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# Socio-economic benefits and challenges confronting oil palm production among indigenous rural farmers in Karonga district, Malawi

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This study investigated the socio-economic benefits and challenges of oil palm production among indigenous rural farmers in Karonga District, Malawi. The study adopted a mixed-methods approach, triangulating data using questionnaires, interviews, and focus group discussions. The questionnaires were administered to 477 households involved in oil palm production. Further, eight key informants were interviewed, and four focus group discussions were formed. This study, in examining oil palm production's importance for sustaining indigenous rural farmers' livelihoods found a multifaceted role in addressing food through cooking oil production, creating employment opportunities, and meeting other basic needs. Despite these benefits, challenges such as access to market, farm equipment, information and extension services, and credit persist, hindering production and socio-economic progress. Again, the Pearson correlation analysis between acres of land cultivated and benefits from oil palm production revealed  $-0.195$  with a sig value of  $0.000$ , signifying that as more acres of land farmers cultivate, benefits tend to reduce moderately. The researchers therefore recommended that the Malawi Ministry of Agriculture should collaborate with other stakeholders in the agriculture sector, including financial institutions and the manufacturing industry, in the provision of extension services as a means of information access, creating the market, and providing credits to indigenous rural farmers so that they can invest and buy equipment necessary for this agricultural activity.

## KEYWORDS

agriculture, indigenous rural farmers, livelihood, oil palm, oil palm production, poverty

## Introduction

Globally, agriculture raises people's socioeconomic standing because it is their primary source of income, most importantly the poor, who are disproportionately affected by it (Kalu et al., 2023). In developing nations such as Malawi, agriculture is essential for maintaining population food security, generating foreign exchange, opening up job possibilities, and lowering import costs, all of which establish the groundwork for future economic growth (Todaro and Smith, 2009; Udemezue and Osegbue, 2018). Additionally, as per the Food and Agricultural Organisation (FAO) (2019), the world gross domestic product (GDP) is attributed to agriculture at a rate of 4%; in certain least-developed nations, this percentage can surpass 25%.

Through agriculture, oil palm (*Elaeis guineensis*) production provides rural residents a viable means of escaping poverty (McCarthy et al., 2012). One of the many attributes of oil palm is its high yield or the amount of oil generated per unit of farmed land. The fruits of the plant can provide two distinct products: palm kernel oil from the fruit's seeds and palm crude oil from the fresh fruits (Chiriaco et al., 2022). Once more, oil palm is a valuable commodity since goods made from its fruits are used extensively in industry and residential settings to make cosmetics and edible food. In terms of vegetable oil, oil palm and its related products are traded widely worldwide, making up around 60% of total trade, and roughly 25% of the vegetable oil consumed worldwide comes from oil palm and its by-products (World Bank, 2010). Additionally, oil palm is used at the industrial level to make a wide range of potentially useful products, such as cooking oil, red oil, sweetened condensed milk, margarine, emulsifiers, and pulp and paper. It can also be processed to make alcohol, composites, activated charcoal, organic solvents, lubricants, soap, candles, pharmacy items, and cosmetics (Sarku, 2017). Further, in nations like Indonesia and Malaysia, the cultivation of oil palm directly affects employment, dividends and government taxes (Dahlani and Maharani, 2018).

In the context of supporting the livelihood of rural populations where oil palm is produced, such as in Malaysia, Indonesia, Ghana, and Nigeria, the contribution of oil palm production to rural livelihoods, cannot be overstated. The key question about livelihood is how people make a living. At the individual level, a person's means of subsistence is defined as the particular pursuits and assets they use to make a living (Scoones, 2013). Included in this are wage labour, self-employment, and farming for subsistence. The collection of assets and pursuits that promote the overall wellbeing of the household is referred to as the livelihood at the household level (Scoones, 2013). As such, oil palm production has been essential to rural farmers' livelihoods since it generates cash, ensures food security, and creates jobs; as a result, it may provide a means of escaping poverty (McCarthy et al., 2012).

Also, scholarly studies have demonstrated that oil palm reduces rural poverty and creates jobs in West African countries such as Ghana and Nigeria. For instance, Khatun et al. (2020) noted that oil palm produces cooking oil for domestic use, is drought-tolerant, and provides a steady source of income among rural Ghanaians. The crop, which is primarily grown by farmers in rural areas, is essential for the survival of rural populations. Oil palm in Ghana is used to produce two different kinds of oil: palm kernel oil and oil from fresh fruit bunches (FFB) (PKO). While FFB oil is frequently used in the preparation of traditional soups and stews, palm kernel oil finds a variety of uses in the food industry, cosmetics, and detergents. Again, in Nigeria, oil palm is vital to the survival of many rural farmers' livelihoods. Also, Adesiji et al. (2016) stated that oil palm is a cash crop that is extensively grown by farmers in Kogi State's rural areas. Furthermore, the socioeconomic difficulties that rural farmers have in sustaining their livelihoods are lessened by the development of oil palm, which they primarily oversee. Apart from producing income, the extraction of palm oil offers significant job prospects, hence bolstering the financial stability of rural areas. The crop also guarantees a consistent supply of food and necessary household items, improving the general standard of living for people living in rural areas.

The Nyakyusa people, who live in Malawi's Karonga District, have a long history of producing oil palm. Oil palm production is a cultural tradition that has been handed down through the decades in addition

to being an economic activity. As a fundamental component of their identity, the communities take great delight in maintaining and growing this practice. Once again, there are clear gender roles in oil palm production. Women are involved in boiling oil palm fresh fruits to obtain the lucrative oil, while men perform the physical labour of plucking oil palm fruit bunches from trees. Nevertheless, the expansion of this agricultural activity has stagnated despite its historical significance and the wealth of experience possessed by these local farmers. Concerns over the fundamental causes of stagnating this agricultural activity's advancement are raised by this study. In this study, therefore, researchers investigated the socio-economic benefits of oil palm production among these indigenous rural farmers. Further, challenges confronting indigenous rural farmers in this agricultural activity were explored. This study, was guided by the following fundamental questions; what is the importance of oil palm production to the lives of indigenous rural farmers involved in oil palm production in Karonga district, Malawi? What are the challenges confronting indigenous rural farmers? What can be done to address these challenges confronting indigenous rural farmers?

## Methodology

### Research design

Creswell and Clark's (2018) structured approach served as our guide, directing the methodical process of data collection, analysis, interpretation, and reporting. The mixed-methods approach was employed in this study. This approach combines the strengths and weaknesses inherent in both quantitative and qualitative research (Gunasekare, 2016). By adopting a mixed-methods approach, the aim was to gather rich and tangible evidence in investigating the socio-economic benefits and challenges of oil palm production rather than relying solely on quantitative or qualitative methods (Creswell and Tashakkori, 2007). Additionally, a mixed-methods approach was employed to achieve an in-depth understanding of the socio-economic benefits associated with oil palm production among these indigenous rural farmers. This choice aligns with scholarly sources such as Khatun et al. (2020), Ansah (2020), Onwuegbuzie et al. (2009), and others who highlighted the suitability of utilising the mixed method approach in research. This approach offers a wealth of information on the subject under investigation by integrating both quantitative and qualitative aspects.

In employing the mixed-methods approach, a quantitative examination of the importance of oil palm production to the livelihood of indigenous rural farmers was conducted first. This quantitative analysis then informed the qualitative inquiry on the challenges confronting oil palm production by farmers. As such, this approach allowed the gathering of diverse perspectives and viewpoints, offering multiple ways of observing and understanding what is valuable and significant in the context of oil palm production among indigenous rural farmers, as emphasised by Greene (2007). Also, the approach facilitated a practical understanding of the research problem by actively engaging respondents, participants, and discussants in dialogue.

Again, after determining the nature of the research problem and formulating our methodology, we decided to use a sequential explanatory research design. The choice of the sequential

explanatory design was rooted in the recognition that conducting an initial quantitative data analysis would offer a broad and foundational understanding of the research topic. Furthermore, the collection and analysis of qualitative data in the later stages of the study served the purpose of refining and providing explanations for the quantitative findings, particularly when delving into the perspectives of participants and discussants involved. Also, by employing sequential explanatory design, the aim was not only to validate, enhance, identify contradictions, and explore divergent viewpoints about the quantitative and qualitative data but also to uncover a more profound and nuanced understanding of the research problem (Cameron, 2009). In this context, the quantitative analysis of the importance of oil palm production to the livelihood of indigenous rural farmers was initiated first. Subsequently, a qualitative analysis of the challenges confronting oil palm production by farmers. Therefore, starting with quantitative and progressing to qualitative examination, we offered a well-rounded and multifaceted analysis of the research problem, considering both the broader quantitative trends and the intricate qualitative insights from the respondents, participants, and discussants.

## Study area, population, sample size and sampling procedure

The study was conducted in Karonga District, Malawi, especially in the northern Traditional Authority (T/A) of Mwakaboko. T/A Mwakaboko, situated in the Karonga district, shares borders with Tanzania, which affects trade and relationships within the community. Politically, T/A Mwakaboko is governed locally and nationally by the Karonga North constituency. T/A Mwakaboko was chosen because of its long history and enduring ties to oil palm production. Four communities were chosen from Traditional Authority (T/A) Mwakaboko: Mwakaboko, Nyasa, Kasewe, and Mwangulukulu. These communities were selected based on their accessibility, convenience, and respondent availability. Multi-stage sampling was used to determine the sample size. Firstly, a survey was conducted to determine the number of households involved in oil palm production. From the selected communities, it was found that 171 households in Mwakaboko, 189 in Nyasa, 167 in Kasewe, and 153 in Mwangulukulu, which totalled 680 households, were involved in oil palm production.

After the survey, a simple random technique was used to select households as respondents to answer our research questions about the socio-economic benefits of oil palm production among these indigenous rural farmers. The study's subjects were chosen from among households producing oil palm using a basic random methodology combined with the lottery method. The sample size was determined by the researchers using Slovin's method (Tejada and Punzalan, 2012), which is  $n = N/(1 + Ne^2)$ , where 'n' is the sample size, 'N' is the population size, and 'e' is the allowable margin of error. The goals, research questions, and philosophical position of the study were taken into consideration when determining the sample size (Edwards and Holland, 2013). With an allowed error margin of 0.05 and a total population of 680 households, Slovin's calculation yielded a calculated sample size of 477. As a result, 477 surveys were distributed to each of the four villages that were chosen and engaged in the cultivation of oil palm.

Purposive sampling was used to choose participants to meet the study's qualitative needs, with an emphasis on opinion leaders from selected communities, regarding the challenges confronting oil palm production by these indigenous rural farmers. Five men and three women made up the eight key informants with whom in-depth interviews were done. Furthermore, convenient sampling was employed to choose discussants, leading to four focus group discussions with 39 discussants, men and women from chosen communities involved in oil palm production. Men and women made up almost equal numbers in each focus group, with one group having slightly fewer women than the other.

## Data collection, analysis and presentation

In the course of gathering data, households engaged in the production of oil palm were given the questionnaire, which was designed by Vogt et al. (2014). The questionnaires were administered to indigenous rural farmers by four research assistants after training them. In-depth interviews that followed an interview guide were also carried out to fulfil qualitative needs. To further bolster information on the importance and difficulties of oil palm production, focus groups with indigenous rural farmers were conducted under the guidance of discussion guides. Local language translations of the questionnaires were provided (*Chichewa*). Also, in-depth interviews and focus group discussions were conducted in *Chichewa*.

Pre-tests were conducted on research instruments. Research instrument pre-testing reduced the possibility of misunderstanding by ensuring cultural relevance and sensitivity to the context of indigenous rural farmers. To facilitate effective communication, pre-testing evaluated language appropriateness, clarity, and understandability. The instrument was refined by removing, rewording, and rearranging questions to improve logical flow. It also detected potential barriers to participation and assessed the comprehension levels of discussants, participants, and respondents (Tables 1, 2).

Survey answers were combined into a dataset, and examined for errors and inconsistencies, and their accuracy was confirmed after the data was gathered by questionnaires. Then, in preparation for analysis, the dataset was coded and categorised. According to Kaur et al. (2018), descriptive statistical analysis was used to illustrate and describe the correlations between the variables in the sample, guaranteeing an organised and coherent presentation. An achievable understanding of the dataset's counts was facilitated by the utilisation of frequency measures to count instances and proportions. Correlation analysis, which was performed using IBM SPSS version 27, was used to test

TABLE 1 Selected communities for respondents for the study.

Name of community	Frequency	Percent
Mwakaboko	120	25.2
Kasewe	118	24.7
Nyasa	128	26.8
Mwangulukulu	111	23.3
Total	477	100.0

Source: Field data, 2023.

TABLE 2 Category of participants and discussants.

Source of data	Method of data collection	Number of participants
Key informants	Interview	8
Mwangulukulu village	Focus group discussion	10
Nyasa Village	Focus group discussion	10
Mwakaboko village	Focus group discussion	10
Kasewe village	Focus group discussion	9
Total		47

Source: Field data, 2023.

hypotheses. In compliance with study technique guidelines, focus group discussions and interview transcripts were sorted, transcribed, and organised (Babbie, 2012). As per Eatough and Smith's (2017) viewpoints, a thorough exploration of people's experiences was made possible by the use of the interpretive phenomenological analysis (IPA) methodology.

According to Larson-Hall and Plonsky (2015), tables were created to display quantitative data and help clarify patterns, trends, and statistical correlations. These tables offered an organised framework for identifying connections and predicted associations between variables, which enhanced the findings' accessibility and comprehensibility (Hudson, 2015). Providing a methodical framework for recognising, classifying, and interpreting emerging themes, thematic presentation was essential to the analysis of qualitative data (Sundler et al., 2019). This technique enabled a more in-depth investigation of meaning across the dataset, establishing connections between empirical results and more comprehensive theoretical models.

## Results and discussion

### Age and gender

For this study, the age range of indigenous rural farmers involved in oil palm production in the Karonga district was determined. Given the significance of this demographic characteristic for understanding the composition of respondents, it is regularly examined in research across multiple disciplines. Also, a gender analysis of the study's respondents was conducted to get crucial insights into the social dynamics and living circumstances of indigenous rural farmers. Again, the purpose of this study's gender analysis of respondents was to get crucial insights into how gender functions in social, cultural, and economic dynamics as well as to gain a deeper understanding of the distribution of male and female respondents (Doss, 2014).

Table 3 indicates that most of the indigenous rural farmers in Karonga area who produced oil palm were younger. That is to say, 47.8 percent of the respondents in this study were young, demonstrating that young people are participating in the production of oil palm, given the age range of 21–40. Getting young people involved in agriculture is essential to growing the economy. This outcome is in line with a study conducted by Zidana et al. (2020), which discovered that young people in rural Malawi have been actively engaged in agriculture as a means of subsistence. Again, the finding young people are involved in oil palm production confirms the findings of Tsitsi et al.'s (2020) study, which

indicated that young people's involvement in agriculture has decreased their inclination to relocate from rural to urban areas in Malawi.

This study, again focusing on the age range of 21–60, found that 80.3 percent of respondents were in their productive age range when it came to the labour force engaged in oil palm production. For a consistent and potentially productive labour in Malawi's rural agricultural environment, the age range of 21–60 is essential. When it comes to agricultural labour in Malawi, the concentration of these indigenous rural farmers between the ages of 21 and 60 was essential for generating oil palm, which in turn helped to strengthen their economy. The study by Adolfsson and Madsen (2020), which discovered that this demographic is crucial to maintaining livelihoods, generating income, and promoting economic growth, is supported by the results of this study. The 21–60 age group is the most productive in agriculture due to higher levels of physical strength, energy, and work capacity, all of which are essential for farming activities like the production of oil palm, according to the findings of studies conducted by McCullough (2017) and Saiyut et al. (2019).

On the analysis of gender, as shown in Table 3, this study found that of the farmers producing oil palm, 35% were women and 65% were men. The social and cultural norms that these indigenous rural farmers adhere to may be reflected in this conclusion. In light of this, concerns concerning the customary land-acquisition practise employed by these indigenous rural farmers were raised by the fact that men dominated this agricultural activity. To elaborate further on the male dominance in this agricultural activity, in the course of the interviews for this study, Nyauzedi, one of the female key informants, reported that *land belongs to the husband's side. This is the case when a woman gets married; she has to move to her husband's side. If the husband dies, the husband's side may repossess the land, leaving the woman with no place to cultivate*. This was further corroborated by Dambuyo, one of the male key informants, who said that *land access favours boys as compared to girls. When a young man marries, his parents take a portion of the land and give it to him to cultivate so that the proceeds from farming can help him take care of his family*. According to the experiences of these two key informants, Nyauzedi and Dambuyo, the land acquisition system favours men over women among these indigenous rural farmers. As narrated by Nyauzedi, the husband's family specifically owns the land. After marriage, a woman becomes a part of her husband's team. Again, Dambuyo spoke about the discrimination against men in land access as well. When a young man marries, his parents give him a portion of the land so he can farm and support his family. This finding, in turn, supports the arguments made by Kilic et al. (2015), who contend that historically, the patrilineal system has favoured men and disadvantaged women in terms of land ownership.

Again, by giving male offspring land, families ensure that young men have the means to support their own families through farming. This is implied by the comment made by the key informant, Dambuyo, which leads to financial stability. This result corroborates the findings of Meijer et al. (2015), who revealed that the husband is more likely to make economic decisions, including those about farming and other income-generating activities, in male-headed, patrilineal households in Malawi's rural agricultural landscape.

### Marital status of indigenous rural farmers

Study respondents were questioned about their marital status, never married, married, divorced, or widowed, through the



TABLE 3 Gender and age.

			Age						Total	
			21–30	31–40	41–50	51–60	61–70	71–80		81–90
Gender	Male	Count	75	97	47	41	22	22	6	310
		% of Total	15.7%	20.3%	9.9%	8.6%	4.6%	4.6%	1.3%	65.0%
	Female	Count	20	36	37	30	20	23	1	167
		% of Total	4.2%	7.5%	7.8%	6.3%	4.2%	4.8%	0.2%	35.0%
Total		Count	95	133	84	71	42	45	7	477
		% of Total	19.9%	27.9%	17.6%	14.9%	8.8%	9.4%	1.5%	100.0%

Source: Field data, 2023.

questionnaire. To get a valuable understanding of the social dynamics among these indigenous rural farmers and potential implications for this research, the marital status of the respondents was investigated.

Table 4 indicates that 76.7 percent of those who participated in the study were married. This finding showed that the production of oil palm by these indigenous rural farmers is mostly reliant on their families. According to this finding, family members had social support systems and were dependent on one another. This outcome confirms the findings of Djurfeldt et al.'s (2018) study, which revealed that most of Malawi's rural farmers are families who collaborate closely, share labour and resources, and assist one another in achieving their goals.

## Education level

Respondents to the questionnaire in this study were asked to specify their educational background because, among indigenous rural farmers, education has a big influence on development methods and interventions. Additionally, the farmers' education is a critical sign of their current knowledge and abilities. It assists in creating focused training programmes and capacity-building projects to advance agricultural practices, boost output, and implement sustainable practices (Alant and Bakare, 2021).

Table 5 displays the findings of this investigation, which indicate that 69.9% of respondents have completed basic primary education. The significant proportion of respondents who said they had completed primary school education revealed that these indigenous rural farmers had relatively easy access to formal education. This finding supports the research by Kadzamira and Rose (2003), which revealed that efforts to enhance access to and enrollment in basic schools in Malawi have been largely effective. These efforts may have contributed to higher rates of literacy and foundational knowledge among these indigenous rural farmers.

Once more, in the context of Malawi's rural agricultural landscape, the completion of primary school education for these indigenous rural farmers engaged in oil palm production in the Karonga district acted as a foundational step that allowed them to learn from others and take part in seminars and workshops aimed at enhancing their farming methods. This result supports the claims made by Phiri et al. (2019) that Malawian rural farmers, upon completion of basic primary education, possess a moderate level of knowledge and are open to modifying their farming practises because they can make well-informed decisions and pick up new techniques.

TABLE 4 Marital status of indigenous rural farmers.

			Gender		Total
			Male	Female	
Marital Status	Never married	Count	15	2	17
		% of Total	3.1%	0.5%	3.6%
	Married	Count	277	89	366
		% of Total	58.1%	18.6%	76.7%
	Divorced	Count	10	7	17
		% of Total	2.1%	1.5%	3.6%
	Widowed	Count	8	69	77
		% of Total	1.7%	14.4%	16.1%
Total		Count	310	167	477
		% of Total	65.0%	35.0%	100.0%

Source: Field data, 2023.

## Land cultivation capacity

In this study, respondents were asked to estimate the number of acres they cultivate on the questionnaire. This was the situation since land is inherited from family members and is still highly valued among indigenous rural farmers. Rural farmers invest in the land as a means of subsisting their families.

According to Table 6, the majority of indigenous rural farmers engaged in oil palm cultivation in the Karonga district cultivate one to two acres of land. In other words, 86.5 percent of those surveyed said they owned two acres or more of land. These indigenous rural farmers' cultivation of comparatively small plots of land highlighted the characteristics of Malawian rural farmers' farms. The results of this study corroborate those of Giller et al.'s (2021) study, which found that smallholder farming dominates Malawi's rural agricultural landscape and that the vast majority of rural farmers cultivate relatively small plots of land.

Also, in the course of the focus group discussion, an inquiry was made to establish the minimal cultivation of land for oil palm, and Gogo, one of the discussants from Mwakaboko village, said that *land*

TABLE 5 The education level of respondents.

			Education level				Total
			Never attended	Primary level	Secondary level	Vocational/tertiary level	
Gender	Male	Count	24	226	57	3	310
		% of Total	5.0%	47.4%	11.9%	0.6%	65.0%
	Female	Count	39	107	20	1	167
		% of Total	8.2%	22.4%	4.2%	0.2%	35.0%
Total		Count	63	333	77	4	477
		% of Total	13.2%	69.9%	16.1%	0.8%	100.0%

Source: Field data, 2023.

TABLE 6 Land size cultivated.

			Land size cultivated				Total
			1–2	3–4	5–6	7–8	
Gender	Male	Count	266	26	10	8	310
		% of Total	55.8%	5.5%	2.1%	1.7%	65.0%
	Female	Count	147	12	6	2	167
		% of Total	30.8%	2.5%	1.3%	0.4%	35.0%
Total		Count	413	38	16	10	477
		% of Total	86.5%	8.0%	3.4%	2.1%	100.0%

Source: Field data, 2023.

is shared within the family, as land is shared among family members. Gogo, the discussant, provided a viewpoint that amply demonstrated another cause requiring these indigenous rural farmers to cultivate fewer acres of land. Because family property sharing mirrored cultural and traditional customs that frequently influence how land is inherited and dispersed among families, it highlighted the importance of the customary land tenure system and led to farmers holding tiny portions of land. This result supports the research by Chirwa (2008), which found that customary land tenure influences how land is distributed among rural farmers in Malawi and that familial and generational factors are closely linked to land-holding capacity. That is, when a family grows, there is a decrease in the amount of land allocated for cultivation among family members, resulting in smaller plots of land being farmed by individual households.

## Income

Through the questionnaire, respondents were asked to indicate the income level generated through oil palm production at the household level. This was driven upon noting that farmers are involved in cooking oil production commonly known as *mawese* in their communities.

Based on Table 7, it was observed that the majority of indigenous rural farmers, 81.1 percent of the surveyed population, affirmed that their weekly earnings met or did not exceed the threshold of 10,000

Malawi kwacha. This amount equates to approximately 10 United States Dollars (US\$10). This revelation underscores a dominant economic reality within the surveyed demographic, signifying a prevalent income level that holds implications for a spectrum of socio-economic facets.

Inquiring further about what farmers are engaged in to generate income, Chinoko, one of the discussants from Mwakaboko village, narrated that *from oil palm fruits, we produce cooking oil. What happens is that we boil oil palm fresh fruits, then we sieve water to produce oil. At times we add sodium bicarbonate to produce oil so that we can make soap which we use in our houses.* Further, Mbamba, one of the discussants from Kasewe village said that *when we sell cooking oil, we get money that helps in buying basic needs for our families. Even though markets are difficult, as we trade with people from Tanzania, still we get the money that sustains our families.*

The income significance of oil palm production among rural farmers underscored the profound importance of oil palm within the fabric of rural economies. That is, oil palm production among rural farmers is key in contributing to income gains (Qaim et al., 2020). This multifaceted impact, in turn, positions oil palm as a pivotal agent in the pursuit of sustainable development and the amelioration of poverty in rural landscapes.

Further, Chinoko's account of locally boiling oil palm fresh fruits to produce cooking oil underscores the relevance of indigenous knowledge in supporting the lives of these rural farmers. As revealed by Goduka (2012), indigenous knowledge has served as an enduring and indispensable component in the preservation and sustaining of livelihood among local communities. Furthermore, the local boiling of oil palm fruits also underscored the dynamic and adaptable nature of indigenous knowledge, which exhibits a remarkable capacity to evolve and innovate in response to changing circumstances and requirements.

## Oil palm production and indigenous rural farmers' livelihood

The empirical analysis of who does (and who does not) get to use what, in what ways, and when revolves around the resource (Szaboova et al., 2020). Interrogating the importance of oil palm production for sustaining the livelihood of indigenous rural farmers was important, taking into account that these farmers have been involved in this agricultural activity since time immemorial. As such, respondents

TABLE 7 Income levels.

			Gender		Total
			Male	Female	
Weekly income	MK5,000–MK10,000	Count	251	136	387
		% of Total	52.6%	28.5%	81.1%
	MK11,000–MK20,000	Count	59	31	90
		% of Total	12.4%	6.5%	18.9%
Total		Count	310	167	477
		% of Total	65.0%	35.0%	100.0%

Source: Field data, 2023.

were asked through the questionnaire to score the benefits of oil palm production to their lives.

In examining the importance of oil palm production to livelihood, this study found that indigenous rural farmers in Karonga district involved in oil palm production shared consensus and singled out food in terms of cooking oil, income gains, employment, and meeting other basic needs.

## Oil palm as a source of food

In this study, it was found that 59.1 percent of respondents indicated that the oil palm fruits served as a source of food for their families, with 5.5 percent and 35.4 percent indicating lightly and moderately, respectively, as shown in Table 8. Such being the case, among these indigenous rural farmers in Karonga district, oil palm production can be poised to address malnutrition as indigenous rural farmers can produce cooking oil that is used in their local cuisine. This finding supports the study findings by Zant (2012) that the majority of rural farmers in Malawi, the primary goal is to produce food to meet the immediate needs of their families.

Further, in the course of focus group discussions for this study, particularly on the importance of oil palm as a source of food among these indigenous rural farmers, a further inquiry was made, and Khuku, one of the discussants from Mwangulukulu village, augmented that *from oil palms we get oil, which we use when cooking our food. The oil is nutritious and makes our bodies healthy*. From the account given by Khuku, the discussant in this study, the extraction of oil from fresh fruit bunches (FFB), serves as a means of food among these indigenous rural farmers, as the extracted oil is used to cook different kinds of food within their households. This revelation aligns with the study findings by Khatun et al. (2020) that oil palm has been a source of food in rural areas as extracted oil is used in local cuisine to make traditional soup. Going beyond the domestic use of oil extracted from oil palm fruits, this finding corroborates the study findings by Sarku (2017) in the sense that the locally extracted oil from oil palm fruits can be poised to be a foundation stage essential at the industrial level, where oil palm fruits are used for the production of cooking oil, red oil, sweetened condensed milk, margarine, emulsifiers, chocolate coatings, toffee, coffee whiteners, and whipped toppings such as cream and chocolate. Also, the finding that indigenous rural farmers in Karonga district extract oil from oil

palm fruits, and use it in their local cuisine and that the oil is nutritious as narrated by Khuku, the discussant, finds merit in the principles that were outlined at the World Summit on Food Security in 2009, which looked at food security as the consistent availability of adequate, safe, and nutritious food for all individuals to support a healthy and active life (Grainger, 2010).

Moreover, as this study has found that indigenous rural farmers in Karonga district extract oil from oil palm fruits, and serve as a source of food, it can be poised to unravel the potential synergies with the broader sustainable development goals, particularly SDG-2. That is, SDG-2 aims for zero hunger by 2030 as outlined by the United Nations (United Nations, 2015). Specifically, SDG-2, subsection 2.4, emphasised the objective of ensuring sustainable food production systems and the adoption of resilient agricultural practices. These practices aim to increase production, preserve ecosystems, build resilience to climate change and extreme weather events, such as droughts and floods, and progressively enhance land and soil quality (United Nations, 2015).

## Oil palm production and employment opportunities

In this study, it was further found that indigenous rural farmers in Karonga district have been involved in oil palm production as an occupation, through which they generate income. From Table 8, a cohort of 19.1 percent indicated lightly, while 80.9 percent indicated moderate to high that oil palm production created employment opportunities within their households. The 80.9 percent, ranging from moderate to high, indicating that oil palm production created job opportunities among these indigenous rural farmers, supports the study findings by the Malawi National Agricultural Investment Plan (NAIP) (2018), regarding the importance of agriculture in creating job opportunities among people in the rural agricultural landscape of Malawi. That is, the creation of job opportunities reflected the integration of oil palm activities into existing agricultural practices, offering additional work rather than full-time employment.

Again, in the course of the focus group discussion, with a particular focus on oil palm production creating job opportunities among indigenous rural farmers, a further inquiry was made, and Khali, one of the discussants from Kasewe village, said that *I cannot fully say that oil palm production offers solutions to jobs. But what happens is that most families headed by women hire youths to pluck fresh fruit bunches, and they are paid for that. This is a time-off job that is done when the need arises*. From the discussant's perspective, Khali, it can be deduced that while there is a perception that oil palm production created employment opportunities, the nature of these opportunities was temporary or sporadic. For instance, the hiring of youths by families, particularly those headed by women, to pluck fresh fruit bunches from oil palm trees provided once-off or short-term employment rather than permanent. This finding aligns with the study findings by Balde et al. (2019) that the establishment of oil palm plantations in rural areas of Guinea has created employment opportunities for local inhabitants, encompassing both permanent and seasonal positions. This has played a pivotal role in alleviating unemployment and poverty in rural regions.

Oil palm production offering job opportunities among indigenous rural farmers in Karonga district, can be poised to ensure the

TABLE 8 Importance of oil palm production to the lives of indigenous rural farmers.

Benefits	Lightly		Moderately		Highly	
	Total	Percent	Total	Percent	Total	Percent
Palm oil has been a source of food for my family.	26	5.5	169	35.4	282	59.1
Farmers can purchase basic needs for their households.	44	9.2	296	62.1	137	28.7
Farmers can pay for health care charges for their families.	61	12.8	296	62.1	120	25.1
Oil palm creates job opportunities for my family.	91	19.1	291	61.0	95	19.9
Palm oil proceeds help in paying educational charges.	111	23.3	264	55.3	102	21.4

Source: Field data, 2023.

achievement of sustainable development goals, particularly SDG-8, which seeks to promote decent work and economic growth. SDG-8 sub-section 8.5 emphasised the goal of achieving full and productive employment and decent work for all, including young people and individuals with disabilities, along with ensuring equal pay for work of equal value by 2030 (United Nations, 2015).

## Oil palm production and basic needs

Within the scope of this study, it was found that oil palm production played a vital role in meeting basic needs such as paying school fees for wards and medical charges among indigenous rural farmers in Karonga district. From Table 8, data revealed that 62.1 percent of respondents shared a perception of oil palm's role as a moderate, albeit notable, contributor to the fulfilment of basic needs, a perspective that reflected the complex interplay of oil palm within the socio-economic framework of their households. Further, this study found that 9.2 percent and 28.7 percent indicated that oil palm production has lightly and highly contributed to meeting basic needs, respectively. With 62.1 percent of respondents indicating that oil palm production helped these indigenous rural farmers to meet basic needs, this finding affirms the study findings of Phiri et al. (2019) on the role of agriculture being a reliable supplementary income that helps households afford necessities such as healthcare and education, in Malawi.

Augmenting on the importance of oil palm production in meeting basic needs, Mbamba, one of the male discussants from Kasewe village, said that *when we sell cooking oil and nuts, we get money that helps in buying things for our families, such as clothes. The money we get helps sustain our families.* Further, Nanthondo, one of the female discussants from Mwakaboko village, said that *we produce mawese (cooking oil), which we sell in Mbeya and Kyera. Through selling, we get little money to support ourselves.* The accounts by Nanthondo and Mbamba, the discussants, highlighted the tangible benefits by stating

that the sale of cooking oil and nuts provided money essential for meeting basic needs, such as clothes, thereby sustaining their families. The perspectives of these discussants, underlined the critical role of oil palm production, not only as a source of sustenance but also as a means of economic gains, providing these indigenous rural farmers with the financial means to meet their basic needs and improve their quality of life.

Further, independently as to whether indigenous rural farmers involved in oil palm production in Karonga district can pay medical bills and school fees for their wards from the proceeds of oil palm, this study found that 62.1 percent of respondents disclosed that the proceeds generated from their involvement in oil palm served as a means to defray their medical expenses. Also, this study found that 55.3 percent of respondents elucidated that the financial gains derived from oil palm production facilitated the fulfilment of school fee obligations for their children. With 62.1 percent and 55.3 percent of respondents indicating that oil palm production helps them to pay medical and educational charges, respectively, it underscored the importance of oil palm production in providing educational opportunities and healthy qualities, thereby contributing to the long-term socio-economic development of their households. This finding corroborates the study findings by Chowa et al. (2013) regarding the critical role of agriculture in Malawi not only in providing income but also in ensuring access to essential healthcare and education services for these indigenous rural farmers, thereby contributing to their overall wellbeing.

Moreover, in the course of interviews, Budula, one of the male key informants, emphasised that *after selling cooking oil, the realised money helps us pay school fees for our wards. At times, we use the proceeds to pay for our medical expenses when we go to private hospitals.* This emphasis that oil palm production serves as a means of meeting the educational needs of these indigenous rural farmers' wards affirms the study findings by Rafi (2018), that the progression of oil palm within rural settings, for example, in Malaysia and Indonesia, has created a conducive environment for farmers and their offspring to access educational opportunities.



Oil palm production among indigenous rural farmers in Karonga district can be poised as a means of poverty alleviation, as these indigenous rural farmers can meet some of their basic needs. That is, as farmers can generate income and meet some of the basic needs for their families, oil palm production can be poised as a mitigation to poverty alleviation among these indigenous rural farmers. This assertion aligns with the study findings by [Benoit \(2022\)](#) and [Adebo et al. \(2015\)](#), that oil palm production has contributed to poverty alleviation with an estimation of 5.3 percent in Rumonge, Burundi, and has been a major vocation, playing a significant role in poverty alleviation in Ekiti State, Nigeria, respectively.

## Correlation analysis of acres of land cultivated and benefits from oil palm production

The researcher hypothesised that there is a relationship between acres of land cultivated and the benefits households accrue from oil palm production. The anticipation was that the more acres of land cultivated by households, the greater the likelihood that households would gain benefits such as food, income, and increased job opportunities.

From [Table 9](#), a Pearson correlation coefficient value of  $-0.195$  was observed between acres of land and benefits from oil palm production among indigenous rural farmers in Karonga district, indicating a moderately negative correlation. This finding suggested that as the number of acres of land cultivated by households increased, there was a tendency for benefits from oil palm production to decrease. Also, a significance value (sig) of 0.000 was observed, revealing that this correlation is statistically significant. This finding contradicted the normal situation as far as oil palm production is concerned. That is, most of the time, rural farmers are engaged in agricultural activity that brings forth benefits and sustains their lives by looking at social and economic viability. As such, this finding contradicted the study findings by [Syahza et al. \(2015\)](#) that the increase in land cultivated for oil palm has an effect that can be seen from the increase in farmers' incomes, hence increasing the purchasing power of the indigenous rural farmers for both primary and secondary needs. This unexpected result implied that in Karonga district, larger landholdings may not necessarily translate to greater benefits, potentially due to other challenges, worth exploring.

TABLE 9 Acres of land cultivated and benefits of oil palm production.

		Benefits of oil palm production
Number of acres	Pearson correlation	$-0.195^{**}$
	Sig. (2-tailed)	0.000
	N	477

Source: Data field, 2023.

## Challenges affecting oil palm production

In exploring challenges that confront indigenous rural farmers involved in oil palm production in Karonga district, the following were identified as challenges.

### Limited market access

This study found that indigenous rural farmers involved in oil palm production in Karonga district have limited market access. Commenting on limited access to markets as a challenge, Namoyo, one of the female discussants from Mwakaboko village, complained *that there are no markets within our communities. We rely on markets in Kyera or Mbeya, Tanzania. At times, traders from Tanzania come to buy oil from us, and the problem is that they set prices for us.* Further, Nagama, one of the discussants from Mwangulukulu, highlighted the heightened effects of limited market access by saying that, *due to market problems, we rely on traders from Tanzania who come to buy oil. Traders determine the price, which makes us not realise the many benefits of oil palm production.* From the accounts provided by the discussants in this study, particularly Namoyo, and Nagama, it emerged that the dearth of a well-established market has left these indigenous rural farmers dependent on traders or intermediaries to sell their oil palm products. The adverse of limited market access lead to unfair pricing, exploitation, and loss of income for farmers, as middlemen often have greater bargaining power and control over market transactions. This finding aligns with the study findings by [Abebe et al. \(2016\)](#), and [Ochieng et al. \(2020\)](#) that the unavailability of readily available markets disadvantages rural farmers and impedes their ability to realise optimal benefits from their agricultural endeavours. Farmers grappling with this challenge find themselves in a disadvantaged position when negotiating favourable terms for their agricultural produce. As a result, the repercussions extend beyond immediate financial implications to influence the overall sustainability and prosperity of their agricultural activities.

Again, the reliance on traders who come to buy oil palm products, and that they determine the prices, as narrated by Nagama, the discussant, has left these indigenous rural farmers in Karonga district struggling to generate more income. This is the case as these indigenous rural farmers do not have the bargaining power to set prices, hence being exploited and unable to fully benefit from oil palm production. This finding aligns with the study findings by [Derembwe \(2015\)](#) that limited market access exposes farmers to the volatile nature of prices. Limited market access leaves farmers susceptible to exploitative practices by stronger market players, such as traders, further diminishing their share of the benefits derived from oil palm production.

Inquiring what can be done to address the challenge of limited market access, Kaguka, one of the male key informants, said that *I wish our government, through the Ministry of Agriculture, could help us by opening markets around our communities. Moreover, we have companies in the country that produce cooking oil. I think these companies should support us by buying palm oil.* Kaguka, the key informant in this study's account, suggested that local companies that produce cooking oil should support farmers by purchasing their produce. This also indicated a desire for collaboration between the government, private sector, and indigenous rural farmers to improve market access and create opportunities for selling oil palm products locally.

### Limited farm equipment and machinery

In this study, it was found that indigenous rural farmers involved in oil palm production in Karonga district have limited farm equipment and machinery that could mediate in realising more benefits from this agricultural activity. Testimonies from these indigenous rural farmers in Karonga district underscored the deficiency in farm equipment and machinery. For instance, Maduku, one of the female discussants from Kasewe village, complained that *some of the challenges that we face as farmers are related to a lack of equipment that can promote our farming. As you can see, oil palm trees are tall, and harvesting fruits becomes difficult. This makes our farming difficult and makes it hard to realise potential benefits. Moreover, the way we produce cooking oil is traditionalistic, such that we do not produce more cooking oil.* Similarly, Chitunda, one of the male discussants from Mwakaboko village, reported that, *as farmers who have been involved in oil palm production for a long time, we do not have machines and other equipment that can help in our farming. As you can see, palm trees are tall, and extracting fresh fruits becomes difficult for us.*

The testimonies provided by the discussants in this study, particularly Maduku, and Chitunda, illuminated the tangible obstacles hindering production and profitability from oil palm production among these indigenous rural farmers. For instance, Maduku, the discussant, underscored how the labour-intensive nature of harvesting oil palm fruits and processing cooking oil is compounded by the absence of equipment, impeding farming efforts and compromising the quality of the produced oil. Similarly, Chitunda, the discussant, lamented the absence of equipment to aid in oil palm production, emphasising the difficulty in extracting fresh fruits from oil palm trees. These obstacles hinder the optimal realisation of benefits from this agricultural activity among these indigenous rural farmers. This finding corroborates the study findings by [Rodthong et al. \(2020\)](#) regarding the profound obstacle faced by rural farmers, indicating that the absence of equipment not only limits production efficiency but also restricts rural farmers' ability to capitalise on the economic viability of oil palm.

### Limited access to credit

In this study, it was further found that these indigenous rural farmers have limited access to credit as participants and discussants highlighted a significant barrier to oil palm production among indigenous farmers, which in turn negatively impacts the realisation of benefits from this agricultural activity as these farmers cannot ably invest or buy equipment that can help in their farming endeavours. Commenting on limited access to credit during the focus group discussion, Gada, one of the discussants from Mwakaboko village, complained that, *as farmers, we face challenges related to access to credit in terms of loans.* Further, Chiguwo, one of the male key informants, complained that *a lack of credit and loans for us farmers is bringing back the cultivation of oil palm among farmers.* The testimonies provided by Gada, the discussant, and Chiguwo, the key informant from the study area, emphasised the adverse effects of limited access to credit. For instance, Chiguwo's statement underscored the direct impact of limited access to credit on the cultivation of oil palm among farmers, indicating that it inhibits their ability to engage in oil palm production effectively. This finding aligns with the study findings by [Lindsjö et al. \(2021\)](#), and [Tambi et al. \(2021\)](#) on the profound challenges regarding limited access to credit, stipulating that inability

for rural farmers to access credit inhibits rural farmers to invest in inputs, equipment, and technology necessary for increased production and improving the quality of their produce. Further, this finding aligns with the study findings by [Salima et al. \(2023\)](#), and [Allie and Demiryürek \(2020\)](#), that the rural agricultural landscape of Malawi, limited access to credit has far-reaching implications, affecting the overall agricultural production and economic stability of farming communities, including the inability to invest in farm inputs, hindered adoption of modern farm equipment, and farm expansion among rural farmers.

Inquiring whether there are micro-finance institutions that help these indigenous rural farmers with loans, Maduku, the female discussant from Kasewe village, said that *there is no company or organisation that helps us with loans. Even the Malawi Ministry of Agriculture does not provide us with any financial support, we rely on our own.* Maduku's account underscored the extent to which these farmers depend on their limited personal savings and resources to finance their agricultural operations. This reliance on personal capital significantly constrains their ability to scale up production and purchase necessary inputs, including farm equipment. Again, the Malawi Ministry of Agriculture does not provide financial support to these farmers, this suggests a lack of government intervention or programmes aimed at facilitating access to credit for oil palm production. This finding affirms the study findings by [Allie and Demiryürek \(2020\)](#) that within the rural agricultural landscape of Malawi, limited access to credit constrains rural farmers in terms of buying seedlings, fertilisers, and pesticides that are important for the success of any agricultural activity.

Inquiring what can be done so that these farmers can have access to credit, Maduku, the female discussants from Kasewe village, said that *if there can be intervention from the government or any other organisation that can help us with small loans so that we can invest in oil palm production, we may be getting more benefits.* Maduku, a female discussant from Kasewe village, highlighted the significant potential for improving oil palm production through financial support. She emphasized that if the government or other organisations could provide small loans to farmers, it would enable them to invest more effectively in oil palm cultivation. This investment could lead to increased productivity and subsequently greater benefits for the farmers. Again, Maduku's statement underscored the critical role of financial assistance in enhancing agricultural activities and the economic wellbeing of these indigenous rural farmers, suggesting that access to credit could be a key driver for improving agricultural output, hence benefiting from this agricultural activity. This finding aligns with the study findings by [Bronkhorst et al. \(2017\)](#) and [Alwarritzi et al. \(2016\)](#) that the provision of credit to rural farmers in countries such as Indonesia and Malaysia has facilitated the growth and expansion of oil palm production. This has enabled rural farmers to acquire agricultural inputs such as improved seedlings, fertilisers, pesticides, and farm equipment, which are vital for the optimisation of benefits from oil palm production.

### Limited access to information

In this, it was found that among indigenous rural farmers engaged in oil palm production, a significant challenge arises from limited access to information. Emphasising limited access to information, in the course of focus group discussions, Kilifi, the discussant from

Mwangulukulu village, said that *farmers involved in oil palm production hardly have information or extension services from the government or any other organisation. This impedes our farming practices.* Further, stressing the limited access to information, Dodolido, the discussant from Nyasa village, narrated that *since we started farming, there has not been a single day an extension service worker has come to teach us the best farming practices to promote our farming.*

The accounts given, particularly by Kilifi, the discussant, underscored how the absence of vital information hampers farming practices, indicating a critical gap in knowledge dissemination and agricultural extension services. Limited access to information has rendered these indigenous rural farmers grappling with best farming practices. Similarly, Dodolido, the discussant, emphasised the necessity of extension services to provide information on effective farming practices, lamenting the apparent neglect in this regard. This limited access to information among these indigenous rural farmers negatively affects their farming practices as they do not have vital information that can shape the best farming methods regarding oil palm. As a result, these farmers do not realise many benefits from this agricultural activity. This finding aligns with the study findings by MacIvor (2019) that limited access to information not only impedes the optimisation of benefits from oil palm production but also inhibits farmers' ability to adopt best practices and enhance production.

Going beyond, it can be deduced that access to information does not only negatively affect these indigenous rural farmers with best practice methods but also potentially market information. That is, the fact that these indigenous rural farmers have limited access to information from relevant stakeholders, would further limit their access to market information, hence failing to know and make informed decisions about when and where to sell their oil palm produce. This assertion aligns with the study finding by Phiri et al. (2019), that the provision of information to rural farmers in Malawi helps them make informed decisions about when and where to sell their agricultural produce. This ensures a better economic return and helps rural farmers plan their sales more strategically.

Inquiring what can be done to address the challenge of limited access to information among these indigenous rural farmers in Karonga district, Nyatembo, one of the female discussants from Mwakaboko village, said that *if the relevant authorities can help us with extension services, even if it would be in forms of training or workshops, that would help us to farm better.* Nyatembo, the discussant, stressed the importance of extension services in improving farming practices. She suggested that if relevant authorities could provide support through training sessions or workshops, it would greatly enhance the farmers' abilities to cultivate their land more effectively. This type of assistance would empower these indigenous rural farmers with the necessary knowledge and skills to adopt better farming techniques regarding oil palm, hence benefiting from their agricultural endeavour. This revealed the absence of technical training and capacity-building initiatives tailored to these indigenous rural farmers. This finding corroborates the study findings by Lee et al. (2014), that most of the rural farmers involved in small-scale production face multiple challenges, including limited access to agricultural workshops and training tailored towards improving farming practices.

## Conclusion

From this study, it can be concluded that the investigation of socio-economic benefits and challenges of oil palm production among indigenous rural farmers in Karonga District, Malawi, revealed a multifaceted role in addressing food through cooking oil production, creating employment opportunities, and mitigating social challenges. Despite its potential benefits, challenges such as limited access to markets, farm equipment and machinery, credit, information, and extension services persisted, hindering production and socioeconomic progress. The Malawi Ministry of Agriculture plays a vital role in driving agricultural development but needs to prioritise emerging crops like oil palm and address existing hurdles through collaborative efforts at both district and national levels.

## Recommendations

This study recommends that the Malawi Ministry of Agriculture should mobilise and collaborate with other stakeholders in the agriculture sector and manufacturing industry to promote oil palm production. The collaboration efforts between the MoA and other stakeholders in the agriculture sector and the manufacturing industry will boost farming activity as farmers will have readily available markets, hence lessening market access challenges and leading to the realisation of potential benefits from oil palm production. Again, Secondly, the Malawi Ministry of Agriculture should provide extension services to indigenous rural farmers involved in oil palm production. The provision of extension services will ensure that farmers have access to information regarding best farming practices, including market access information. This will not only boost agricultural activity but also bridge the knowledge gap among farmers regarding farming practices. Also, finance institutions working within the agriculture sector should extend and provide indigenous rural farmers involved in oil palm production with credit facilities. This will not only lessen limited access to credit but also allow farmers to invest in this agriculture activity to buy equipment (and other farm equipment) that will enable them to realise benefits from oil palm.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

## Ethics statement

The studies involving humans were approved by Malawi University of Science and Technology Research Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.



## Author contributions

NM: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. AO: Formal analysis, Methodology, Supervision, Validation, Writing – review & editing, Writing – original draft. JA: Formal analysis, Methodology, Supervision, Validation, Writing – review & editing, Writing – original draft.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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