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Assessing the Challenges of Shea Butter Processing on Sustainable Livelihood of Women in the Sagnaregu Municipality of the Northern Region of Ghana

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Abstract

This study assessed women and sustainable livelihoods with focus on selected shea butter processing centers in Sagnarigu Municipal Assembly of the Northern Region, Ghana. The objectives of the study were to determine the challenges confronting women into shea butter processing and to examine the extent to which these challenges undermine sustainable livelihood of women. This study adopted the explanatory research designs with the quantitative research strategy. The study used structured questionnaire to gather data from 240 women. The study used Structural Equation Model to identify the challenges that significantly undermine sustainable livelihood of women. Start-up capital and credit for equipment, raw material and labor were financial challenges. Leadership, conflicts on transparency and accountability and social status were social challenges. Inadequate technical skills, poor management skills, poor record keeping were human capital challenges. Poor road network, inadequate storage facilities were physical challenges. Poor community and governmental relationship was the major institutional challenge. This study recommends urgent need to address institutional, natural capital and financial challenges confronting women into shea butter processing in the study area.

Keywords: shea butter, women processors, sustainable livelihood, Sagnarigu Municipality, challenges

1. Introduction

Shea butter generates series of economic activities to people living in the communities where they are grown. Until recently, shea butter processing was not considered as a source of poverty alleviation and sustainable livelihood for women in Northern Ghana although these women are mostly engaged in shea butter processing for their livelihood. 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, Adams et al., (2016) noted that many women in the Wa Municipality, Ghana are engaged in shea butter processing, yet most of them are poor. They attributed this to inadequate access to investment capital; felling of live shea trees; absence of modern processing equipment and skill training; and reduced pricing of shea products in the local market.

Some previous studies have attempted to look at these and other issues regarding shea butter processing and sustainable livelihood of women. For example, Kent and Bakaweri (2010) noted that shea butter production and processing is challenged by weather and therefore, the activity is seasonal; thus, affecting plant capacity utilization of processing firms. Deforestation has also become a big problem in Ghana; and it affects the availability of shea nuts. Also, McNally (2008) attributed the slow growth of shea butter industry to bushfires, cutting of trees for firewood, and destructive farming methods. 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.

Ademola et al (2012) carried out a study entitled "Assessment of Shea Butter processing among Rural Dwellers in Atisco Local Government area of Oyo State, Nigeria using 120 study participants. The result of the study indicated that there were limited market opportunities for the product and limited credit facilities and processing equipment are the major constrain confronting the Shea Butter industry.

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 is faced with poverty, especially in northern Ghana, which has the highest levels of poverty. Despite the shea sector's ability to contribute to alleviating rural women's poverty, little attention has been paid to the sector. The major problems these women are facing in the shea industry they found to includes the following. Inadequate access to investment capital; felling of live shea trees; absence of modern processing equipment and skill training; and reduced pricing of shea products in the local market.

Banye (2021) in his work, "Improving Rural Livelihoods through Shea Butter Businesses, a Case of Women in Markets in Northern Ghana" sought to explain the unsustainable nature of the Shea Butter processing to the livelihoods of the rural women. He argued in his findings that seasonal variations in the availability of shea nuts have an effect on prices, so the opportunity to buy and store nuts stabilizes the prices for female processors. However, women are frequently forced to sell at low rates due to the short-term need for cash, and it is reported that some middlemen benefit from margins of 300-500 percent as a result. These women are thus pressured to sell their goods below the asking price, which explains why they earn lower incomes in the process.

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. Either large quantities of shea nut remain unprocessed annually or few processed butter 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).

This clearly gives the indication that engagement in shea butter processing does not automatically improve the sustainable livelihood of women, thus, calls for investigation into the causes of low sustainable livelihood of women into shea butter processing and possible remediation. Therefore, the study seeks to investigate the challenges confronting women in shea butter processing and the extent to which these challenges undermine sustainable livelihood of women in the Sagnarigu Municipality.

2. Theories Underpinning the Study

2.1 Theory of Sustainable Livelihood

Chambers and Conway (2000) view livelihood as made up of 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 (2002) on their part define the concept of livelihoods to encompass the wider context of governance, institutions, and enabling environment for poverty alleviation.

In the opinion of Khatiwada et al, (2017), livelihoods 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

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. 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 show the components of sustainable livelihood.

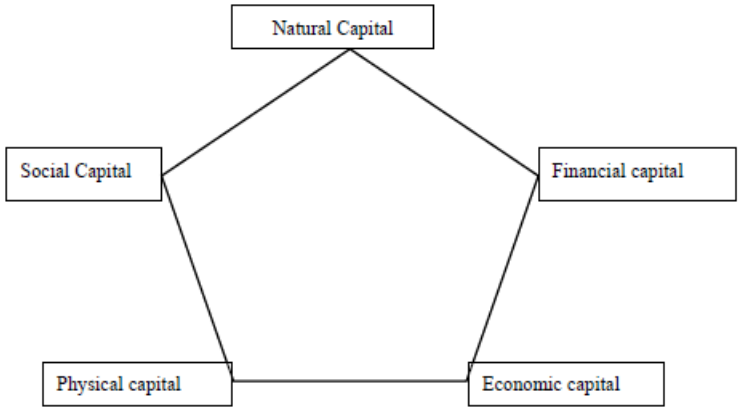

Figure 1. The Five Capitals of Sustainable Livelihood (Scoones, 1998)

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;

2.1.1 Natural (Environmental) Capital

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). Uncontrollable factors such as weather make yield uncertain. The supply of shea nut is therefore seasonal (Kent & Bakaweri, 2010), thus, affecting plant capacity utilization of processing firms.

Aside this, 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.

2.1.2 Physical Capital

Physical capital are 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.). Physical capital is different from natural capital, in that physical capital is man-made whiles natural capital is created by God. 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). Minister of Roads and Highways Report on Road network (2020) noted that 48% of the roads in the Northern region are poor. This indicates an inherent inadequacy of physical capital in the Northern Region of Ghana.

2.1.3 Human Capital

Human capital has been identified as one of the key constrained to improved shea butter processing. In a study to evaluate the market access of shea not processing in Ghana, Alhassan (2012) observed that people inability in accessing the market is due to several factors; their skills in entrepreneurship is poor, they rely so much on traditional methods and the fact that they do not have any training to acquire the necessary skills. In the opinion of Planet (2010), lack of orientation in the shea business and the skills and the tools required to produce the demands of the market.

2.1.4 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. The women can access loan through banking and non-bank institutions.

Banking financial institutions are the main external fund providers for firms both in developing and developed economies (Vera & Onji, 2010). Though bank financing is not cheap in comparison with other sources of finance, it does generate more incentives for a firm. Due to opaque nature of the information of some SMEs, some banks rely on factoring which is a way of raising short term finance with the account receivables of a client being purchased by a bank or special firm at an agreed fee with interest (Soufani, 2002).

Trade credit is a delay in the payment of goods and services due to an agreement between the firm and the supplier (Garc á-Teruel & Mart ínez-Solano, 2010). The basic concern for this sort of financing is attitude towards the agreement. Trade credit is very crucial source of financing for most young small and medium scale enterprises since they have insufficient collateral for external debt (Fatoki & Odeyemi, 2010). 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. 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.

2.1.5 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. Most frequently, it refers to the characteristics of a society that fosters collaboration between groups of people (e.g., employees and managers) whose collective, interdependent efforts are required to accomplish a shared purpose, such as efficient production (Zhang, Min, & Zhang, 2017).

Aside social capital needed for formation of groups required for shea butter activities, shea butter processing itself generate 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). The former head of the Federation of Rwenzori Microfinance Association explains that people are attracted to join micro businesses because of its social benefit: "people can socialize and share information during meeting

3. Materials and Methods

3.1 Research Design and Approach

This study employed the explanatory research design. This is because the explanatory research design offers the opportunity to study cause and effect of a phenomenon, using statistical tools and analysis. This study also employed the quantitative research approach to analyze sustainable livelihood of women into shea butter processing. This study used quantitative research approach for one main reason. It helps in generalization of study's outcomes to the entire population. According to Agyedu et al. (2010), it is difficult for a study to collect data from the entire population due to financial, time and reluctant of some individuals to provide data. Therefore, the quantitative research approach helped the study to generalize its outcomes to the entire women into shea butter processing in the Sagnarigu in the Northern Region of Ghana.

3.2 Target Population

The study population is made up of women 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, 2021

3.2.1 Sample Size and Sampling Techniques

The sample used to administer the questionnaire was obtained using Yamane (1967) statistical method, which was; $n=\frac{N}{1+N(e)^2}$

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

Thus, applying the formulae for 602 women processors

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

n= 240.32

n=240

Thus, the sample size for the study is two hundred and forty (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, 2021

the researchers used probability sampling known as simple random sampling in this study. Simple random sampling is a type of sampling where each member within the study population has equal chance of being selected. This implies that for this study every member within a group had equal chance of being selected. This removed the likelihood of sampling

bias. Within each group at each centre, the study used lottery method in which the research wrote the names of all the member s in each group on pieces of papers. The researcher put the pieces of papers for each group into separate containers. The containers were shaken and papers were picked one after the other without replacement from each container until the required number of sample size for the group was obtained.

3.3 Data Collection Technique

3.3.1 Questionnaires

For quantitative analysis (data collection) questionnaires were used to collect data. The questionnaires covered issues on the challenges of Shea butter processors in the Municipality. Other aspects of the questionnaires also include how the challenges in Shea butter processing affect women's sustainable livelihood. The researchers constructed the questionnaire according to the objectives of the study. The questionnaires were in five (5) sections indicated with alphabets A to E consisting of both closed and open-ended items (the measurement variables were based on the nominal and ratio scales). Section A dealt with the demographic information of the respondent's while section B covered the production challenges of Shea butter processors in the Municipality and Section C was on how challenges in shea butter processing affect women's sustainable livelihoods.

3.4 Data Processing and Analysis

The analysis was carried out within the framework of quantitative procedure. 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 and standard deviation; Independence Samples t- test and multiple regression. For quantitative analysis of data, the ordinal variables were designed and collected by a Likert – scale on the various levels captured in the questionnaire. The level of responses corresponding to the scale helped in the analysis and interpretation of the results. The index for responses includes "strongly agree", ''agree", "neutral" (not able to agree or disagree), "strongly disagreed" and "disagreed". The detail of the index for the responses is shown in Table 3 below.

Table 3. Interpretations of Likert Scale Questions

Scale	Interpretation
1	Strongly disagreed
2	Disagreed
3	Neutral
4	Agree
5	Strongly agreed

Sources: Authors construct (2021)

The independence 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. To determine the extent to which the challenges of shea butter processing influence sustainable livelihood of women, this study employed multiple Ordinary Least Square. Here, sustainable livelihood composite index was constructed through Principal component analysis and it was used as dependent variable. The study further constructed composite index for each of the challenge (financial, social, physical, human, natural and institutional challenges) and used them as independent variables. the study further controlled for socio-demographic characteristics of the women (for example age, educational level, marital status and number of children) since these can also influence sustainable livelihood of women.

3.5 Ethical Considerations

Consent was sought from the respondents. They were assured of the protection of their rights. The main reason for the study was disclosed to all the respondents. They were notified that the study was not in any way an attempt to disclose any perceived secrets about them. All respondents were guaranteed the confidentiality of the data provided during the study.

4. Results and Discussions

4.1 Descriptive Statistics

This section presents the descriptive statistics of the data. The study administered 240 questionnaires which were filled-in and returned to the researchers. The study shows the results of the Cronbach's Alpha for reliability test, Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy, Bartlett's Test for sphericity and factor loading. The descriptive statistics for the section of instruction, challenges of shea butter processing are shown in Table 4.

Table 4. Reliability Test, Sampling Adequacy Test and Factor loading (Challenges of Shea Butter Processing)

Main variable	Statement	Factor loading	KMO	Bartlett Test
Financial capital	Start-up capital	0.985	0.500	Chi
	Credit for equipment, raw material and labor	0.985		square=675.494
				P value=0.000
Social capital	Group dynamics	0.956	0.870	Chi
	Leadership	0.926		square=2320.2197
	Conflicts on transparency and accountability	0.852		P value= 0.000
	Gender	0.955		
	Social status	0.951		
Human capital	Inadequate training	0.931	0.872	Chi
	Technical skills	0.854		square=3452.1157
	Technical supporting skills	0.929		P value = 0.000
	Information asymmetry	0.889		
	Level of education	0.873		
	Poor management skills	0.945		

	Poor record keeping	0.925		
Physical capital	Poor road network	0.940	0.804	Chi square =1654.0563
	Poor market infrastructure	0.854		P value = 0.000
	Inadequate shelter and storage facilities	0.952		
	Insufficient equipment	0.972		
Natural Capital	Land access difficulty and conflict	0.913		
Institutional capital	Market structure and forces	0.918	0.851	Chi square =2121.8578
	Poor community and governmental relationship	0.979		P value = 0.000
	Government institutional dynamics	0.979		
	Lack of laws and services that enhance production processes	0.977		

Source: Field Data (2021)

From Table 4, the Principal Component Factor Analysis shows coefficient of KMO to be greater than 0.5 with Bartlett's Test (significance value less than 5%) and this satisfies the test requirement. From Table 4, factor loadings are greater than 0.8 and this indicates that the observed variables correlate with each other and the total variable. According to Hair et al. (2006), loading factor greater than 0.4 is sufficient. The summary statistics on elements of sustainable livelihood of women is shown in Table 5.

Table 5. Reliability Test, Sampling Adequacy Test and Factor loading (Sustainable Livelihood of Women)

Main variable	**Statement**	**Factor loading**	**KMO**	**Bartlett Test**
Natural capital	Land size	0.668	0.500	Chi-Square=49.132
	Use of land	0.668		P value=0.000
Financial capital	Amount saved	0.898	0.821	Chi-Square=1835.674
	Amount invested	0.881		P value=0.000
	Access to credit	0.798		
	sources of loans	0.822		
Social capital	Member of any organization	0.990		
	Benefits of the group joined	0.990		
	Any form of training during the period	0.987		

	Duration of training	0.087

Source: Field Data (2021)

From Table 5, the Principal Component Factor Analysis shows coefficient of KMO to be greater than 0.5 with Bartlett's Test (significance value less than 5%) and this satisfies the test requirement. From Table 5, all factor loadings are greater than 0.6 and this indicates that the observed variables correlate with each other and the total variable.

4.3 Socio-demographic Characteristics of Respondents

The results on socio demographic characteristics of women processors in Sagnarigu Municipality are illustrated in Table 6.

Table 6. 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
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 6 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 respectively. Table 6 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. It is again shown in Table 6 that 102 (42.5%) had no formal education and 65 (27.08%) had basic education respectively. 45 (18.75%) of the respondents had secondary education, 13 (5.42%) had Diploma and 7 (2.92%) had Bachelor Certificates respectively. 5 (2.08%) of the respondents also had post graduate education.

4.4 Challenges to Shea Butter Processing

The objective of the study is to examine the challenges confronting women into shea butter processing in Sagnarigu Municipalityin the Northern Region of Ghana. The challenges are grouped into financial capital challenge, social capital challenge, human capital challenge, physical capital challenge and natural capital challenge based on the literarute. The study computed mean for each response where mean range of 1.00-1.49 represents strongly disagree; 1.50-2.49 represents disagree; 2.50-3.49 represents neutral; 3.50-4.49 represents agree and 4-50-5.00 represents strongly agree.

4.4.1 Financial Capital as a Challenge

Financial capital challenges focused on start-up capital and access to credit and the responses on each are summarized in Table 7.

Table 7. Financial Capital Challenges

Statement	SD	D	N	A	SA	MEAN	STD	Rank
Start-up capital	12 (5%)	31 (5.42%)	16 (6.67%)	89 (37.08%)	92 (38.33%)	3.9083	1.18918	1st
Credit for equipment, raw material and labor	15 (6.25%)	39 (16.25%)	13 (5.42%)	78 (32.5%)	95 39.58%)	3.8292	1.28068	2nd

Source: Field Data (2021)

The results in Table 7 indicate that 12 (5%) of the respondents strongly disagreed and 31 (5.42%) disagreed that start up support was a challenge that impede their businesses and livelihoods. On the other hand, 16 (6.67%) of the respondents were neutral, 89 (37.08%) agreed and 92 (38.33%) strongly agreed that start up support was a challenge that impedes their business and livelihoods (M=3.9083; std=1.18918).

Table 7 further shows that 13 (5.42%) of the respondents were neutral, 78 (32.5%) agreed and 95 (39.58%) strongly agreed that credit for equipment, raw material and labor was a challenge that impede their businesses and livelihoods. On the contrary, 15 (6.25%) strongly disagreed and 39 (16.25%) disagreed respectively that credit for equipment, raw material and labor was a challenge that impede their businesses and livelihoods. Most of the respondents agreed that credit for equipment, raw material and labor was a challenge that impedes their business and livelihoods (M=3.8292; std= 1.28068).

Between start-up capital and access to credit, start-up capital was ranked first. This implies that start-up capital through personal savings was the major financial challenge to the women regarding their engagement in shea butter processing. Financial capital relates to households' access to money, which may be through savings or credit (Nutakor et al, 2014). The study showed that most of the respondents were willing to invest in their business but their major constraint was access to credit. According to Nutakor (2014), the nature of farming and its attendant natural and logistical risks is the major reason why processing firms have limited

access to credit. For instance, they possess little knowledge on schemes relating to small and medium enterprises financing. Also, most processing firms have very little knowledge about financial opportunities that exist beyond their immediate environment. According to Mensah (2004), the single most important factor that acts as a constraint to the growth of SMEs is the lack of finance and this is due to factors such as relatively undeveloped financial sector with low levels of intermediation, lack of institutional and legal structures that facilitate the management of lending risk, the high cost of borrowing and the rigid nature of interest rates.

4.4.2 Social Capital as a Challenge

Social capital challenges comprise of group dynamics, conflict on transparency and accountability, gender conflict and social status conflict and the responses on each are shown in Table 8

Table 8. Social Capital as a Challenge

Statements	SD	D	N	A	SA	MEAN	STD	Rank
Group dynamics	31 (12.92%)	37 (15.42%)	47 (19.58%)	42 (17.5%)	101 (42.08%)	3.4542	1.42526	5th
Leadership	15 (6.25%)	38 (15.83%)	26 (10.83%)	83 (34.58%)	78 (32.5%)	3.7125	1.24619	2nd
Conflicts on transparency and accountability	9 (3.75%)	15 (6.25%)	37 (15.42%)	65 (27.08%)	114 (47.5%)	4.1833	1.04287	1st
Gender	39 (16.25%)	47 (19.58%)	15 (6.25%)	35 (14.58%)	104 (43.34%)	3.4917	1.57913	3rd
Social status	41 (17.08%)	44 (18.33%)	13 (5.42%)	29 (12.08%)	113 (47.08%)	3.5417	1.61269	4th

Source: Field Data (2021)

The results in Table 8 indicate that 31 (12.92%) strongly disagreed and 37 (15.42%) of the respondents disagreed that the dynamics of their groups do not favor their business and livelihoods. On the other hand, 47 (19.58%) of the respondents were neutral, 42 (17.5%) agreed and 101 (42.08%) strongly agreed that dynamics of their groups doesn't favor their businesses and livelihood. Most of the respondents agreed that dynamics of their groups doesn't favor their businesses and livelihood (M=3.4542; std=1.42526).

Table 8 further shows that 15 (6.25%) of the respondents strongly disagreed and 38 (15.83%) disagreed respectively that the lack of quality of leadership among the association does not help improve their business and livelihood. On the contrary, 26 (10.83%) of the respondents were neutral, 83 (34.58%) agreed and 78 (32.5%) strongly agreed that lack of quality of leadership among the association does not help improve their business and livelihood. Majority of the respondents agreed that lack of quality of leadership among the association does not help improve their business and livelihood (M=3.7125; Std=1.24619).

It is also shown in Table 8 that 9 (3.75%) strongly disagreed and 15 (6.25%) disagreed that conflicts on transparency and accountability does not help enhance their business performance and livelihood. However, 37 (15.42%) were neutral, 65 (27.08%) agreed and 114 (47.5%) strongly agreed that conflicts on transparency and accountability does not help enhance their business performance and livelihood. Most of the respondents agreed that conflicts on transparency and accountability does not help enhance their business performance and livelihood (M=4.1833; std=1.04287).

It is again indicated in Table 8 that 39 (16.25%) strongly disagreed and 104 (43.34%) disagreed respectively that the gender of the women processors deters the improvement of their businesses and livelihood. However, 15 (6.25%) were neutral, 35 (14.58%) agreed and 47 (19.58%) strongly agreed respectively that the gender of the women processors deters the improvement of their businesses and livelihood.

From Table 8, 13 (5.42%) were neutral, 29 (12.08%) agreed and 113 (47.08%) strongly agreed that the social status of the women processors does not help enhance their business performance and livelihood in the community. On the contrary, 41 (17.08%) strongly disagreed and 44 (18.33%) disagreed respectively social status of the women processors does not help enhance their business performance and livelihood in the community. Majority of the respondents agreed that the social status of the women processors does not help enhance their business performance and livelihood in the community (M=3.5417; std=1.61269).

The results in Table 8 show that conflict of transparency and accountability was the major social challenge, followed by leadership challenge, gender conflict, social status challenge and then group dynamic challenge. Social capital refers to attitude towards reciprocity within the community, between households or individuals, based on the confidence formed through social links (Ellis, 2014). The results prove that most of the respondents were of the belief that members of the various associations they joined absented themselves from meetings and also from work but they were interested only in the expected benefits that were accrued. As such, the women processors can be said to be socially incoherent. The family can be more effective in sustaining livelihoods when the members are socially cohesive.

4.4.3 Human Capital Challenge

Human capital challenges comprise of inadequate training, technical skills, technical support, information asymmetry, level of education, poor management skills and poor record keeping. A summary of the responses gathered is shown in Table 9.

Table 9. Human Capital Challenges

Statements	SD	D	N	A	SA	MEAN	STD	Rank
Inadequate training	46 (19.17%)	39 (16.25%)	14 (5.83%)	65 (27.08%)	76 (31.67%)	3.3542	1.52921	6th
Technical skills	0	21 (8.75%)	15 (6.25%)	43 (17.92%)	161 (67.08%)	4.4333	.94832	1st
Technical supporting	2 (0.8%)	31 (12.92%)	17 (7.08%)	56 (23.33%)	134 (55.83%)	4.2042	1.08816	2nd

skills								
Information asymmetry	53 (22.08%)	42 (17.5%)	29 (12.08%)	32 (13.33%)	84 (35.0%)	3.2167	1.59855	7th
Level of education	14 (5.83%)	19 (7.92%)	5 (2.08%)	71 (29.58%)	131 (54.58%)	4.1917	1.17360	3rd
Poor management skills	29 (12.08%)	49 (20.42%)	23 (9.58%)	45 (18.75%)	94 (39.17%)	3.5250	1.47482	5th
Poor record keeping	12 (5.0%)	46 (19.17%)	18 (7.5%)	85 (35.42%)	79 (32.92%)	3.7208	1.24473	4th

Source: Field Data (2021)

The results as shown in Table 9 shows that 14 (5.83%) were neutral, 65 (27.08%) agreed and 76 (31.67%) strongly agreed respectively that inadequate training of women processors reduce performance of their businesses and so affects their livelihood. On the contrary, 46 (19.17%) of the respondents strongly disagreed and 39 (16.25%) disagreed respectively that inadequate training of women processors reduces performance of their businesses and so affects their livelihood. Most of the respondents were neutral that inadequate training of women processors reduces performance of their businesses and so affects their livelihood (M=3.3542; std=1.52921).

Table 9 shows that 15 (6.25%) were neutral, 43 (17.92%) of the respondents agreed and 161 (67.08%) strongly agreed respectively that technical skills among the women was a challenge that affects their businesses and livelihoods. However, 21 (8.75%) of the respondents disagreed that technical skills among the women was a challenge that affects their businesses and livelihoods. Majority of the respondents agreed that technical skills among the women was a challenge that affects their businesses and livelihoods (M=4.4333; std=0.94832). It is again shown in Table 9 that 2 (0.8%) of the respondents strongly disagreed and 31 (12.92%) disagreed that technical supporting skills was a challenge that affects their businesses and livelihoods. Also, 17 (7.08%) of the respondents were neutral, 56 (23.33%) agreed and 134 (55.83%) strongly agreed that technical supporting skills was a challenge that affects their businesses and livelihoods. Most of the respondents agreed that technical supporting skills was a challenge that affects their businesses and livelihoods (M=4.2042; std=1.08816).

It is again shown in Table 9 that 29 (12.08%) were neutral, 32 (13.33%) agreed and 84 (35.0%) strongly agreed that the information asymmetry was a challenge hindering the growth of their business and enhancement of their livelihood. On the contrary, 53 (22.08%) strongly disagreed and 42 (17.5%) disagreed that information asymmetry was a challenge hindering the growth of their business and enhancement of their livelihood. Most of the respondents agreed that information asymmetry was a challenge hindering the growth of their business and enhancement of their livelihood (M=3.2167; std=1.59855). The results as portrayed in Table 9 clearly shows again that 14 (5.83%) of the respondents strongly disagreed and 19 (7.92%) disagreed that their level of education was a challenge that hindered the rate of growth of their business. However, 5 (2.08%) were neutral, 71 (29.58%)

agreed and 131 (54.58%) strongly agreed that their level of education was a challenge that hindered the rate of growth of their business. Majority of the respondents agreed that their level of education was a challenge that hindered the rate of growth of their business (M=4.1917; std=1.17360).

Again, Table 9 further shows that 23 (9.58%) of the respondents were neutral, 45 (18.75%) agreed and 94 (39.17%) strongly agreed respectively that poor management skills among the women processors is a major challenge that impeded the growth of their businesses and their livelihood. 29 (12.08%) of the respondents strongly disagreed and 49 (20.42%) disagreed respectively that poor management skills among the women processors is a major challenge that impeded the growth of their businesses and their livelihood. Most of the respondents agreed that poor management skills among the women processors is a major challenge that impeded the growth of their businesses and their livelihood (M=3.5250; std=1.47482). Table 9 again shows that 18 (7.5%) were neutral, 85 (35.42%) agreed, 79 (32.92%) strongly agreed that poor records keeping is a major challenge that impeded the growth of their businesses and their livelihood. Also, 12 (5.0%) of the respondents strongly disagreed and 46 (19.17%) disagreed that poor records keeping is a major challenge that impeded the growth of their businesses and their livelihood. Majority of the respondents agreed that poor records keeping is a major challenge that impeded the growth of their businesses and their livelihood (M=3.7208; std=1.24473).

Human capital relates to the ability to work and the labor capacity of a family unit or individual. The study found that low education level is a factor that restraints the respondents from fully exploiting their human capital potential. This result is consistent with observation by Nutankor et al. 2014 that there is a general knowledge that there are low levels of education in the rural areas and this has placed them in a disadvantageous position in accessing and taking advantage of other forms of capital. The result also agrees with Mensah (2004) that small scale actors seem to be unaware of or unresponsive to, among others, the need to acquire or seek support for technical services like accounting management, marketing, strategy development and establishment of business linkages. management and support services are thought to be cost preventive and non-value adding.

4.4.4 Physical Capital as a Challenge

Physical challenges comprise of poor road network, poor infrastructure, inadequate storage facilities and insufficient equipment and the responses on each is summarized in Table 10.

Table 10. Physical Capital Challenges

Statements	SD	D	N	A	SA	Mean	Std	Rank
Poor road network	12 (5.0%)	15 (6.25%)	16 (6.67%)	67 (27.92%)	130 (54.17%)	4.2000	1.12856	2nd
Poor market infrastructure	51 (21.25%)	49 (20.42%)	23 (9.58%)	47 (19.58%)	70 (29.17%)	3.1500	1.55054	4th
Inadequate shelter and storage	16 (6.67%)	28 (11.67%)	12 (5.0%)	78 (32.5%)	106 (44.17%)	3.9583	0.90924	3rd

facilities

Insufficient equipment	0	15 (6.25%)	29 (12.08%)	67 (27.92%)	129 (53.75%)	4.2917	1.10217	1st

Source: Field Data (2021)

The results as shown in Table 10 shows that 12 (5.0%) of the respondents strongly disagreed and 15 (6.25%) disagreed that poor road network in the Municipality inhibited the growth of their business. On the other hand, 16 (6.67%) of the respondents were neutral, 67 (27.92%) agreed and 130 (54.17%) strongly agreed that poor road network in the Municipality inhibited the growth of their business. Most of the respondents agreed that poor road network in the Municipality inhibited the growth of their business (M=4.2000; std=1.12856).

Table 10 also shows that 51 (21.25%) of the respondents strongly disagreed and 49 (20.42%) disagreed that poor market infrastructure of their products impeded their business growth and livelihood. On the other hand, 23 (9.58%) were neutral, 47 (19.58%) of the respondents agreed and 70 (29.17%) strongly agreed that poor market infrastructure impeded their business growth and livelihood. Most of the respondents were neutral that poor market infrastructure impeded their business growth and livelihood (M=3.1500; std=1.55054). It is also shown in Table 10 that 16 (6.67%) strongly disagreed and 28 (11.67%) disagreed that inadequate storage and shelter facilities was a challenge that affected their business. Contrarily, 12 (5.0%) were neutral, 78 (32.5%) agreed and 106 (44.17%) strongly agreed that inadequate storage and shelter facilities was a challenge that affected their business. Majority of the respondents agreed that inadequate storage and shelter facilities was a challenge that affected their business (M=3.9583; std=0.90924).

Again, Table 10 reveals that 29 (12.08%) of the respondents were neutral, 67 (27.92%) agreed and 129 (53.75%) strongly agreed that inadequate equipment was a challenge that impeded their business. However, 15 (6.5%) disagreed that inadequate equipment was a challenge that impeded their business. Majority of the respondents agreed that inadequate equipment was a challenge that impeded their business (M=4.2917; std=1.10217).

From Table 10, the major physical capital challenge was insufficient equipment and this was followed by poor road network, inadequate storage facilities and poor infrastructure. The roads, market, transport, storage and equipment are important assets that the respondents complained about the most. The poor nature of roads has led to the perception of smaller market for the products in the community the women processors are in. The local markets are perceived to be larger market oriented if they are to be sold in larger quantities as a result of the poor nature of the road (Nutakor et al, 2014). Adequate shelter for equipment and the shea butter and are issues that hinder the growth of the shea butter processing and the lack of skills for repair and maintenance of equipment are also issues that impede the growth of the women processors.

4.4.5 Natural Capital Challenges

Natural capital challenge has only one item and that was difficult access to land for shea

butter processing and the response on it is shown in Table 11.

Table 11. Natural Capital Challenges

Statement	SD	D	N	A	SA	Mean	Std dev
Land access difficulty and conflict	9 (3.75%)	15 (6.25%)	37 (15.42%)	65 (27.08%)	114 (47.5%)	4.0833	1.10217

Source: field Data (2021)

The results as shown in Table 11 shows clearly that 9 (3.75%) strongly disagreed and 15 (6.25%) disagreed that difficulty in access and conflict of land deter the expansion and improvement of their business and livelihood. On the other hand, 37 (15.42%) of the respondents were neutral, 65 (27.08%) agreed and 114 (47.5%) strongly agreed that difficulty in access and conflict of land deter the expansion and improvement of their business and livelihood. Majority of the respondents agreed that difficulty in access and conflict of land deter the expansion and improvement of their business and livelihood (M=4.0833; std=1.10217).

4.4.6 Institutional Challenges

Institutional challenges focused on market structure and forces, poor community and governmental relationship, government institutional dynamics, and lack of laws to enhance shea butter processing and the responses on each are given in Table 12.

Table 12. Institutional Challenges

Statements	**SD**	**D**	**N**	**A**	**SA**	**Mean**	**Std dev**	**Rank**
Market structure and forces	21 (8.75%)	31 (12.92%)	28 (11.67%)	64 (26.67%)	96 (40.0%)	3.37625	1.33109	1st
Poor community and governmental relationship	45 (18.75%)	49 (20.42%)	31 (12.92%)	51 (21.25%)	64 (26.67%)	3.1667	1.48821	3rd
Government institutional dynamics	35 (14.58%)	48 (20.0%)	41 (17.08%)	49 (20.42%)	67 (27.92%)	3.2458	1.40605	2nd
Lack of laws and services that enhance production processes	43 (17.92%)	49 (20.42%)	39 (16.25%)	48 (20.0%)	61 (25.42%)	3.1458	1.45777	4th

Source: Field Data (2021)

Table 12 shows that 21 (8.75%) strongly disagreed and 31 (12.92%) disagreed that market structure and forces do not favor the growth of their businesses and livelihood. Also, 28

(11.67%) of the respondents were neutral, 64 (26.67%) agreed, 96 (40.0%) strongly agreed that market structure and forces do not favor the growth of their businesses and livelihood. Majority of the respondents were neutral that market structure and forces do not favor the growth of their businesses and livelihood (M=3.37625; std=1.33109).

The results as shown in Table 12 shows that 45 (18.75%) strongly disagreed and 49 (20.42%) disagreed that poor community and governmental relationship is a challenge that affects the growth of their businesses and livelihood. On the contrary, 31 (12.92%) of the respondents were neutral, 51 (21.25%) agreed and 64 (26.67%) strongly agreed that poor community and governmental relationship is a challenge that affects the growth of their businesses and livelihood. Most of the respondents were neutral that poor community and governmental relationship is a challenge that affects the growth of their businesses and livelihood (M=3.1667; std=1.48821).

It is also shown in Table 12 that 41 (17.08%) were neutral, 49 (20.42%) agreed and 67 (27.92%) strongly agreed that governmental institutional dynamics is a challenge that affects the growth of their businesses and livelihood. However, 35 (14.58%) strongly disagreed and 48 (20.0%) of the respondents disagreed respectively that governmental institutional dynamics is a challenge that affects the growth of their businesses and livelihood. Most of the respondents were neutral that governmental institutional dynamics is a challenge that affects the growth of their businesses and livelihood (M=3.2458; std=1.40605).

Table 12 again shows that 43 (17.92%) of the respondents strongly disagreed and 49 (20.42%) disagreed respectively that the lack of laws and services that enhance production processes is a challenge that affects the growth of their businesses and livelihood. However, 39 (16.25%) of the respondents were neutral, 48 (20.0%) agreed and 61 (25.42%) strongly agreed that the lack of laws and services that enhance production processes is a challenge that affects the growth of their businesses and livelihood. Majority of the respondents were neutral that the lack of laws and services that enhance production processes is a challenge that affects the growth of their businesses and livelihood (M=3.1458; std=1.45777).

4.6 Extent to Which Shea Butter Processing Challenges Undermine Sustainable Livelihood of Women

This section looks at research objective three "Extent to which Shea butter processing undermines the sustainable livelihood of women". This section is very important as it helps to identify which of the identified challenges significantly undermine sustainable livelihood of women. The study employed Structural Equation Model (SEM) to determine the magnitude of effect of each shea butter processing challenges (financial capital challenges, social capital challenges, physical capital challenges, human capital challenges, natural capital challenges and institutional capital challenges) on sustainable livelihood of women. The study employed principal composite analysis to construct composite index for each of variables and the results of SEM is shown in Figure 2 and Table 13.

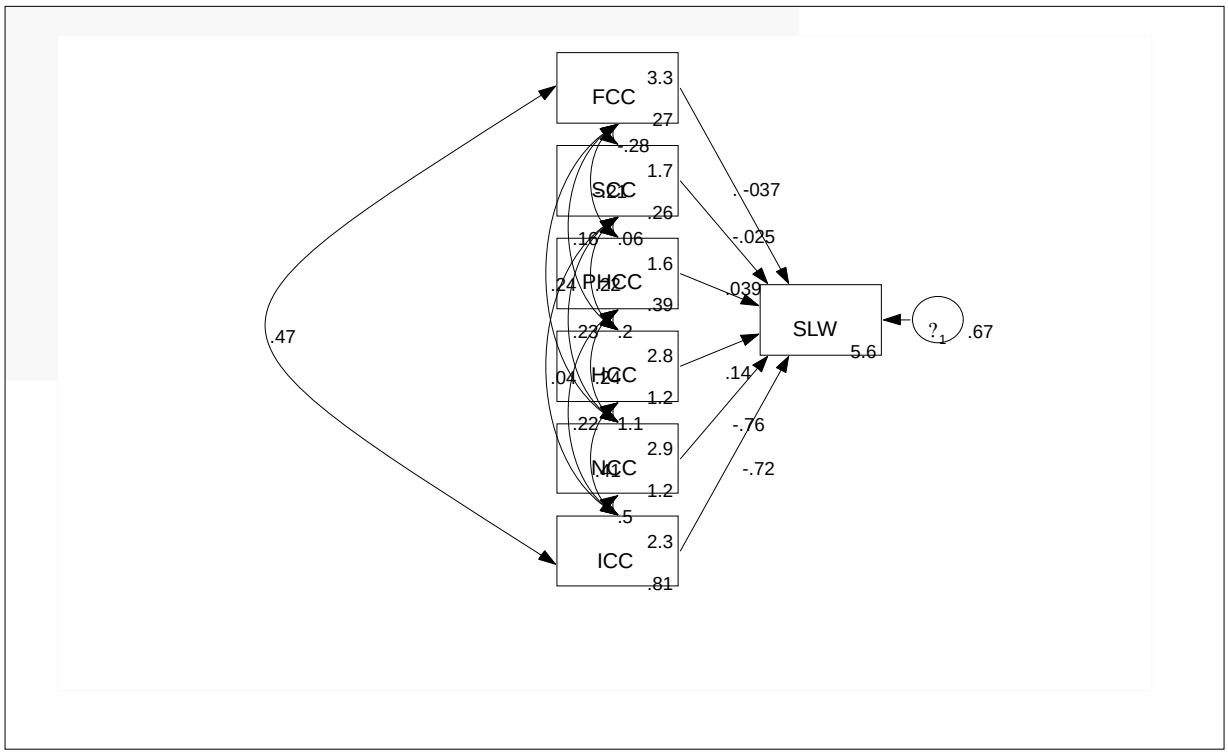

Figure 2. Structural Equation Model Diagram

Table 13. Structural Equation Model

Variables	Coeff.	OIMStd Err	Z	p>/z/	95% Conf. Interval	
Financial capital challenges (FCC)	-0.0367386	0.0199069	-1.97	0.035	-0.0022782	0.0757555
Social capital challenges (SCC)	-0.02529	0.2234414	-0.11	0.910	-0.463227	0.412647
Physical capital challenges (PHCC)	0.0388632	0.1805088	0.22	0.830	-0.3149275	0.3926538
Human capital challenges (HCC)	0.143429	0.2266365	0.63	0.527	-0.3007703	0.5876283
Natural capital challenges (NCC)	-07550794	0.2465647	-3.06	0.002	-1.238337	-0.2718214
Institutional capital challenges (ICC)	-0.7185015	0.1380816	-5.20	0.000	-0.9891366	-0.4478665
Constant	5.648679	0.4402241	12.83	0.000	4.785856	6.511503
F-stats (Chi-sq_obs (6)	71.865					
p-value	0.000					

Source: Field Data (2021)

From the Structural Equation Model three of the six challenges (financial capital challenges, natural capital challenges and institutional challenges) were identified to significantly undermine the sustainable livelihood of women into shea butter processing. Among the three significant challenges, institutional challenges had the highest significant impact, followed by natural capital challenges and then financial capital challenges.

4.7 Conclusions and Recommendations

The study concludes based on the findings that women into shea butter processing in the Sagnerigu Municipality were confronted with several challenges such as financial challenges, human capital challenges, social capital challenges, natural capital challenges, physical capital challenges and institutional challenges. However, not all these challenges significantly undermine sustainable livelihood of women involved in shea butter processing in the study area. Only natural capital challenges, institutional challenges and financial challenges significantly undermine sustainable livelihood of women into shea butter processing. This study makes key recommendations based on the findings to improve sustainable livelihood of women into shea butter processing in Sagnerigu Municipality in Northern Ghana. The study recommends that access to finance must be made simple for women in shea butter processing and the need for modern equipment must be catered for in order to boost their businesses and improve their livelihood. Given the relatively vulnerable state of the rural processors, the request for collateral securities by financial institutions before issuing credit to them may be very costly. There must be alternative means of getting affordable credit; such as credit schemes by Government through its agencies like MASLOC to help the women processors. The Government of Ghana through the Sagnerigu Municipal Assembly should help address all the institutional challenges confronting the women into shea butter processing. The assembly should establish formal collaboration with the women through which the assembly can extend technical and financial support to them. The Government of Ghana through Sagnerigu Municipal Assembly should regulate the activities and operations of shea butter processing in the area. The regulation will help make shea butter processing a formal business with legal backing which will help facilitate sponsorship from many non-governmental organizations and other business partners of Government to shea butter processing. The Government of Ghana through the assembly should adopt shea butter processing into the one-Municipality-one factory project to help make it more formal to increase job creation for women in particular for improved sustainable livelihood.

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Competing interest

Authors declare no competing interest

Conflict of Interest

Authors declare no conflict of interest

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