

Contribution of Shea-Based Livelihoods to Income of Rural Women in North-Western Ghana

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Abstract

The shea industry is a self-contained industry, and it is argued that with critical investment in processing machinery and skill training of the primary actors, it can sustainably enhance the livelihoods of poor rural households. Following an investment in semi-mechanised shea butter processing projects in two communities in North-Western Ghana, this study examined the contribution of the projects to rural women's income in the communities. Data were collected from 156 shea butter producers, using questionnaires, two key informant interviews and two focus group discussions with the executives of the producer associations. The study found that although farming is the main occupation of the majority of women, shea butter processing is the leading sector because it contributes relatively higher to women's income. Intriguingly, the income from shea-based livelihood is higher than the minimum annual wage in Ghana. This implies that the shea sector has the potential of contributing to household income, just as the formal sector. In order to enhance the role of the sector towards livelihoods, continuous support to the primary actors (women), and the ability to link them to external market remain critical.

Key Words: *Rural women, income, semi-mechanised, shea butter processing, Ghana*

Introduction

Globally, there is an increasing demand for shea products (sheanuts and sheabutter) due to their economic and medicinal value and thus contributes to women's income (Hatskevich et al., 2011; Nguekeng et al., 2021). The shea sector is dominated by women and it is estimated that about 16 million women, half of them in West Africa, work in shea-related activities (Nguekeng et al., 2021). In Ghana, earnings from sheabutter products in 2015 reached US\$64 million, a 23 percent growth from US\$52 million in 2014; while in Burkina Faso, the sector contributed CFA 10 billion (US\$17 million) through nut sales in 2012 (Rousseau et al., 2015). In 2020, the Global Shea Alliance revealed that 4 million women are

involved in the export value chain, with US\$200 million generated as yearly income from shea products to producing communities (Nguekeng et al., 2021).

It has been established, however, that despite the significance of shea products to national economies, the traditional methods of collecting sheanuts and processing sheabutter do not meet international market standards both in terms of quality and quantity. The concerns about the efficiency of the traditional mode of producing sheabutter from the shea kernel has led to calls for mechanisation of sheabutter processing through the adoption of improved technology to improve quality and increase the quantity (Bello-Bravo et al., 2015; Wardell & Fold, 2013). The call is necessary because studies have projected the existence of high potential within the shea industry for livelihoods enhancement (Bello-Bravo et al., 2015; Kent et al., 2014; Reynolds, 2010; Wardell & Fold, 2013). It would provide an important source of income to households and a means for livelihoods diversification to reduce households' vulnerability to food insecurity and climate variability (Elias & Carney, 2007; Pouliot, 2012). It is therefore argued that with critical investment in processing machinery and skill training of the primary actors, the industry can easily scale up (Reynolds, 2010).

In rural areas, semi-mechanised technology is seen as a viable method of sheabutter processing since rural areas are not technologically advanced to merit a fully mechanised system (of sheabutter processing). Semi-mechanised equipment, including nuts crushers, roasters, millers, and kneaders, have been introduced over the years to complement the traditional/manual process and also help in minimising the labour and time requirement that have been associated with the traditional method of butter processing. As a result, the majority of women who mostly work in groups/cooperative have received various equipment to enhance sheabutter processing (Kent et al., 2014). These efforts are geared towards improving income and reducing poverty of rural households.

The Upper West Region is noted for the production of sheabutter for both domestic and commercial purposes. However, it has been established that the Region where shea is predominant, has the highest incidence of poverty (70.9 percent), with the worse affected being rural areas, and particularly women and households headed by women (Ghana Statistical Service, 2018). This raises questions about the role of the shea sector in livelihoods improvement in rural areas, particularly, as regards the income of women. This study sought to understand current contribution of semi-mechanised methods of sheabutter extraction to the income levels of rural women. The rest of the paper presents the contribution of sheabutter to livelihoods empowerment of women; the concept of livelihood empowerment of women; the study context; the study design; the results and the discussion.

Contribution of Shea to Livelihood Empowerment of Women

The shea tree plays a key role in promoting rural livelihoods, serving as one of Ghana's economic natural resources that could be exploited and used as a tool for substantial poverty reduction and socioeconomic development (Kodua et al., 2018). In the Sahel Region where the shea trees grow, the maturation period for the fruits falls within a period of food insecurity hence, the sweet fruit pulp is usually consumed as food and the sheabutter serves as cooking oil to complement household food needs (Bup et al., 2014). Shea is an important household resource that provides a valuable source of income to female households and a

means for livelihood diversification to reduce their vulnerability to food insecurity and climate variability (Elias & Carney, 2007; Pouliot, 2012).

A study in Burkina Faso revealed that collecting and processing sheanuts and kernels contributed to as much as 12 percent of total household income of the poorest households and 7 percent of total household income of the well-off households (Pouliot & Treue, 2013). Recently, commercialisation of shea products contributed about 66 percent to household income in Burkina Faso while in Cote d'Ivoire, a sheabutter producer earned between US\$156 and US\$183 in the shea season (Nguekeng et al., 2021). In Northern Ghana, the shea tree is economically important as it provides wide range of products and services to rural households during the lean season (when cultivation begins and food stocks are low); thus, it serves as a ready source of income for rural households (Kombiok & Agbenyega, 2017; Laube, 2015). A study conducted in the Bole District in Ghana found that shea contributed between 8 and 25 percent of women's income (Ingram et al., 2016). Therefore, sheanuts and butter function as forms of natural insurance against low farm yield and other income shortfalls (Nguekeng et al., 2021; Pouliot & Treue, 2013).

Concept of Livelihood Empowerment of Women

There are varied interpretations of livelihood (Bryceson, 1996; Chambers & Conway, 1992); but Bryceson's definition best suits the scope of this work. He defines livelihoods as encompassing income, both cash and in kind, as well as the social institutions (kin, family, compound, village), gender relations, and property rights required to support and sustain a given standard of living (Bryceson, 1996). Individuals possess various resources or livelihood assets (human, social, natural, physical and financial capital) that they use to achieve their goals (Speranza et al., 2014). The assets bundle as in the amount, diversity and balance between assets, positively influences individual livelihoods strategies. However, De Haan and Zoomers (2005) argued that a source of livelihoods is a matter of ownership and flow of information, the management of skills and relationships, and the affirmation of personal impact and group identity. Taking cognizance of the varied views expressed in the literature, livelihoods, therefore, are the means, activities and entitlements by which people make a living. In most instances, resources found within one's immediate environment provide livelihoods or the means of making a living. It is common to have coastal areas inclining more towards fishing as a major source of livelihood while those in the forest belts and northern zones usually engage in farming as a source of livelihood. Similarly, in the semi-arid regions of West Africa where shea trees are predominant, the shea sector serves as a major livelihood, contributing significantly to households and national economies (Bup et al., 2014; Wardell & Fold, 2013).

Similar to livelihoods empowerment has received varied interpretations. Yet empowerment remains a 'latent phenomenon' that is not directly observable (Mahmud et al., 2012). Batliwala observes that at the local level, empowerment is on occasion, perceived to mean, 'welfare, upliftment, community participation and poverty alleviation' (Batliwala, 1994, p. 127). Empowerment is closely associated with agency, the reflexive feeling of control over actions and their consequences (Kabbeer, 2012). Thus, empowerment refers to a process (means to achieve), as well as an outcome (an end). It also involves (external agencies) facilitating the processes to enable the setting of the agenda, the acquisition of skills and the fostering of independence by women themselves. Empowerment is a, "process occurring in each woman's life and also a process occurring over time in a society" (Mahmud

et al., 2012, p. 618). As a dynamic process of change, the effects of empowerment might be visible but the internal dynamism is difficult to examine (Kabeer, 1999; Mahmud et al., 2012). For instance, a woman's ability to exercise choice might only be observed to a particular point because there are usually motivational and purposive factors behind choices that are not evident (Mahmud et al., 2012). In conceptualising empowerment, two key elements emerged: the first element is Agency - the ability to define one's goals and act upon them or the ability to gain control over various aspects of one's life (Kabeer, 1999; Kishor & Gupta, 2004). The second element is, "access to and control over resources (material, human and social) that women require from the multitude of relationships in the various domains of the family, market and community" (Mahmud et al., 2012, p. 611).

Women empowerment is thus about critically raising the consciousness of women. This measures the degree to which women experience an increase in self-worth and a decline in acceptance of lower status of women relative to men at home and in the community (Mahmud et al., 2012). This was evident in Sierra Leone where Cornish et al. (2021), found that men in rural areas are happy to have their wives work to earn money because they will support a better married life, and promote good health and cleanliness in the community. As a result, instrumentalist development projects that aim at alleviating poverty in poor communities such as women's income-generating activities and microfinance have also been argued as empowerment endeavours (Batliwala, 1994; Huis et al., 2017; Rajamma, 1993). It is based on this discourse that this study explores the potential of the semi-mechanized sheabutter processing project as a means to empowering rural women in the two districts and the potential to effectively improving women's socio-economic status beyond instrumentalism.

Study Context

The study was carried out in Naro in Nadowli District and Moyiri in the Daffiama-Bussie-Issa District in the Upper West Region of Ghana (Figure 1). These communities were selected because they are into semi-mechanised sheabutter processing for livelihood enhancement. Naro has a population of 2,384 comprising 1,093 (45.8 percent) males and 1,291 (54.2 percent) females with a projection of 2,948 total population for 2020 comprising 1,425 and 1,523 males and females respectively (Nadowli-Kaleo District Assembly, 2018). Moyiri has a population of 894 people, comprising 420 (45 percent) males and 474 (55 percent) females with a projected total population of 1,108 in 2020. Agriculture remains the mainstay of the communities at the subsistence level, employing about 98 percent of the population and the other sectors employing two (2) percent of the population. The vegetation is characterised by shea, rosewood, baobab, mango and dawadawa trees. The shea tree provides a greater source of income to households, particularly women to cater for their household needs. The abundance of this economic tree in the district provides an opportunity for the establishment of sheabutter processing centres in some communities to increase employment opportunities for the people through sheanuts and butter trade. The main alternative livelihood activity for women in the two communities is sheanuts collection and sheabutter processing as well as petty trading and grains stocking.

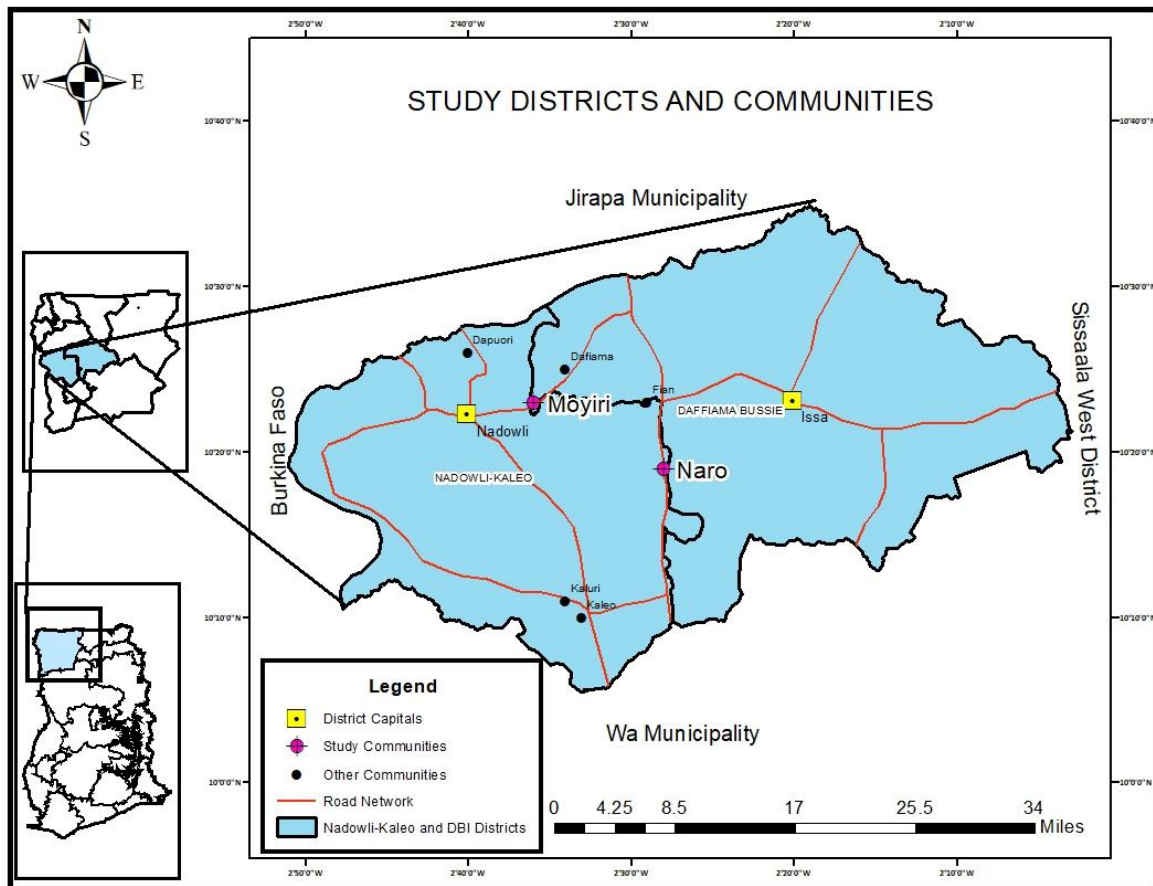


Figure 1: Map of the Study Area in Regional Context

Methodology

The study adopted sequential mixed methods in the collection and analysis of the data. The collection and analysis of the data started with the qualitative phase to understand in reasonable detail, the issues around women in semi-mechanized sheabutter processing in the two districts since knowledge of this subject matter was limited. This was followed by quantitative data collection and analysis to obtain a broader perspective of the issues that emerged from the initial qualitative analysis. The units of analysis in the study were the individual women who were into sheanut picking and sheabutter processing, the women groups in the communities who process sheabutter, and organisations and companies that operate within the shea sector as facilitators in the study area. The selected communities had been noted for sheabutter processing with semi-mechanised equipment and preliminary fieldwork revealed that the shea butter processors' associations in the communities at some point, received equipment for sheabutter processing from private sector actors within the shea value chain. As such, purposively selecting these communities was necessary because they are information-rich on shea business and the expected respondents could provide sufficient information on income from shea butter processing.

The qualitative data was collected using focus group discussions (FGD) with the executives of the sheabutter producer associations in the sampled communities and semi-structured interviews with staff of two NGOs in the shea sector in the two districts. The FGDs held with these participants provided detailed information about content, group operations, the income generated through sheabutter processing, and the impact of the income on the

living standards of households in these communities. One FGD was conducted in each community. Each FGD comprised seven representatives from the associations, including the chairperson, the vice-chairpersons, two secretaries, the treasurer, the organizer and the machine operator. The semi-structured interviews were conducted with one staff each of the Women Integrated Development Organisation (WIDO) and United Purpose. Held on separate dates, each FGD and interview lasted for about one and a half hours. Focus group discussions and interviews were recorded using digital recorders and then transcribed for analysis. The qualitative data was analysed based on themes (livelihoods options, social benefits of shea business and assets acquisitions using proceeds from shea business). The audio recorded were transcribed and the transcripts were analysed by reading them severally to identify groups of similar responses.

The quantitative data, on the other hand, was collected through a survey of randomly sampled members of the sheabutter producer associations in the two communities, using a semi-structured questionnaire. The sample size was determined using a statistical formula provided by Yamane (1965). The formula is given as:

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

Where, n = sample size, N = population, and e = margin of error.

The preliminary field visits revealed that there were 257 women processors (producers) who produced sheabutter as at April 2020 in the two communities. Using a 95 percent confidence level and 0.05 margin of error; the sample size was calculated as follows:

$n = \frac{257}{1+257(0.05)^2} = 156$. Therefore, the total sample size for the two groups was 156. This total sample was distributed between the two groups proportionally, as shown in Table 1.

Table 1: Sample Size Distribution

Community & Group	Number of Beneficiaries	Proportion	Sample Size	K th
Moyiri (Lambutaalasombu)	154	60%	93	Every 2 nd
Naro (Lanzinlanombu)	103	40%	63	Every 2 nd
Total	257	100%	156	

Source: Fieldwork, 2020.

The quantitative data collected include the types of secondary livelihood sources engaged in by the producers, the income level of the sheabutter producers, and the sheabutter production levels (kilograms) of producers. The production and income levels of the two communities were obtained from the production records of the Associations. Although 156 producers were surveyed, the production levels and incomes were not limited to the surveyed producers. We used the total number of producers in both communities for the income and production analysis. There were 109 and 132 producers in Naro in 2018 and 2019 respectively. In Moyiri, there were 129 and 160 producers in 2018 and 2019 respectively. The use of records of all producers was necessary because of the need to get comprehensive production and income levels and to further avoid biases (sampling) in the income and production reportage. The study did not consider the income received from other sources other than sheabutter production. Given the difficulty in getting accurate information on the income and expenditure of individuals and households in the informal sector, especially in developing countries (Aromolaran, 2004; Domapielle, 2021), this study

was limited to individual producers' income records that have been documented by the groups.

The selection of respondents was done using systematic sampling and to select the respondents for the survey, the researchers used the membership list of each producer group as obtained from the Association's executives. Based on the number of women producers and the required sample size, the first name was picked randomly and then every second (2nd) name on the list was also picked. This was done until the required sample size was obtained in each community. The researchers then used the chosen names on the list to trace the producers to be interviewed. Identification of selected members (producers) was not difficult because all the women in the associations are familiar with themselves. The data obtained from the processors' questionnaires were analysed using Statistical Package for Social Sciences (SPSS) and Excel.

Results

Background of Naro and Moyiri Women Associations

The official name of the Association in Naro is "Lanzenlanombu Cooperative Farmers and Marketing Association". "Lanzenlanombo" means being together promotes love. The Association began as a mother-to-mother support group in June 2008 with a membership of 30 women. They aimed at championing reproductive health and promoting healthy childcare and family planning practices in Naro. Following that, the Association started a savings and loans initiative with support from Women Integrated Development Organisation (WIDO), an NGO operating in the area. WIDO subsequently introduced the group to commercial sheabutter processing. Concern Universal, which later became United Purpose, was brought in to play a marketing link to get sheabutter sold. The Association has now grown in membership from 30 to 103 members as at April 2020.

Moyiri shea women Association is called, "Lambutaalasombu Women Association". "Lambutaalasombu" means "we gain support when we are together" (togetherness has support). The Association began as a support-based group that offers communal labour to its members during farming, funerals and other domestic chores such as plastering their buildings, using clay and cow dung. Currently, the Association consists of four Village Savings and Loan Associations (VSLA) groups with an average membership of 30 per group. ProNet North (an NGO) later introduced the group to Concern Universal (an international NGO) which developed interest in supporting the group with a production centre to facilitate sheabutter production and to enable them supply to the external market to improve their income. The Association now operates under the name "Lambutaalasombu" Shea Association with 154 women sheanuts collectors and butter processors. Their main activities include sheabutter processing, the VSLA scheme, and communal labour.

Background of Survey Respondents

The major variables of the background of respondents to be analysed were household size, age, marital status and the level of education attained. Educational level is often used as a determinant of the mode of communication during training and to appreciate the level of assimilation of measuring standards, especially in shea butter production. Household size was examined to indicate the burden that breadwinners bear in their households. Table 2 shows the descriptive statistics of household size and age of respondents in the communities.

Table 2: Household Size and Age of Respondents

Measures	Household Size		Age Structure	
	Moyiri	Naro	Moyiri	Naro
Mean	9.23	9.90	50.31	36.10
Median	9.00	2.00	52.00	38.00
Mode	10	10	60	40
Std Deviation	3.455	3.073	13.473	7.184
Minimum	4	5	23	21
Maximum	18	15	74	50

Source: *Fieldwork, 2020.*

Table 2 shows that the maximum household size was 18, and the minimum household size was 4, and both were found in Moyiri. The mean household size is slightly higher in Naro than in Moyiri. The statistical characteristics of the ages of respondents were analysed to understand the age categories of women that are involved in sheabutter processing. Given that the mode of sheabutter processing is semi-mechanised, the ages of respondents indicate their labour contribution to the sheabutter processing. The maximum age of the respondents was 74 in Moyiri while the maximum age in Naro was 50. It is worth noting that females as young as 21 years are engaged in sheabutter processing as their source of income and livelihoods. There are high variations in the age in Moyiri than in Naro and this is shown by the standard deviation (Table 2). Generally, participants in Moyiri were older than their counterparts in Naro.

In terms of marital status, it was found that 74.4 percent of the respondents in both communities were married, comprising 35.3 percent in Naro and 39.1 percent in Moyiri. Only one respondent (0.6 percent) was single, and 25 percent of the respondents were widowed (19.9 percent in Moyiri and 5.1 percent in Naro). Given that widows are often constrained in their ability to profitable income generating activities (Thomas, 2008), widows in these communities engaging in shea butter business, potentially enhance the livelihood security of their households. All the women household heads in Moyiri were widowed. In Naro, however, none of the respondents was a household head, although some were widows. This is due to the culture of the area where widows stay with their husband's family members and are catered for in those households.

We also analysed the level of education of the respondents. The level of formal education has implications for the extent and speed of training and adoption of new technology for sheabutter processing. Access to information, a general understanding of marketing channels for sheabutter and knowledge dissemination during training sessions is also influenced by the participant's level of education. Table 3 shows the educational attainment of respondents.

Table 3: Education Attainment of Respondents

Educational status	Naro		Moyiri		Total	
	Freq.	%	Freq.	%	Freq.	%
No formal education	41	65.1	75	80.6	116	74.4
Primary Education	6	9.5	3	3.2	9	5.8
Junior Secondary School/Middle school	14	22.2	14	15.1	28	17.9
Vocational/Technical	1	1.6	0	0.0	1	0.6
Senior Secondary School/O'/A'Level	1	1.6	0	0.0	1	0.6
Tertiary (Polytechnic)	0	0.0	1	1.6	1	0.6
Total	63	100	93	100	156	100

Source: Fieldwork, 2020

As observed in Table 3, about 74.4 percent of the respondents have not had any formal education and the proportion is higher in Moyiri, suggesting a low literacy level. As such, training in sheabutter business-related activities is often done using the local language, as was established during the focus group discussion. Only one respondent had tertiary education and she was in Moyiri. According to this producer, she completed Polytechnic and was engaged in the sheabutter business to enable her to raise funds to further her education.

Livelihood Options

The main sources of livelihood of the households of the participants were analysed to ascertain the livelihood options in the study settings. All the participants mentioned farming as their main occupation prior to the implementation of the semi-mechanised sheabutter processing. However, the introduction of semi-mechanised sheabutter processing has changed the main source of livelihood for the women who signed up for the project. In Naro and Moyiri, 95.2 percent and 62.4 percent of the survey respondents respectively, mentioned sheabutter processing as their main source of livelihood. Thus, a relatively higher percentage (37.6 percent) of the respondents in Moyiri still consider farming as their main source of livelihood as compared to 4.8 percent in Naro. Besides the two main livelihood sources, respondents were asked to indicate other sources of livelihood. Figure 2 shows the other sources of livelihood of the respondents aside sheabutter processing and farming.

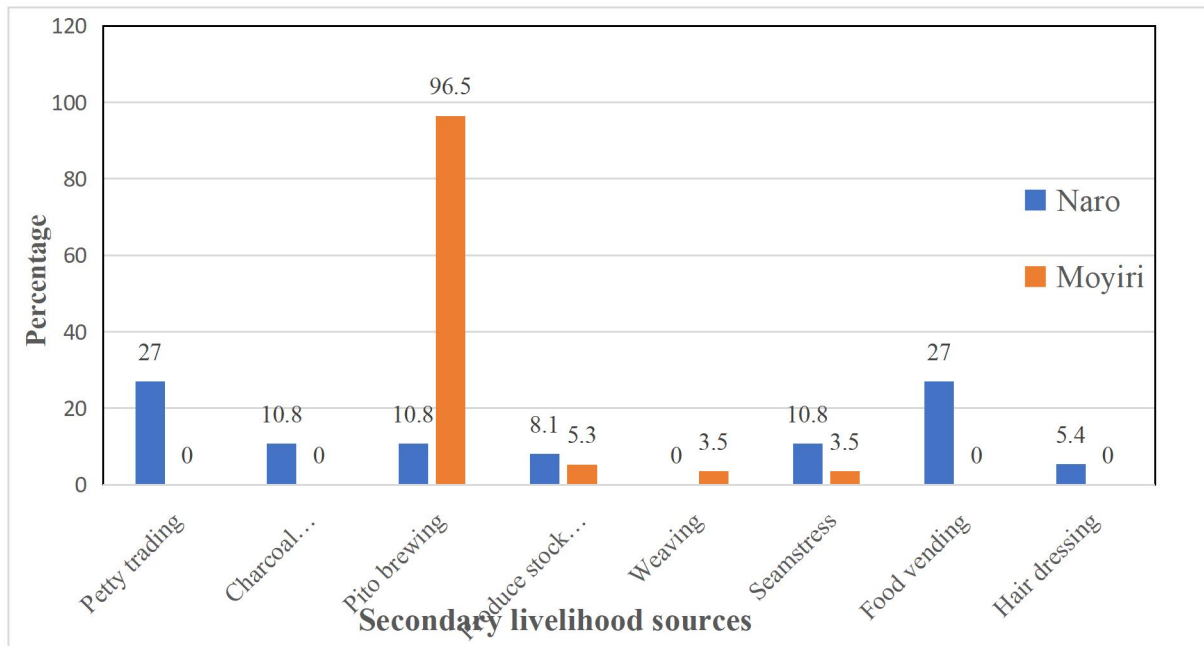


Figure 2: Secondary livelihood sources

Figure 2 shows that respondents have multiple sources of income. About 60.3 percent of the respondents had three sources of livelihoods – farming, sheabutter processing business and one of the activities in Figure 2. As indicated in Figure 2, no respondent in Moyiri was engaged in petty trading, charcoal production, food vending or hair dressing. The focus group discussion and the producer survey revealed that only women in Moyiri were hitherto engaged in charcoal production. The discussion revealed that as the charcoal business became lucrative, men engaged in wood charring for charcoal and the male involvement resulted in the massive felling of shea trees. This, according to the discussants, is because the men are physically strong and could fell many trees at a time. This resulted in the rapid destruction of trees, especially shea trees. Consequently, the elders of the community decided to ban the charring of wood for charcoal within the community catchment area. This ban was to help in conserving the shea trees and promoting sheabutter processing as a key livelihood activity. As shown in Figure 2, the absence of food vending and petty trading in Moyiri was because the community is remote – it is not linked to a major highway/trunk road. As such, setting up such businesses in a small and remote community (Moyiri) would have limited demand since the market would be confined to the community members.

Data in Figure 2 shows that 96.5 percent of the respondents were engaged in brewing pito (local alcoholic beverage) for commercial purposes in Moyiri. According to these women, pito brewing is not a lucrative business because of the limited market. When asked about the reasons behind the limited market, a discussant in the FGD in Moyiri explain that:

“...the market (customers) for pito is limited to the community members and as such, brewing is done on a rotational basis. If many women were allowed to brew simultaneously, there would not be enough demand to match the quantity of pito brewed. Once supply outstrips demand, we would run at a great loss...” (Excerpts from Focus Group Discussion, May 2020).

According to the respondents, although the rotation of pito brewing was to give many women opportunities to brew, it takes six weeks before another person takes her turn to

brew. Pito brewing was not common in Naro because it is a Muslim-dominated community and pito brewing is not permitted among Muslim households.

All the women had the requisite skills to produce sheabutter but were not producing on commercial scale. The skill acquired from their mothers was only used by the women to produce for household consumption and a small percentage of what is produced is sold in neighbouring local markets. This has been the practice until the introduction of the semi-mechanised processing and subsequently the market linkage aspect, which then encouraged them to produce in commercial quantities for the global market. This implies that the women, hitherto, were not producing in commercial quantities due to: the limited market, the labour-intensive nature of the 100 percent manual (man-powered) method of butter extraction and the low quality of butter. These factors limited the ability of the sheabutter business to enhance livelihoods.

Contribution of Sheabutter Business to Producer's Household Income

The study also examined the contribution of the semi-mechanized sheabutter processing intervention to household income. Although the respondents have multiple sources of income, they were required to indicate the source that currently gives them the highest income. All the respondents in Naro indicated that sheabutter processing business was their major source of income. In Moyiri, 95.6 percent of the respondents mentioned that sheabutter processing business was their main source of income while 4.4 percent of the respondents mentioned farming as their main source of income. Table 4 presents the production and income levels of the two communities.

Table 4: Production and Income Levels⁷

Variable (Individual producers)	Naro		Moyiri	
	2018	2019	2018	2019
Mean annual quantity of butter per producer	392.69 kg	369.08 kg	109.34kg	153.17 kg
Standard deviation	287.18 kg	274.97 kg	104.73kg	138.46kg
Maximum annual quantity of butter per producer	1,314 kg	1,111 kg	413kg	807kg
Minimum annual quantity of butter per producer	42kg	22 kg	4 kg	14.5kg
Total for all producers (kg)	42,803 kg	48,349 kg	14105 kg	24,532 kg
Mean annual income per producer	Gh¢1,854.96	Gh¢2,757.59	Gh¢660.79	Gh¢1,195.24
Standard deviation	Gh¢1,368.31	Gh¢2,042.10	Gh¢631.15	Gh¢1,046.27
Minimum annual income per producer	Gh¢252.00	Gh¢176.00	Gh¢18.00	Gh¢112.00
Maximum annual income per producer	Gh¢6,319.50	Gh¢8,439.00	Gh¢2,644.50	Gh¢6,010.00
Total income for all producers	Gh¢202,190.70	Gh¢377,539.72	Gh¢85241.70	Gh¢191,239.00

Source: Field work, 2020.

The mean production level in Naro decreased from 392.69kg to 369.08kg, representing a 6 percent decline. However, the mean income level from sheabutter business increased from Gh¢1,854.96 in 2018 to Gh¢2,757.59 in 2019, representing 46.7 percent increase. The reduction in quantum of production occurred because of the low yield in sheanuts for the 2018/2019 shea season. Despite the decline in the average level of production of sheabutter due to the scarcity of sheanuts, the demand for sheabutter remained high and resulted in price increase, leading to an increase in income of producers. The increase in the income of

⁷ Exchange rate as of April 2020: US\$1.00 = Gh¢5.70.

producers is reflected by the standard deviation of production and income in Table 4. In Moyiri, the analysis of production and income levels showed that the mean annual production increased by 40 percent whereas the mean annual income of producers increased by 72.2 percent between 2018 and 2019. In both communities, the standard deviations in production and income show that there are wide variations in production and earnings among the producers (Table 4).

The difference in production and income is due to differences in capacity, frequency of production and the state of road infrastructure. The FGDs revealed that the producers have different capacities in terms of quantity of raw materials (nuts) and labour availability. Furthermore, some producers recorded small production frequencies (number of productions per year) because of social engagements such as funerals, caring for elders and children and other necessary travels, leading to low level production. The records from the executives in Naro showed that the average number of times of butter processing per producer is 7.8/year in 2019; with the minimum frequency of production as one per year and the maximum frequency of production for a producer was 21 times per year. Therefore, whereas some producers process sheabutter 21 times a year, others process butter once a year. The situation in 2018 was not so different. The average production frequency per producer was 8.1; with a maximum of 20 productions per producer and a minimum of one production per producer in 2018. In 2019, the average frequency of production per producer in Moyiri was 6.7/year; with a maximum of 12 and a minimum of one production per producer in a year.

Thus, participation in social events adversely affects the production of sheabutter and the income of the producers. A focus group discussant in Naro said this about the challenge social events pose to the frequency and production of sheabutter:

“...we cannot use our sheabutter business activities as an excuse not to attend funeral celebrations, especially within the neighbourhood. If one dares, society will frown on the person. This is because funeral rites and celebrations are a central part of our culture where we commiserate with relatives, friends and neighbours. Hence, these social events sometimes happen at the expense of the sheabutter business. We however work harder to cover up the lost production time, emanating from social events...” (Excerpts from Focus Group Discussion, May 2020).

It was further revealed that road networks and conditions played a role in the differences in production levels. Whereas the road linking Naro and Wa (the regional capital) is in very good condition (tarred), Moyiri is located about 10 kilometres off the main highway to Wa. The road linking Moyiri and the tarred road is in bad condition, thus limiting the number of vehicles plying that road. This posed market accessibility challenges to both the sheabutter producers and buyers. This was confirmed by the interview with a staff of Concern Universal who explained that Moyiri has two major challenges in communication: poor road network and condition; and poor telecommunication network connection. These factors make it difficult to easily get access to the community by road and the producers via telephone. The respondent further explained that:

“Moyiri is not along a major highway and as such, it is relatively difficult to access Wa, the regional capital. When the NGO (Concern Universal) receives orders from bulk buyers that require immediate supply, the opportunity is given to Naro because

Moyiri will have challenges bringing the butter to Wa... Besides the poor road condition, Moyiri also has a poor telecommunication network and, as a result, we sometimes call and cannot reach the producers on phone. As a result, Moyiri is at a disadvantage in relation to Naro” (Interview with CU staff, May 2020).

This narrative is consistent with the survey results which show relatively higher levels of production and income for the producers in Naro than in Moyiri between 2018 and 2019 (Table 4).

In addition to the income earned directly from the sheabutter sales, the producers get paid bonuses from some of the buying companies. Sheabutter production bonuses are additional income paid to sheabutter suppliers in appreciation of the extra efforts put in by the groups and individuals to produce and deliver quality sheabutter. They are also meant to support the sustainability and functionality of the producer association. The bonus paid is a distinct additional payment to the women suppliers aside from their sales income for each kilogram of sheabutter sold to the buyer. Payment of the bonus is made using a given rate (amount per kilogram), designed by the buyer, and communicated to suppliers in each purchase order. Data from Concern Universal showed that in 2018, the total bonus for Naro was Gh¢11,985.00 and it increased to Gh¢13,537.72 in 2019, representing a 13 percent increase. The total bonus for Moyiri increased from Gh¢3,949.40 in 2018 to Gh¢6,862.00 in 2019, representing a 73.7 percent increase. The lump sum of bonuses received by the Associations is distributed proportionally as specified by the buyer into individual bonus, group bonuses, secretarial bonuses, and packaging team bonuses which are meant for varied categories of people who perform distinct roles during the supply process. These go to increase the income level of producers and support in strengthening the capacity of these associations to remain functional.

To confirm the extent of the contribution of the intervention to household income, we compared the average income earned by producers to the minimum daily wage in Ghana. The National Tripartite Committee (2019) pegged the minimum daily wage at GH¢10.65 in 2019. This means that the minimum amount a worker can receive in a year was GH¢3,887.25 (that is GH¢10.65 by 365 days). Using the minimum wage against the earnings from only sheabutter processing business, some producers earned higher than the minimum wage in Ghana. In 2019, 12 out of 160 producers in Moyiri, representing 7.5%, earned the same as the minimum annual wage. In the same year, 51 out of the 132 producers, representing 38.6% in Naro earned above the minimum wage. The views of the survey respondents corroborate the views obtained from the FGDs that the shea butter business increases household income significantly.

The respondents were required to indicate the contribution of shea butter business to income using a three-level scale: low contribution average contribution and high contribution. The scale was limited to three to allow comprehensive translation into the local language, the mode of administering the research tools. About 8.6 percent and 7.9 percent of survey respondents in Moyiri and Naro respectively, rated the contribution of shea butter business to livelihood as average. Interestingly, in Moyiri and Naro, 91.4 percent and 92.1 percent of the respondents respectively rated the contribution of sheabutter business to their livelihood as high. The high incomes translated into social benefits for the households.

Social Benefits and Acquisition of Assets through Sheabutter Business

The discussion of the survey show that members of the associations were able to acquire assets with the income they generated from the sheabutter processing. These assets include cooking utensils; a water reservoir (poly tank) for storing potable water; basins for drawing water and use in sheabutter processing. The Naro Shea Association at the point of production had received premiums for some of their supplies. In a consensus, the association decided to invest the premium funds into community development initiatives for the benefit of the entire community. It was revealed during the FGD that the Association invested in communal chairs, construction of household toilets and sectional public toilets and a pit for maternal waste disposal at the community clinic". The researchers visited and ascertained that these were procured for general community use.

In Moyiri, the Association was able to purchase 100 plastic chairs for communal use in the community and these were verified by the researchers. In addition to these assets, social services were rendered to household members using income from the sheabutter business. According to the respondents of the survey and the focus group discussion, all the producers have been able to register with the National Health Insurance Scheme (NHIS) and can renew the NHIS membership cards for household members. During the FGD, a respondent in Moyiri noted that women have benefited immensely, indicating that:

"...with the semi-mechanised sheabutter business, we can get enough income and, as such, are able to provide financial support to cater for elderly household members (maiden homes in particular); supported our brothers to perform our parents' funeral rights; provide quality food for the household; pay school fees; and provide learning materials and uniforms for our children" (Excerpts from Focus Group Discussion, May 2020).

In these communities, performing the funeral rites of relatives remains a significant achievement for the children, as it involves financial cost. As indicated above, women were able to mobilise financial resources to perform their parents' funeral rites. This marks as an achievement that would increase their social standing within their marital homes and in their maiden homes.

Other producers invest the income generated in other productive ventures. For instance, a survey respondent in Naro said: *"I have bought a sewing machine for my daughter to engage in apprenticeship to become a seamstress."* Others bought farm inputs such as fertilizer, weedicides, pesticides and rented tractor services with the income earned from sheabutter business. A discussant in Naro said this about the positive effect of the project on farming: *"I have been helping my husband to pay for tractor services and in buying fertilizer for the crops with income from the shea butter business. Our farm size has increased significantly because we can afford inputs and tractor services, and the yields have been good for the past three years"* (Excerpts from Focus Group Discussion, May 2020). Investments made by the producers implies that the sheabutter business has prospects and can yield sustainable benefit to households.

Discussion

The results from this study showed that investment in semi-mechanised sheabutter processing has made significant impact on the livelihood of rural women. Sheabutter business has contributed significantly to the income of women as some producers receive

higher than the minimum wage as pegged at by the National Tripartite Committee. This implies that if the major actor (state) gives special priority to the shea sector, it has the potential of contributing to household income and social upliftment, especially in poverty-ridden areas. This is evident by the high rating of semi-mechanised shea business as a key contributor to household income in rural areas. The findings from these communities reaffirm the view that the shea sector contributes significantly to rural livelihoods (Bup et al., 2014; Pouliot, 2012). Semi-mechanised shea butter business has become a major alternative livelihood to farming. This is because hitherto, the women could hardly find and engage themselves in any viable alternative livelihood activity aside the one-off seasonal farming. As at the time of the study (May 2020), the women were engaged in the sheabutter processing business during the rainy and the dry seasons, especially as and when there are orders to supply sheabutter. As established in previous studies and confirmed by this study, the shea sector potentially serves as a source of employment to many rural women (Hatskevich et al., 2011), including the female youth.

Through sheabutter processing, women were well organised with a common voice and vision. This had positioned them to be able to contribute to decision making at the household level, although a majority of them (81.5 percent of all respondents) were not household heads. The decision at the household level trickles to the community level decision making and collective action toward community development. Therefore, the association of shea producers also promotes social networks. In all the focus group discussions, the women reported the emergence of social solidarity from the regular interactions at the sheabutter processing sites and during Associations' meetings.

This study provides evidence in support of the view that the semi-mechanized sheabutter business has contributed significantly towards improving the living conditions of females and their households. We specifically found out that the adoption of the semi-mechanised production system and the availability of market for sheabutter led to increases in household income, promoted the acquisition of assets and investment in social and economic activities. The usefulness of the intervention in this sense reverberates with similar income-generating approaches elsewhere (Huis et al., 2017; Rajamma, 1993). The pro-poorness of the project is further highlighted by the fact that it targeted poor women in these poverty-stricken settings (Ghana Statistical Service, 2018; GNHR, 2021). Similar benefits in other studies triggered the support from men to allow women to engage in other businesses. The income accumulated from the sale of sheabutter makes it possible for them to afford basic household activities such as health care cost and pay for the education of their children as well as securing household equipment, cookware, and clothing. The ability of women to deliver these services to the household increases their social status in society and within their households in particular (Cornish et al., 2021).

Therefore, the increased income of producers has ramifications on general household well-being. Intriguingly, women have supported their husbands financially and materially for the general welfare and economic progression of their households. These efforts have the potential of reinforcing understanding within families and promoting marital bonds. This is because earlier studies revealed that within the study area, women have the responsibility of ensuring the dietary well-being of households; – while husbands provide the main staple, women are responsible for processing food in addition to providing soup ingredients (Apusigah, 2009). Therefore, women taking further initiatives to support husbands in

producing the main staple and supporting housing are great sources of cementing unity within the households.

The income accruing from the project, as discussed, has helped in increasing women's self-esteem manifested by their capacity to afford basic needs for the household. The increased income of women positioned women to achieve genuine women empowerment because it has improved women's social position both in their marital homes and their maiden homes. This has promoted social cohesion and bonds among women. This helps to increase women's self-worth and minimises the perception of men towards women as people of lower status (Mahmud et. al., 2012). Therefore, there is compelling evidence from the analysis and discussion that the semi-mechanized sheabutter processing intervention addresses the integrated approach, and the economic development dimension of women's empowerment (Batliwala, 1994).

There is growing evidence that shea can contribute to local and national economic development if given the necessary policy attention similar to the cocoa subsector in southern Ghana. Climate change and its associated adverse effects on agriculture provide an opportunity for the shea subsector, which is resilient to climate change, to be given the needed policy attention. This will further enhance the contribution of the subsector to sustainable development goals one, five, and eight (SGD 1,5 and 8). This is highly possible because the private sector has been playing significant roles in enhancing women livelihood using the shea sector.

Conclusion

This study examined the role of semi-mechanised sheabutter processing business in livelihood enhancement, particularly among rural women. The introduction of semi-mechanised processing of shea butter has enabled women to diversify their livelihood as all respondents had at least one source of income. The income level from shea butter is directly proportional to the quantity of shea butter produced and sold. The quantum and frequency of sheabutter produced are influenced by transportation, social events, social obligations towards parents and children and availability of raw materials. It is intriguing to note that although sheabutter is not perishable good, improved transportation network and condition play roles in promoting shea butter business. With the use of semi-mechanised production technology and the integration of sheabutter producers at the base (local level) into the global market, the sheabutter processing business has contributed greatly to households' income. This has increased their support to households in terms of decision making, households' arrangements, housing and general community development. Shea butter processing has become a leading sector (the sector that contributes higher to household income) in the communities and still has prospects. Therefore, with continuous support in the form of training in pricing and negotiations skills, quality butter production, equipment supports and linking producers to the market, the shea sector can be a main driver of rural households' livelihoods in Northern Ghana. We sum up the discussion by reiterating that the semi-mechanised sheabutter project intervention has great potential for women's empowerment and fits into the broader objectives of the SDGs. It is clear from the discussion that the semi-mechanized sheabutter project has contributed to and continues to contribute to the transformation of unequal gender relations and empower women in the study setting and beyond.

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