The study by SNV further concluded that shea butter extensively supports the livelihoods of both rural and urban households in northern Ghana (Stichting et al, 2006). This is buttressed by Aduse-Poku et al, (2017) who posits that, Processing shea butter is a key supplementary livelihood practice in Northern Ghana with most women. Adams et al (2016) stated that shea butter industry has made massive contribution towards poverty alleviation. Collins (2014) indicate that shea butter industry serves as a key way to escape the poverty trap for women who are forced to work to augment family income as it gives them the ability to make a living (Collins, 2014). This shows Shea Butter Processing's positive effect on the livelihoods of these women in the venture. The findings are consistent with the opinion of (Atha, 2017). Atha (2017) noted that some perceived achievements of women into self-employed ventures such as shea butter processing is that of enhancement of social cohesion and consequently increasing the social capital in their communities, which implies better social resources, including networks for cooperation, mutual trust, and support. The former head of the Federation of Rwenzori Microfinance Association explains that people are attracted to join social groups because of its social positivity: "people can socialize and share info when meeting. Zhang, Min and Zhang (2017) indicated social benefits derived from shea butter processing include access to human capital, information on the women, labour capacity, skills and educational level, good health, and physical capability. Aduse-Poku et al., (2017) and Malachi (2014) asserts a significant positive relationship between shea butter processing and sustainable livelihood of these rural women

Conclusion

Shea butter processing in the northern part of Ghana is regarded as a very profitable business and so women that are involved in its processing are much respected in their communities since many have been able to accomplish a lot in life through this business. This study proves that the livelihood of women engaged in Shea butter processing has a sound leverage since these women are mostly targeted by government and NGO's whenever the topic of women empowerment in the northern part of Ghana rises. The study concludes that the engagement in Shea butter processing significantly improves livelihood of women through increase in natural, financial, physical, and social capitals.

The study recommends for integrated shea butter processing policy in Ghana, where value is added at each supply chain of shea butter processing. This would enhance job creation for many women in the shea butter processing communities and their environs for sustainable livelihood. The study further recommends that women in these shea butter processing centres should be given the necessary support (skill and technology) by government and NGOs to improve value creation in the shea butter processing business to improve their livelihood more sustainably.

The study was faced with some challenges and majority of them was due to poor record keeping practices of the women in the shea butter processing business. In view of this, the authors faced challenges in acquiring the specific figures that were needed for assessing the financial capital of the respondents. Therefore, the respondents were asked to give estimated figures which many be different from actual figures.

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