International Journal of Scientific and Management Research
Volume 8 Issue 2 (February) 2025
ISSN: 2581-6888
Page: 22-39

An Assessment of Local Communities' Willingness to Upscale and Diversify Sisal Production in Eswatini: A Case of Ekupheleni Chiefdom

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DOI - http://doi.org/10.37502/IJSMR.2025.8203

Abstract

This study assesses the willingness of local communities to upscale and diversify sisal production in the Kingdom of Eswatini, using Ekupheleni chiefdom as a case study. The study investigated the knowledge level that community members have on Sisal production as well the willingness to upscale and diversify sisal production. A cross-sectional research design was employed in the study. Data was collected through in-depth interviews administered to 200 conveniently selected heads of households and 32 participants in the Sisal industry, whose list was provided by the Home Economics Department in the Ministry of Agriculture. Furthermore, data was collected through key informant interviews from four extension officers from the Department of Home Economics in the Ministry of Agriculture as well as through direct observation of the community. The data was entered into a Microsoft Excel spreadsheet and presented using frequency tables and graphs. The data was analysed using cross-tabulation and STATA version 12 to build regression models. The findings indicate that heads of households and participants in the Sisal industry held traditional forms of knowledge passed from generation to generation; participants were willing to upscale and diversify Sisal production.

Keywords: Sisal production, up-scaling and diversifying, industry, Ekupheleni chiefdom, participants.

1. Introduction

Sisal is a xerophytic, monocarp, semi-perennial leaf fibre producing plant, which is resistant to drought (Sarkar and Jha, 2017). The Sisal plant is a perennial succulent that fully blossoms with a complete flower head including the stems, stalks, bracts, and flowers, after 6-9 years and produces 200-500 leaves in its lifespan (Kanogu et al., 2011). As it is typical with xerophytic plants, Sisal leaves are thick, fleshy and often covered with a waxy layer (Sarkar and Jha, 2017; Figure 1). According to Srinivasakumar et al. (2013), the major species of agave available are Agave sisalana, Agave mexicana, Agave americana, Agave cantala, and Agave veracruz. Among the agaves, the most common is Agave sisalana, commonly known as Sisal and contributes nearly 85% of the world's total Sisal fibre production (Sarkar and Jha, 2017). Sisal is a versatile and sustainable fibre, providing the world's most important of the natural hard fibres used in a wide range of applications, including twine, rope, cordage, and mats. Agave sisalana is a native of the Yucatan peninsula, Mexico, a south-eastern region known to be where crops of economic importance originated, Sisal was domesticated in the 1830s and

then introduced in the United States, where it was expected to thrive in the subtropical regions of Florida (Trejo-Torres et al., 2018).

Figure 1: Sisal plantation

Source: McDonald (2016)

The Sisal plant grows in semi-arid to arid climates, it has the potential to grow on lands that are not suitable for other crops and are labelled marginal. The Sisal plant is a renewable resource, and contributes immensely to climate change solutions (Lok Sanjh Foundation, 2016). This is due to the fact that Sisal absorbs more carbon dioxide than it produces over its lifespan (Food and Agriculture Organization, 2016). Sisal can withstand maximum temperatures of near 50̊ C and grow well in evenly distributed rainfall of 60-125 cm, however excessive rain causes water stagnation and very low temperatures cause frost which tends to damage the plants (Davis and Long, 2015; Sarkar et al., 2010). Sisal is mainly cultivated for its fibres, which are extracted from the leaves. The plant is typically grown without irrigation or fertilization, and grows large, sword-shaped, thick, fleshy leaves that emerge from the root, with a sharp pointed and generally with a spiny margin and short but stout stem (Figure 1). Each rosette grows slowly over the period of its lifespan, an average of 6-9 years, and flowers only once (Anandjiwala and John, 2010; Kanogu et al.,2011). For example South Africa commercial farms and state owned farms that have recently become operational again after a decrease in Sisal over the past decade, produce 2000 tons of Sisal in a year (Department of Agriculture, Forestry and Fisheries, 2015)

The production of Sisal encompasses four major aspects namely production, harvesting, processing and marketing (Jeckoniah, 2018). The production of Sisal involves different activities from the first stage to the final stage, referred to as a value chain. In the first stage of production, there are numerous activities such as land preparation, planting or replanting and field maintenance. Harvesting and hauling are the second stage and involve field testing, cutting, loading and transportation. The third stage which is processing has activities that include feeding, decorticating, drying, brushing, grading and baling. Lastly, the marketing stage involves transporting, stocking and shipping. All these stages add value to the cultivation of Sisal (Kasyamakula, 2022).

The most valuable part of the Sisal plant is the fibre, extracting Sisal fibre is therefore a significant part of production (Figure 2). Suckers which grow around the plants are used for replanting (Lok Sanjh Foundation, 2016). The Sisal plant is usually harvested 24-36 months into the growing process. A process of decortication is used to extract the fibres from the leaf tissues. The leaves are crushed and beaten by a rotating wheel set with blunt knives, so that

only the fibres remain. This is done by large scale harvesters (Kanogu et al., 2011; Srinivasakumar et al., 2013). Smallholder harvesters use their hands to remove the outer green leaves and thorns are removed using knives, the bare fibres are then beaten against hard surfaces such as rocks to separate the fibres and form threads or the fibre is extracted by putting the leaves between a piece of flat wood and aluminium cans (Mkhonta et al., 2014).

Figure 2: A farmer working on Sisal plants in Haiti:

Source: Concern Worldwide (2016)

The Sisal processed by large industries can be used for a variety of industrial products from heavy industrial uses such as composite material for the automotive industry (Dlamini et al., 2014). Due to its great strength Sisal fibres are generally used in fibre industry for manufacturing general and marine ropes, twine, sacking, and carpet, due to their better spinning characteristics and resistance to infiltration of briny water (Naik et al., 2013). Sisal is domestically used to flavour petroleum jelly while the fibres produced are used to craft baskets, bracelets and other artefacts which sustain the crafters in rural areas and their families (Zwane et al., 2011). For example, in the Kingdom of Eswatini rural women are known for creating fine pieces of art, jewellery and decorations from sisal, grasses and reeds (Mkhonta et al., 2014).

Undertaking Sisal cultivation in low to middle income countries has the potential to contribute immensely towards economic development of that given country resulting in improved standards of living (Mwaniki et al., 2017). The Sisal production industry offers countries like Eswatini an excellent way to achieve the Sustainable Development Goals (SDGs). A good example is the 9th SDG which focuses on industry, innovation and infrastructure, specifically it aims to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation, which calls for the efficient and better use of resources in order to sustain the planet and its future population (Denoncourt, 2020). There is therefore, a need for the current study to assess the viability of up-scaling and diversifying of Sisal production in the Kingdom of Eswatini.

Conceptual Framework

According to Tamene (2016), a conceptual framework is a set of ideas, beliefs, and theories that support and guide a study. It explains the main things to be studied, the key factors, concepts, or variables, and the presumed relationships among them. Figure 3a shows that any change in the independent variables is directly linked to the dependent variable, and the outcome may be positive or negative, depending on the study's objectives. According to Mwaniki (2013), factors such as knowledge level of Sisal production stages, level of education,

land availability, perceived opportunities and challenges all contribute to Sisal cultivation and adoption.

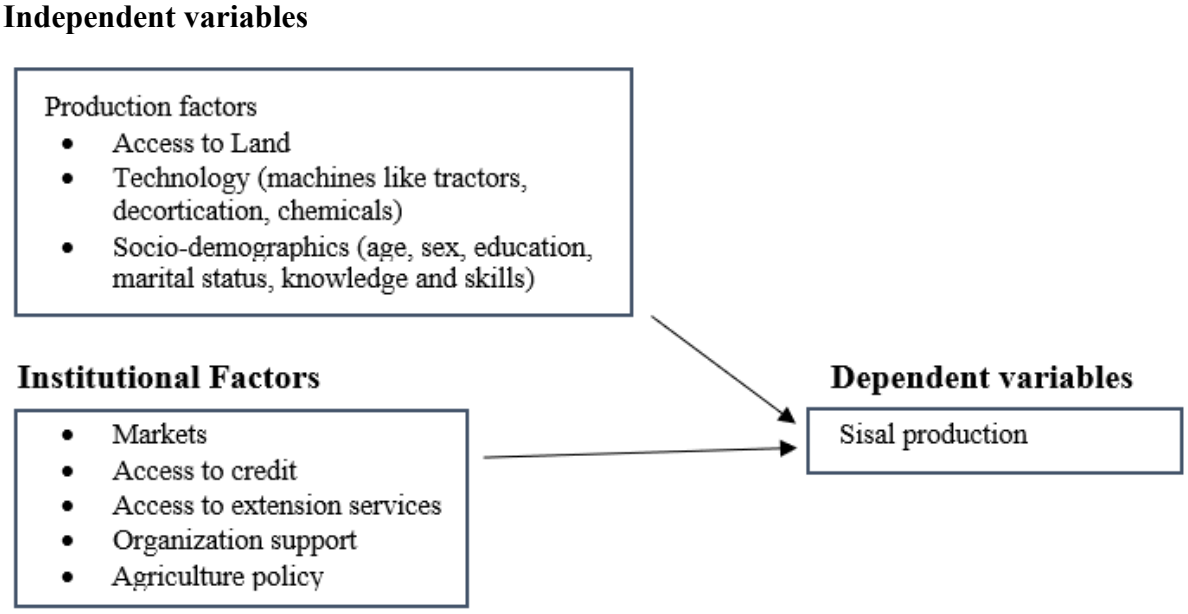

Figure 3a: Conceptual Framework adapted from Kasyamakula (2022)

Based on the objectives of the study, Figure 3b shows that the relationship between the independent and dependent variables is direct and affects production positively or negatively. The viability of up-scaling and diversifying Sisal production is dependent on the level of knowledge on Sisal production, including cultivation, production levels, and market dynamics.

By acquiring knowledge of modern cultivation practices, including the use of technology such as tractors, decortication machines, and chemicals, as well as gaining access to credit, market opportunities, extension services, hybrid sisal seedlings/plantlets, and reasonably priced land, it is possible to significantly increase sisal production. This can result in a maximum annual harvest of several tons (Kasyamakula, 2022). In order to upscale and diversify the production of Sisal in Ekupheleni and the Kingdom of Eswatini as a whole, it is important to investigate the level of knowledge held by community members on cultivation, production levels, and market dynamics. By introducing changes to these independent variables, either by increasing knowledge or not introducing knowledge, we can observe how it affects the dependent variable of Sisal production.

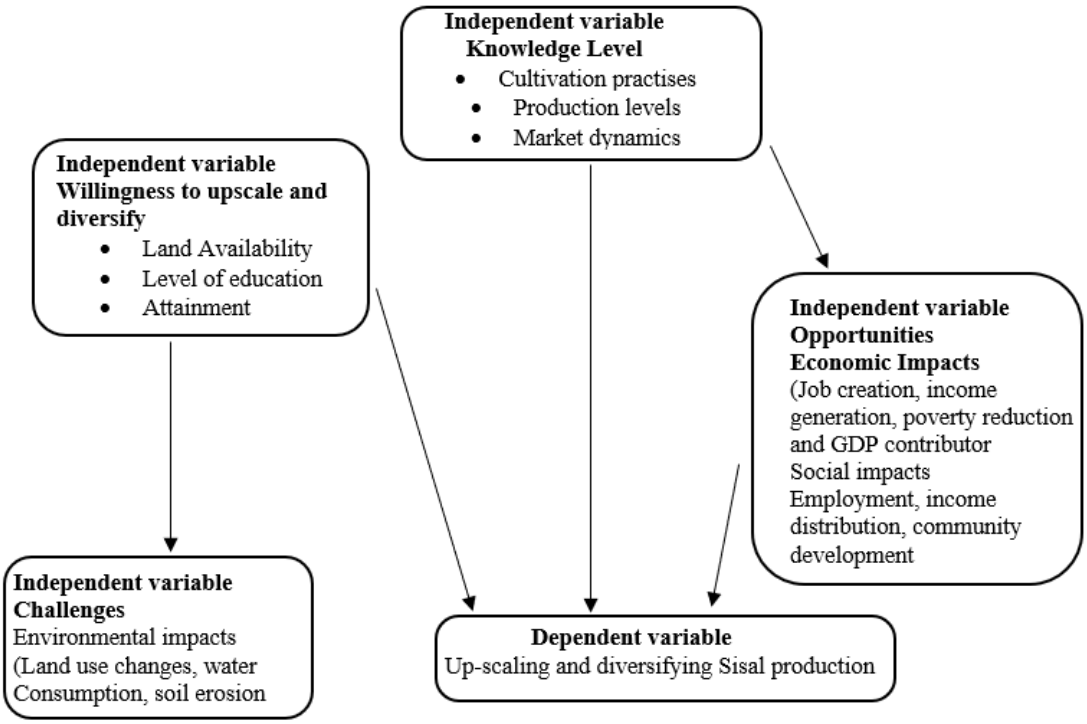

Figure 3 b: Conceptual framework of assessing the viability of up-scaling and diversifying Sisal production

Willingness is a factor that influences the up-scaling and diversification of Sisal production. This factor is independent and can be influenced by various variables such as the availability of land for Sisal cultivation, as well as the education level of community members. Individuals with access to land and higher education levels are more likely to show a willingness to undertake Sisal production and potentially upscale and diversify it.

Problem Statement

In rural communities of the Kingdom of Eswatini, community members use the Sisal plant to flavour petroleum jelly, craft baskets, bracelets and other artefacts to sustain themselves and their families. However, these activities are done on a small scale and contribute very little towards alleviating poverty. Additionally, these community members have no access to knowledge that could assist them in up-scaling and diversifying their production of Sisal artefacts. Crafts made from Sisal have traditionally been an important source of income for individuals in rural communities, such as Ekupheleni. The willingness of community members to upscale and diversify Sisal production in rural communities of Eswatini has not been assessed nor documented, hence this study at Ekupheleni community.

Main Objective

To assess the viability of up-scaling and diversifying sisal production in the Kingdom of Eswatini, using of Ekupheleni chiefdom as a case study.

Specific Objectives

1. To investigate the knowledge held by local communities on sisal production.

2. To assess the willingness of local communities to upscale and diversify sisal production

Study area

The study was carried out in the chiefdom of Ekupheleni which falls under the Inkhundla of Motshane in the Hhohho region of Eswatini. The study focuses on Ekupheleni chiefdom mainly because a majority of Sisal users are located in the Hhohho region.

Ekupheleni chiefdom is found between latitudes 26˚18′ 22″S and 26˚19′ 22″S and longitudes 31˚1′ 3″E and 31˚2′ 3″E, (Figure 4). Ekupheleni is located in the Highveld physiographic region. The Highveld region is "the upper part of an overall escarpment, consisting of a complex of steep slopes between low and high levels, dissected plateaux, plateau remnants, and associated hills, valleys and basins" (Mapako, 2011: 2). The steep slopes found in Ekupheleni chiefdom are suitable for the cultivation of Sisal. This is primarily because Sisal is known to grow in poor soils that are prone to acidity (Srinivasakumar et al., 2013). The Ekupheleni chiefdom is located 34 km away from the capital city, Mbabane.

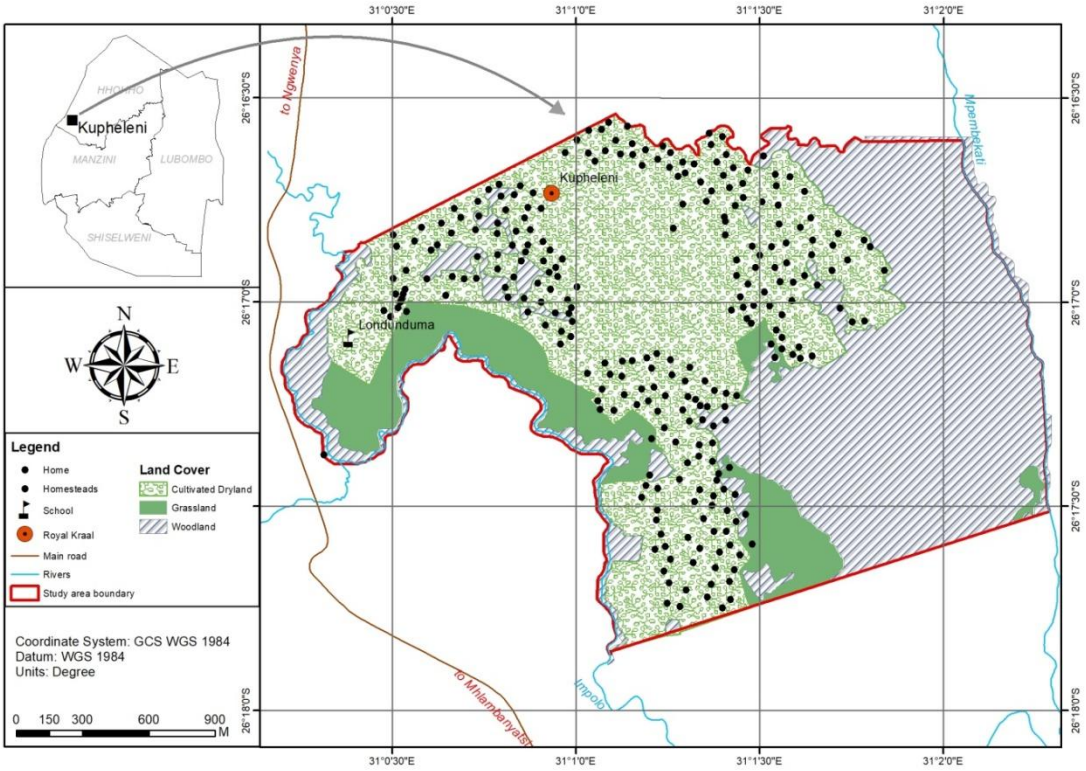

Figure 4: Ekupheleni chiefdom

2. Materials and methods

This study employed a cross-sectional research design. According to Omair (2015), a cross-sectional research design takes a representative sample from the population to generalize the findings to the entire population. The population of interest included heads of households at the Ekupheleni chiefdom, participants in the Sisal industry, Home Economics extension officers, and Ministry of Agriculture officials.

Ekupheleni chiefdom had approximately 1 192 homesteads (CSO, 2017). To determine the sample size, the study applied Yamane's (1967:886) simplified formula, which produces a 95% confidence level and p= 0.5, using tables.

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

Where n is the sample size, N is the population size and e is the level of precision (Israel, 1992).

$$n = \frac{1192}{1+2\ 614(0.05)^2}$$

$$= \frac{1192}{6.5375}$$

$$= 182$$

The study employed convenience sampling, whereby participants were selected based on availability and willingness to answer questions. According to Farrokhi and Mahmoudi-Hamidabad (2012), convenience sampling is a non-probability sampling method where respondents are chosen based on their availability and accessibility, rather than being randomly selected from the entire population. From the sampled 182 homesteads data was collected from heads of households. Since some homesteads had more than one household, in-depth interviews guided by a semi-structured questionnaire were administered to a total of 200 heads of households.

Moreover, the Ministry of Agriculture provided a list of 32 participants who work closely with the Ministry, who were also interviewed. The participants use the Sisal plant for crafting and manufacturing petroleum jelly. Furthermore, four key informants from the Department of Home Economics were interviewed, along with two government officials from the Ministry of Agriculture were also interviewed.

In addition, participatory observation was conducted during the harvesting, processing, and marketing of the finished Sisal products. This was meant to provide first-hand experience and insights into the current practices, challenges, and potential for improvement. A brief market survey was also conducted to gather data on Sisal crafts demand, supply dynamics, price trends and potential market opportunities for diversified Sisal products.

The data was inputted into a Microsoft Excel spreadsheet, which was then used to cross-tabulate the data and produce frequency tables and graphs. The findings are presented using tables, graphs and narratives. Furthermore, STATA version 12 was used to analyse the data and build regression models to determine the relationship between variables to upscale and diversify Sisal production.

3. Findings and discussions

This section presents the findings of the study from heads of households at the Ekupheleni chiefdom, participants in the Sisal industry, and extension officers from the Home Economics department in the Ministry of Agriculture as well as direct observations.

Demographic characteristics of respondents

The findings from heads of households indicate that 38% of respondents were in the 60-69 age group, with 1% of the respondents in the age group of 80+ (Table 1). Notably, 2% of the

respondents were below 20 years of age, which means that, there are child-headed families (Table 1). The findings also indicate that 69.5% of the respondents were males and 30.5% were females. With respect to participants in the Sisal industry, the findings indicate that 78% were females and 22% were males. The findings also indicate that 47% of the participants who use Sisal to manufacture petroleum jelly and brooms are women in the age group of 50-59 years, followed by those in the age group of 40-49 years at 22%, and those aged 20-29 and 60-69 years comprise the smallest number of participants at 9% each (Table 1).

Table 1: Age of heads of households and participants in the sisal industry

Age	Heads of households		Participants in the Sisal industry	
	Frequency	Percentage (%)	Frequency	Percentage (%)
below 20	3	2	0	0
20-29	4	2	3	9
30-39	3	2	4	13
40-49	46	23	7	22
50-59	40	20	15	47
60-69	75	38	3	9
70-79	27	14	0	0
80+	2	1	0	0
Total	200	100	32	100

The study also included four key informants consisting of three (3) females and one (1) male, all aged between 35-49 years. In terms of education attainment, three informants had tertiary education while one had high school education.

With respect to the heads of households, 67% of the respondents in the age group of 70-79 years had not received any form of education (Figure 5). On the other hand, respondents with higher educational attainment (tertiary education) were in the age groups of 60-69 (40%) and 50-59 (37%) years (Figure 5). The data, when cross-tabulated with levels of educational attainment showed that heads of households generally had very low levels of educational attainment. Notably, younger heads of households were generally unemployed mainly due to academic commitments and a lack of employment opportunities (Figure 6a). On the other hand, the findings on participants in the Sisal industry indicate that 31% were employed, 47% were unemployed and 22% were self-employed (Figure 6b).

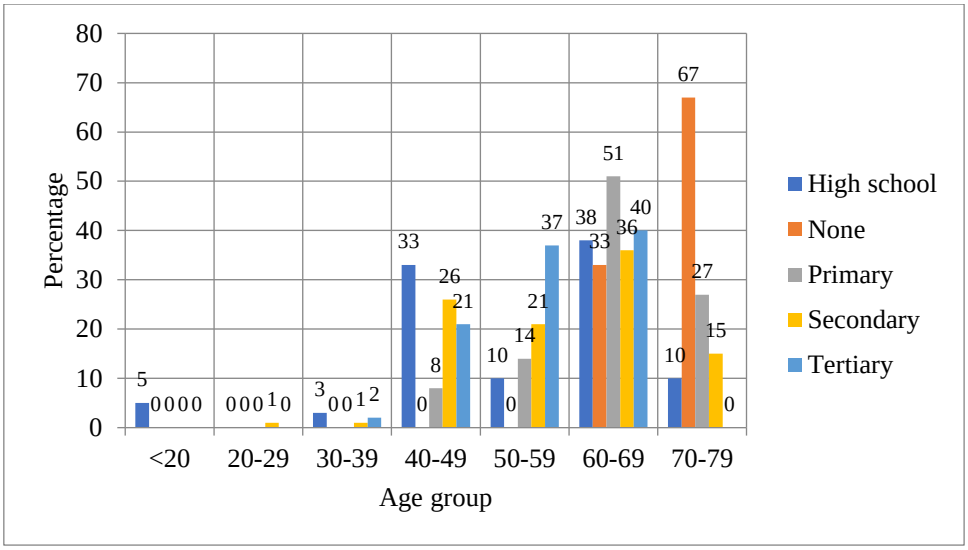

Figure 5: Age and level of education of heads of households

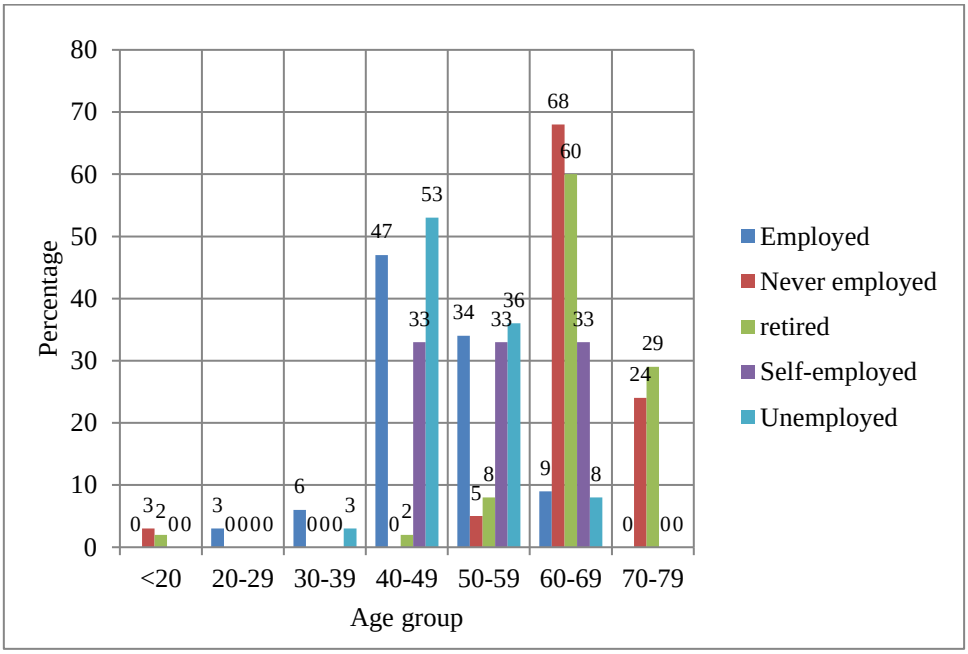

Figure 6a: Age and employment status of heads of households

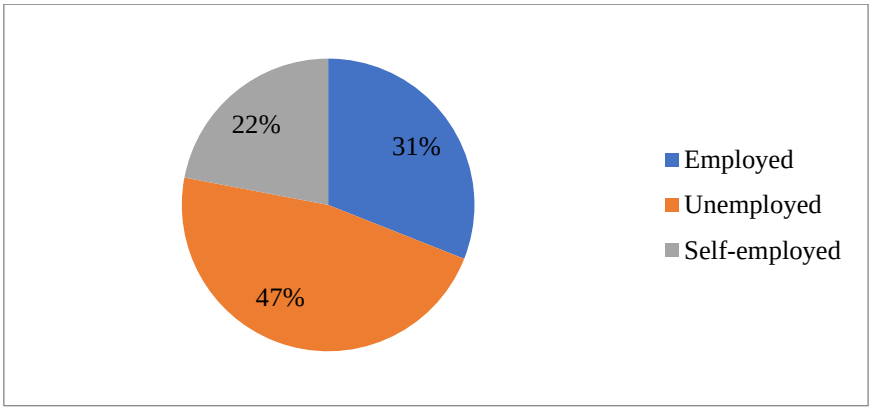

Figure 6b: Employment status of participants in the Sisal industry

Knowledge level of respondents

When heads of households were asked about their level of knowledge of any Sisal production stage, 35% of the males and 8% of the females stated that they had little to no knowledge of Sisal production (Figure 7a). On the other hand, 12% of female respondents indicated having knowledge on the processing of Sisal and only 4% of male respondents had knowledge of processing Sisal (Figure 7a). They further stated that the knowledge they had was indigenous knowledge obtained from watching their grandmothers utilize Sisal fibres to make brooms. When asked about harvesting, 25% of male respondents indicated that they had some knowledge and only 4% of female respondents had knowledge on Sisal harvesting (Figure 7a).

Respondents further likened Sisal harvesting to aloe harvesting, stating that they cut it at the base of the plant with sharp knives. Only 8% of all the respondents indicated having knowledge of Sisal cultivation, however they stated that the knowledge they had was about how to plant Sisal around hedge plantations to protect them from burrowing animals (Figure 7a). It is worth noting that, knowledge level of respondents about Sisal production is a crucial determinant for up-scaling and diversifying Sisal production. As such, the findings indicate that people at Ekupheleni chiefdom have basic knowledge of Sisal production and they can benefit greatly from up-scaling and diversifying Sisal production.

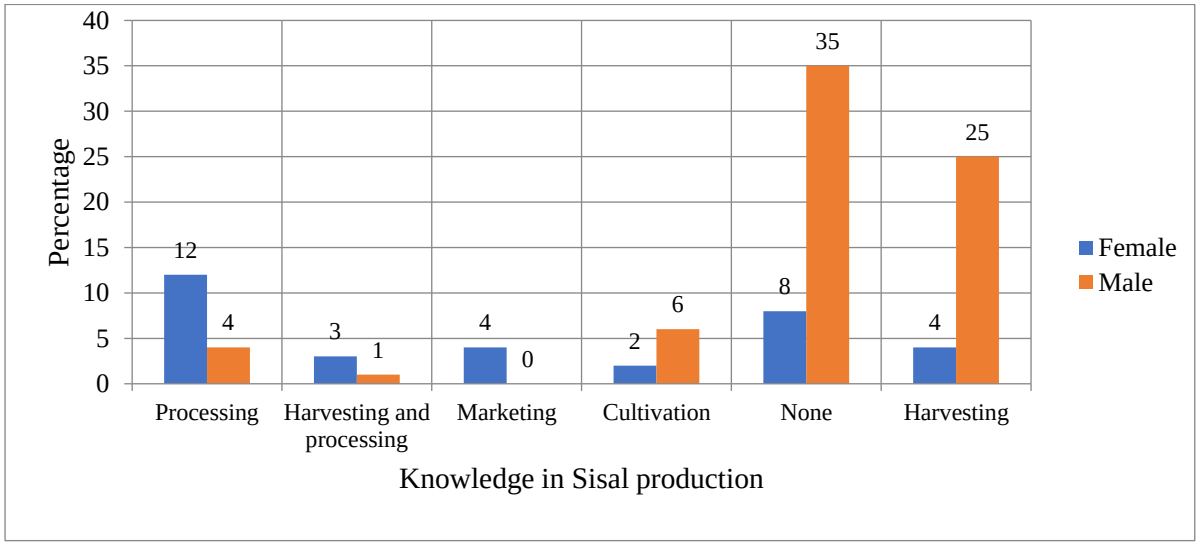

Figure 7a: Heads of households' knowledge level in Sisal production

Participants in the Sisal industry showed very little knowledge of Sisal production. For instance, when asked if they were aware of any Sisal production on a large scale, 22% stated that they were aware, while 78% said they were not aware. It is worth noting that, those who were aware (22%) were males who assisted in the harvesting of Sisal from the mountains at Ekupheleni, while the 78% were women who manufactured petroleum jelly and brooms. The respondents, who were aware of Sisal production on a large scale, understood the climatic conditions needed for Sisal cultivation. In addition, they were aware of how often Sisal needs to be harvested, which is every 6-9 months.

When asked about the current knowledge level they had on any stage of Sisal production, 69% of the participants stated that they had basic knowledge of Sisal processing for the manufacturing of petroleum jelly and brooms (Figure 7b). Moreover, 28% of the participants indicated that they were well versed in harvesting sisal and only 3% had knowledge of how to

market Sisal products (Figure 7b). The participants who had knowledge of Sisal processing for the manufacturing of petroleum jelly stated that they boil the Sisal leaves in hydraulic oil to extract the juice which is then strained and added into pure white petroleum. Participants who had knowledge on harvesting indicated that they cut the inner leaves of the Sisal plant using a bush knife. The participants who were well versed in marketing stated that they distribute the products to street vendors in Mbabane and households in the chiefdom as well as selling to neighbouring chiefdoms, as well as Motshane.

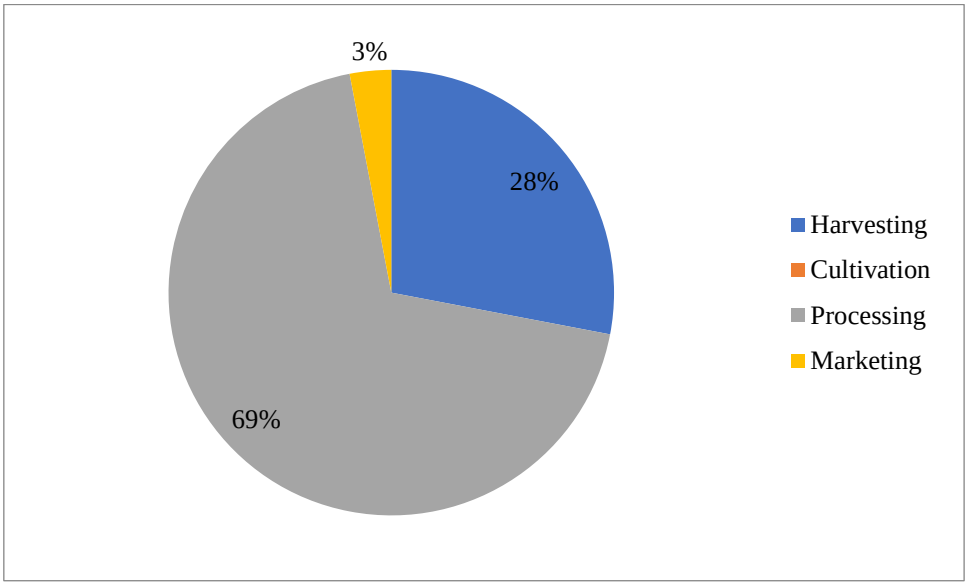

Figure 7b: Sisal user's' knowledge level in Sisal production

Extension workers from the Department of Home Economics in the Ministry of Agriculture indicated that they were only tasked with teaching women in rural areas where Sisal grows naturally and give talks on national radio stations on how to utilize the Sisal, in order to equip them with skills to sustain themselves. They further stated that currently, the government has no initiatives that teach rural communities about natural fibres and their possible usage.

Willingness to upscale and diversify Sisal production

When heads of households were asked about their willingness to upscale and diversify Sisal production, 62% responded that they were willing to undertake Sisal production, citing that any additional economic opportunity could assist them immensely in alleviating poverty. However, 38% of the respondents stated that they were not willing to undertake Sisal production as they were unaware of the intricacies of Sisal production; hence there is no way to determine their risks and benefits. When cross tabulating willingness with gender, the findings show that 28% of male respondents were more willing to cultivate Sisal production (Figure 8). On the other hand, 9% of female respondents were keen to cultivate Sisal (Figure 8).

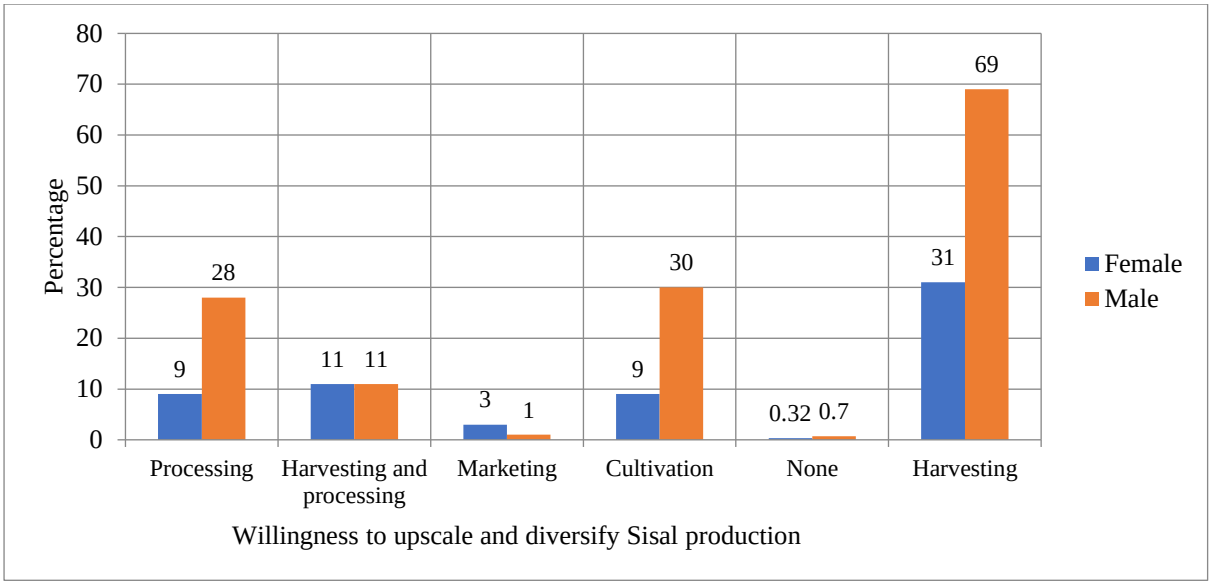

Figure 8: Heads of households 'willingness to upscale and diversify Sisal production against gender

When cross tabulating the data on willingness to upscale and diversify with level of education the findings show that those who were willing comprise 33% of the respondents who had retired from work, 19% had never been employed 18% were unemployed, 16% were employed and 15% were self-employed (Figure 9).

Figure 9: Heads of households 'willingness cross-tabulated with occupation

When participants in the Sisal industry were asked about their willingness to upscale and diversify Sisal production, all participants showed keen interest. Willingness was cross-tabulated with gender where 50% of the female participants showed a keen interest in learning about cultivating Sisal, while no males showed an interest (Figure 10). Regarding harvesting 12.5% of the male participants showed an interest and 3% of female participants did (Figure 10). Moreover, 12.5% of the female participants and 3% male participants showed an interest in learning about harvesting in combination with cultivation (Figure 10). With processing of

new products 12% of the female participants showed willingness (Figure 10). Only 3% of female participants showed interest in learning about marketing of Sisal products (Figure 10). The findings show that a majority of the participants were keen to learn about cultivating Sisal. They alluded to the fact that their own Sisal plantation would assist in the efficiency of production and provide an additional source of income as they would sell it to other communities.

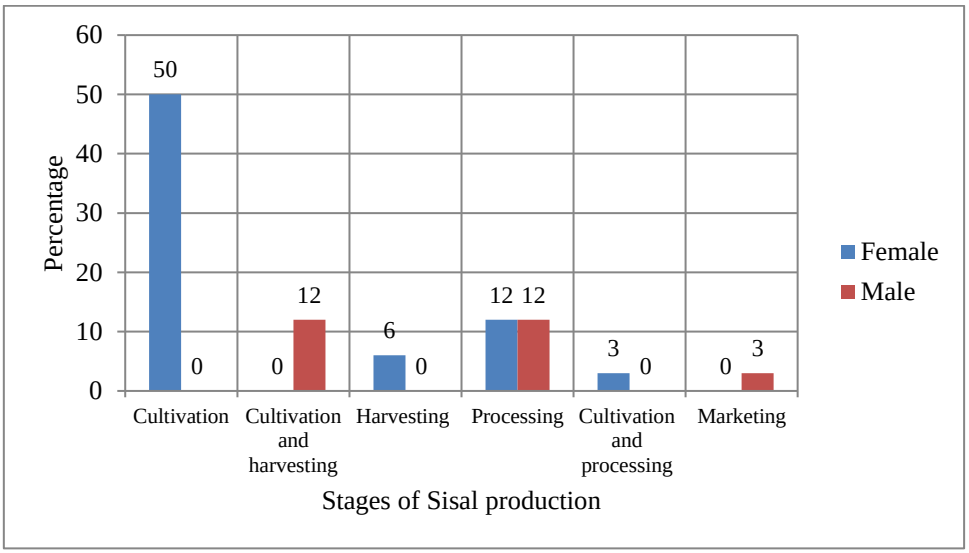

Figure 10: Stages of Sisal production where participants in the Sisal industry have an interest

Data on willingness to upscale and diversify Sisal production was then modelled against the level of education to determine whether there was a relationship between these variables or not (Table 2). The model explains the relationship between the dependent variable (willingness to upscale and diversify sisal production) and the independent variable (level of education). For instance, the R-squared value in the model is 0.2624 which indicates that the model does not explain any of the variation in the dependent variable (Table 2). The F-statistic's p-value is 0.0027, which is less than the significance level of 0.05, indicating a statistically significant relationship between the education level and willingness to upscale and diversify sisal production (Table 2). The coefficient's p-value is also less than 0.05, indicating statistical significance. The coefficient value is -3.728, suggesting that the willingness to upscale and diversify sisal production decreases as the level of education increases (Table 2). Therefore, rural areas with a larger population of individuals with a low level of education would be more suitable for up-scaling and diversifying sisal production.

Table 2: Regression model willingness to upscale and diversify sisal production and level of education

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Source	SS	df	MS	Number of obs =	32
Model	715.805825	1	715.805825	F(1, 30) =	10.67
Residual	2012.19417	30	67.0731392	Prob > F =	0.0027
				R-squared =	0.2624
				Adj R-squared =	0.2378
Total	2728	31	88	Root MSE =	8.1898

willingness	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
educcodes	-3.728155	1.141223	-3.27	0.003	-6.058845	-1.397466
_cons	32.81068	5.19852	6.31	0.000	22.19388	43.42747

Extension workers from the Department of Home Economics identified several essential factors that affect farmers' willingness to upscale and diversify sisal production. These factors can be broadly grouped into economic, social, and environmental considerations. Notably, economic factors such as market access and price stability play a crucial role in community members' investment decisions. Community members are more likely to invest in upscaling and diversification if they have reliable access to markets for their sisal products and can expect stable prices. Therefore, financial incentives and support, such as access to credit, grants, or other financial support mechanisms, can significantly reduce the initial investment burden and make up-scaling and diversification more feasible for rural communities.

Moreover, profitability and potential income are also crucial factors that influence communities' decisions to upscale and diversify sisal production. Farmers need to be convinced that up-scaling and diversifying sisal production will lead to increased profits and improved livelihoods compared to their current practices. Clear evidence of the economic benefits is crucial to encourage adoption. Social factors such as land availability and tenure security are also critical considerations. Community members need to have access to sufficient land with secure tenure to invest in long-term sisal cultivation. Land scarcity or insecure land rights can create significant barriers to up-scaling.

4. Discussions and Conclusions

Knowledge held by local communities on sisal production

The overall observation is that community members at Ekupheleni chiefdom have some knowledge of the different stages of Sisal production. However, a large number of heads of households had no knowledge whatsoever when it comes to Sisal production. Nonetheless, some heads of households showcased knowledge on Sisal production and cited that their source of information on Sisal production was passed down from generation to generation. Participants in the Sisal industry at Ekupheleni chiefdom had more knowledge in terms of processing Sisal, but very little knowledge when it comes to cultivation of Sisal.

The findings on knowledge of Sisal production are corroborated by Santos and Silva (2010), in a study conducted in Mexico, where they observed that the knowledge held by members of the community regarding Sisal production is vast and priceless. This includes generations of accumulated wisdom on various aspects, ranging from cultivation practices to processing techniques, which have been passed down through oral traditions and hands-on experience. Noteworthy is that, indigenous knowledge plays a crucial role in the sustainable management of Sisal and also impacts the livelihoods of communities that rely on it. This therefore, shows that community members in the Kingdom of Eswatini do have knowledge of Sisal production.

Furthermore, the findings on the knowledge held by community members at Ekupheleni chiefdom indicate that knowledge varies with gender and age. The overall observation is that males are more knowledgeable about Sisal production than females and that people in older age groups are more knowledgeable than people in younger age groups. These findings are corroborated by Kasyamakula (2022) who observed that factors such as age, sex, and marital status influence the level of knowledge. The study discovered that males who engaged in Sisal cultivation were more knowledgeable than women. Despite being less knowledgeable, Houinsa (2013) and Dekens and Voora (2014) observed that women perform the majority of agricultural activities related to Sisal production.

Willingness to upscale and diversify

The findings indicate that the decision of community members to expand and diversify Sisal production is a multifaceted matter that is influenced by several social, economic, and environmental factors. While some community members showed a keen interest in the prospects of increased production and a wider range of products, others were hesitant and required specific conditions to be met. For instance, a majority of participants were willing to upscale Sisal cultivation along with diversifying the products made from it. Moreover, the participants were eager to cultivate their own Sisal as that would give them the opportunity to easily access the Sisal and further sell it to their surrounding communities.

Furthermore, the findings indicate that willingness to upscale and diversify Sisal production is determined by a variety of factors such as gender, with males being more willing to upscale Sisal production than females. Another factor considered in the study was the level of education where the level of willingness was higher among individuals of lower education and decreased as educational attainment increased. Land availability was also a factor that determined willingness to upscale and diversify Sisal production, with participants who reside on Swazi Nation Land more willing than those who reside in rental units. Occupation was also a determining factor whereby retired individuals showed more willingness than those who were currently employed. This, therefore, justifies the need to upscale and diversify Sisal production.

These findings are corroborated by the Lok Sanjh Foundation (2016), which observed that local communities are eager to adopt Sisal cultivation due to recent climatic changes and decreasing water supplies. However, findings by Mwaniki (2013) indicate that communities in Mwingi Central Sub-County in Kenya have been hesitant to adopt Sisal cultivation due to various reasons being aware of the economic benefits of cultivating Sisal. The community members of Mwingi Central Sub-County in Kenya are still reluctant to adopt the crop.

Conclusion

Based on the findings of the study, community members do have knowledge on Sisal production and its various stages. However, the knowledge held about Sisal production is traditional knowledge passed down from generation to generation and lacks current innovative information. Additionally, knowledge levels vary at each Sisal production stage, with Sisal processing having the highest knowledge level. The willingness of communities to upscale and diversify is determined by factors such as gender, occupation and level of education.

Recommendations

The study aimed to assess the viability of upscaling and diversifying Sisal production. Innovative and current knowledge is required in order to undertake Sisal production especially in the 21st century. However, community members only have knowledge that was passed down to them by their forefathers. Therefore, the study recommends that the Ministry of Agriculture, under the Department of Home Economics, initiate capacity building and skill development programmes in the rural communities of Eswatini. This can be achieved by providing training on improved cultivation techniques, processing methods, product development, and financial management. Additionally, the Department could promote knowledge sharing and collaboration among community members by encouraging them to form cooperatives and groups. This will help them learn from each other, and foster collective bargaining power and knowledge dissemination.

Moreover, the study observed a lack of willingness to upscale and diversify Sisal production because community members do not know the risks that come with it. Therefore, the study recommends that the Ministry of Agriculture should emphasize the importance of starting small and gradually upscaling the process. Communities should be given enough time to adapt and learn before expanding further. Additionally, it is recommended that the Ministry encourage community members to diversify their income sources beyond Sisal production. This will help mitigate risks and ensure food security. There is a need for collaboration with NGOs, research institutions, and government agencies to seek partnerships and support. This will help them access funding, technical expertise, and market linkages. Lastly, there is a need for regular monitoring and evaluation of progress to assess the impact of upscaling and diversification efforts, and to adjust as needed to ensure long-term success.

In terms of recommendations for further studies, they should include conducting a comprehensive social impact assessment of up-scaling and diversifying Sisal production. This could be done by evaluating how expanding sisal production could affect job creation, income distribution, gender equality, and community livelihoods. Conversely, an assessment of environmental impacts could be conducted to assess the environmental footprint of Sisal production.

This could be carried out by analysing the impact that increased sisal production could have on the environment, including water usage, waste generation, and potential land-use changes. Finally, strategies for mitigating negative impacts of increased Sisal production could be developed. This could be done by investigating practical measures to minimize any negative social and environmental consequences and promote sustainable production practices.

Compliance with ethical standards

Acknowledgments

Special thanks to the respondents for cooperation during data collection.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Funding

No funding was received for this study. The study was funded by the authors

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