International Journal of Applied Research in Business and Management (ISSN: 2700-8983)
an Open Access journal by Wohllebe & Ross Publishing, Germany.
Volume: 06 Issue: 02 Year: 2025
https://doi.org/10.51137/wrp.ijarbm.2025.aoec.45836

Economic Viability and Challenges of Small-scale Cannabis Farming in the Eastern Cape, South Africa

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Abstract:

Cannabis farming is a vital economic activity in the Eastern Cape, South Africa, where small-scale farmers have cultivated the crop for generations. This study examines the economic viability and challenges they face, considering global trends and local market conditions. While the global cannabis industry is expanding, smallholder farmers in South Africa remain excluded from formal markets due to regulatory barriers, financial constraints, and limited market access. Using a qualitative approach, the study conducted semi-structured interviews with 15 small-scale farmers to explore their experiences and challenges. The findings indicate that small-scale cannabis farmers face multiple obstacles, including lack of access to formal markets, high compliance costs, theft, and climate-related risks. Despite government projections that the cannabis sector could contribute R28 billion to the economy and create thousands of jobs, many farmers struggle to secure licenses, financial assistance, and quality farming inputs. The study highlights the need for inclusive policy reforms, including simplified licensing, cooperative farming structures, and financial support mechanisms, to enable small-scale farmers to compete effectively in the legal cannabis economy.

Keywords:

Agricultural Finance, Cannabis Farming, Cannabis Legalisation, Market Access, Socioeconomic Development

Submitted: 2025-04-19. Revised: 2025-04-28. Accepted: 2025-05-08.

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Introduction

The cannabis industry's growth has translated into substantial employment gains. Over 440,000 full-time jobs are now supported by the legal cannabis sector (primarily in North America), and policymakers tout cannabis as a catalyst for rural job creation (Flowhub, 2025). Yet, market trends also pose challenges. Oversupply in mature markets has driven down prices, squeezing profit margins (Flowhub, 2025). Notably, average retail cannabis prices fell by over 30% from 2021 to 2023 in major markets, pressuring smaller growers (Malkani et al., 2021). As the accompanying price index shows, this price compression forces consolidation and favours large-scale producers (Liddle, 2024). High compliance costs and stringent regulations further erode the viability of small farms, undercutting the promise of broad-based economic gains (Grooten & Eade, 2023).

In South Africa, cannabis has historically served as a subsistence crop for many rural communities, especially in provinces such as the Eastern Cape. Despite the government's efforts to promote industrialisation and job creation through cannabis legalisation, small-scale farmers remain largely marginalised. Manganyi et al. (2024) highlight that high regulatory barriers, limited market access, and inadequate financial support restrict their ability to benefit from the emerging formal economy.

This paper investigates the lived experiences of small-scale cannabis farmers in the Eastern Cape and the structural challenges that affect their participation in the legal cannabis market. Understanding these dynamics is essential for informing inclusive agricultural policies and unlocking the socio-economic potential of cannabis in South Africa. The paper aims to assess the economic viability of small-scale cannabis farming and identify the key challenges they face.

Origin and History of Cannabis

Cannabis originated in Central Asia, specifically Mongolia and southern Siberia, where it was cultivated for both industrial and psychoactive purposes as early as 12,000 years ago (Simiyu et al., 2022; Warf, 2014). It spread to the Middle East, Eastern Europe, and India around 3000 years ago, where it was used medicinally and in religious practices (Klumpers & Thacker, 2019; McClain, 2016). In the 1300s, Arab traders introduced Cannabis to Africa through the Red Sea, where it became integrated into traditional rituals and medicinal treatments (Mhlongo & Van Wyk, 2019; Arkell et al., 2023). By the 16th century, the plant reached South America via the transatlantic slave trade, particularly through Angola to Brazil, and subsequently spread to Colombia, Mexico, and North America (Borougerdi, 2018; Duvall, 2019). In North America, Cannabis gained popularity primarily for recreational use among lower-income communities, while its medicinal properties were formally documented by William O'Shaughnessy in 1839 (Osterberger et al., 2022; Booth, 2015).

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In Africa, the use of Cannabis diversified over time; initially smoked recreationally, it was later employed for medicinal and textile purposes (Duvall, 2019; Booth, 2015). By the 1790s, Mozambican farmers cultivated it mainly for its medicinal inflorescences and leaves, while North African farmers utilised hemp for textile production (Duvall, 2019). In South Africa, Cannabis was introduced between the 1500s and 1700s by Portuguese sailors and was initially grown on a small scale for cultural, ritualistic, and recreational uses (Warf, 2014; Bloomer, 2019). However, the legalisation of Cannabis in September 2018 significantly expanded its cultivation for export, medicinal research, and broader recreational consumption (Van Rensburg et al., 2019).

Cannabis Farming in South Africa

In South Africa, cannabis (locally “dagga”) has long been a critical informal crop. The country is among the world’s top producers, with an estimated 900,000 small-scale farmers (especially in the Eastern Cape’s Mpondoland and KwaZulu-Natal) growing cannabis for livelihoods (Ndlangamandla et al., 2024). Many rural households depend on this crop, earning modest incomes (for example, ZAR 2,800 per month, US$150 in a good season) from local sales (Ndlangamandla et al., 2024). Recent legal developments, such as the 2018 decriminalisation of private use, spurred hopes of integrating these traditional growers into a lucrative formal market (Dube et al., 2023). Government plans project the industry could be a “R28 billion” (US$1.5 bn) game-changer, creating 10,000–25,000 jobs (Thorne, 2024).

Regulatory barriers, however, impede this transition. Commercial cultivation in South Africa currently requires expensive licensing (SAHPRA for medical cannabis), which most smallholders cannot afford (Ndlangamandla et al., 2024). As a result, legacy farmers remain excluded from legal value chains, even as high-grade strains and corporate entrants capture emerging markets. Small-scale growers risk losing their economic foothold without inclusive policies such as simplified licensing, technical support, and market access for small producers in the Eastern Cape (Dube et al., 2023). Conversely, empowering these traditional farmers can drive rural development, preserve indigenous cannabis genetics, and ensure that the “green gold” boom delivers shared prosperity (Thorne, 2024).

Small-scale farmers, who have historically operated outside formal regulatory frameworks, now face the complexities of licensing, compliance with agricultural standards, and integration into broader value chains. However, initiatives have been launched to provide proper licensing and distribution of hemp seeds to these farmers, ensuring their inclusion in the formal market (SABC News, 2025). A notable initiative includes a R1 billion investment by Medigrow and the Coega Special Economic Zone in Gqeberha, aiming to establish an indoor cannabis cultivation facility (Bugan, 2025). This project encompasses various operations such as cannabidiol extraction, packaging, and cigarette manufacturing and is projected to create job opportunities upon full implementation (SABC News, 2025).

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Such developments underscore the province's ambition to position itself as a central hub in South Africa's burgeoning cannabis sector.

Literature Review

Cannabis Farming and its Economic Significance

Cannabis cultivation has emerged as a significant economic driver in various regions, contributing to job creation, tax revenue, and broader economic development. In the United States, for instance, the cannabis industry has experienced substantial growth, with projections indicating that it could add nearly $100 billion to the economy by 2030 (Kapur, 2024). This expansion encompasses various sectors, including cultivation, processing, distribution, and retail, thereby creating a diverse array of employment opportunities.

The economic benefits of cannabis farming extend beyond direct financial gains. Legalisation and regulation have enabled governments to generate significant tax revenues, which can be allocated to public services and infrastructure projects. For example, in 2020, state and local governments in the U.S. earned over $3 billion in tax revenue from cannabis sales (Kilmer et al., 2021). Additionally, the formalisation of the cannabis market has led to increased demand for ancillary services such as security, marketing, and legal expertise, further stimulating economic activity (Hall & Lynskey, 2021).

Legalising cannabis has enormous financial advantages for state governments as well as social services and initiatives. Governments can tax cannabis sales and reap economic benefits by generating thousands of new employment and revenue through the establishment of regulated adult cannabis markets. In 2024, the US federal government collected a total revenue of $19,453,652,463 from cannabis sales (MPP, 2024). This indicates that governments can now collect revenue from cannabis traders, which was difficult when the substance was illegal. In addition, legalising cannabis for adult use eliminates the illegal market and allows law enforcement to concentrate on higher-level crimes.

However, the economic impact of cannabis farming is not uniformly positive and can vary based on regulatory frameworks and market dynamics. Some studies suggest that the anticipated economic gains may be concentrated in specific sectors or regions, potentially leading to disparities (CRS Reports, 2023). Moreover, the nascent nature of the industry presents challenges in accurately assessing its long-term economic contributions. Therefore, while cannabis farming holds considerable economic promise, it is essential to implement balanced policies that maximise benefits while mitigating potential adverse effects.

The cannabis farming market in South Africa is anticipated to achieve a revenue of US$42.2 million by 2030, with a projected compound annual growth rate of 18.3% between 2025 and 2030 (Grand View

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Research, 2024). The cannabis industry in South Africa has experienced notable growth in recent years, with projections indicating a continuation of this trend. According to the Department of Trade, Industry and Competition, the cultivation and commercialisation of cannabis in South Africa are estimated to create between 10,000 to 25,000 jobs across the sector (DTIC, 2022). Cultivation sites often require a substantial workforce, including horticulturists, technicians, administrators, and security personnel, thereby contributing to local economic development (The National Cannabis Industry Association, 2023). Additionally, the industry's growth has spurred demand for ancillary services such as legal expertise, marketing, and security solutions, further stimulating economic activity in related sectors.

Sustainable Farming Practices in Cannabis Cultivation

Sustainable farming practices in cannabis cultivation are increasingly recognised as essential for reducing the environmental impact of the industry. Traditional cannabis farming methods, particularly those involving indoor cultivation, have been criticised for their excessive energy consumption and high carbon footprint (Mills & Zeramby, 2021). Furthermore, the use of chemical fertilisers and pesticides can degrade soil health and contribute to water contamination (Baweja et al., 2020). To mitigate these challenges, sustainable approaches such as organic farming, regenerative agriculture, and resource-efficient technologies are being adopted to enhance the long-term viability of cannabis production while minimising ecological harm.

One key aspect of sustainable cannabis farming is the adoption of organic cultivation methods, which emphasise soil health and biodiversity. Organic fertilisers, such as compost and manure, not only provide essential nutrients but also improve soil structure and microbial activity (Lydon et al., 1987; Singh et al., 2020). Additionally, integrated pest management (IPM) strategies, including companion planting and the use of beneficial insects, reduce reliance on synthetic pesticides that can harm beneficial organisms and disrupt ecosystems (Clarke & Merlin, 2016). These practices align with the principles of regenerative agriculture, which seek to restore soil fertility and promote biodiversity through natural cycles of growth and decomposition.

Water conservation is another critical component of sustainable cannabis farming. Conventional irrigation methods often lead to excessive water use and runoff, exacerbating water scarcity issues in drought-prone regions (Kroeger et al., 2020). Sustainable alternatives, such as drip irrigation and rainwater harvesting, enable precise water delivery while minimising waste and soil erosion (Rodriguez-Sinobas et al., 2021). Moreover, the transition to outdoor or greenhouse cultivation, where natural rainfall and humidity can supplement irrigation needs, significantly reduces water and energy demands compared to indoor facilities that require artificial lighting and climate control (Mills & Zeramby, 2021). Such measures not only decrease the environmental impact of cannabis farming but also enhance its economic efficiency by lowering operational costs.

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Implementing sustainable practices in cannabis cultivation is crucial for ensuring the industry's long-term environmental and economic viability. By prioritising organic farming techniques, improving water management, and reducing energy consumption, cannabis growers can contribute to a more sustainable agricultural system while maintaining high-quality production standards (Carah et al., 2015). However, achieving widespread adoption of these methods requires supportive policies, industry incentives, and consumer awareness (Carah et al., 2015). As sustainability becomes a defining factor in agricultural practices worldwide, integrating environmentally responsible approaches into cannabis cultivation will be essential for balancing profitability with ecological stewardship.

The Role of Cooperatives and Support Systems in Small-scale Agriculture

Cooperatives facilitate collective action among small-scale farmers, enabling them to confront production risks and market uncertainties more effectively. For instance, Gutiérrez (2014) highlight that small-scale farmers in Colombia view informal groups as a strategic alternative for managing risks, particularly in the face of covariate shocks. This collective approach not only aids in risk management but also fosters innovation and enhances community competitiveness, which is essential for increasing income levels among smallholders. Furthermore, the establishment of cooperatives can lead to economies of scale, allowing farmers to access modern agricultural technologies and inputs that would otherwise be unaffordable (Wang et al., 2021).

Support systems, including government policies and agricultural development programs, play a crucial role in bolstering the effectiveness of cooperatives. For example, Machum (2015) discusses how organisations like Via Campesina advocate for small-scale food production that aligns with local needs, contrasting with the dominant corporate agricultural models that prioritise large-scale industrial farming. This advocacy is vital for shaping policies that recognise and support the unique contributions of small-scale agriculture to food security and rural development. Additionally, supportive policy environments are necessary to provide smallholders with the technological and market access needed for sustainable intensification (Samberg et al., 2016).

The resilience of small-scale agriculture is further enhanced through targeted support systems that address specific challenges faced by these farmers. Tudor emphasises that small-scale agriculture must adapt to the evolving global landscape, necessitating investments in new capabilities and resilience strategies (Tudor, 2015). This adaptability is crucial for smallholders to navigate the complexities of modern agricultural demands and environmental changes. Moreover, the integration of agricultural cooperatives into broader economic frameworks can stimulate rural economies by creating jobs and enhancing food security (Mbatha & Masuku, 2018).

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Methods and Data

This qualitative study employed semi-structured interviews to explore the experiences of 15 small-scale cannabis farmers in the Eastern Cape, South Africa. Participants were selected through purposive sampling, ensuring they had relevant experience and were willing to share their insights. Semi-structured interviews were chosen to allow for in-depth exploration of participants' perspectives while providing flexibility to probe emerging topics. This approach aligns with qualitative research methodologies that seek to understand complex social phenomena from the participants' viewpoints (Creswell & Poth, 2018).

Data collection involved conducting interviews in participants' local settings to ensure comfort and authenticity in responses. Each interview lasted approximately 45 to 60 minutes and was audio-recorded with consent. The recordings were transcribed verbatim for analysis. Thematic analysis was employed to identify patterns and themes within the data, following the six-phase framework (Braun & Clarke, 2006). This method facilitated a systematic examination of the data, allowing for the emergence of nuanced insights into the economic viability and challenges faced by these farmers. Ethical considerations, including informed consent, confidentiality, and the right to withdraw, were strictly adhered to throughout the research process, ensuring the study's integrity and the protection of participants' rights.

The interviews were guided by a semi-structured interview schedule, consisting of open-ended questions covering farming practices, economic challenges, market access, and regulatory experiences. The semi-structured format allowed participants to express themselves freely while enabling the researcher to explore emerging issues in greater depth (Adams, 2015). One of the advantages of semi-structured interviews is their flexibility, which permits adaptation to the participant’s context and the pursuit of unanticipated but relevant topics (Kallio et al., 2016). However, a noted disadvantage is the potential for inconsistency between interviews, as the open-ended nature may lead to varying emphases across participants (Bryman, 2016). Nonetheless, the use of semi-structured interviews was deemed appropriate for capturing the complex, context-specific experiences of small-scale cannabis farmers.

Results and Discussion

The word cloud illustrates the key challenges and opportunities for small-scale cannabis farmers in the Eastern Cape, with larger words representing those terms mentioned most frequently.

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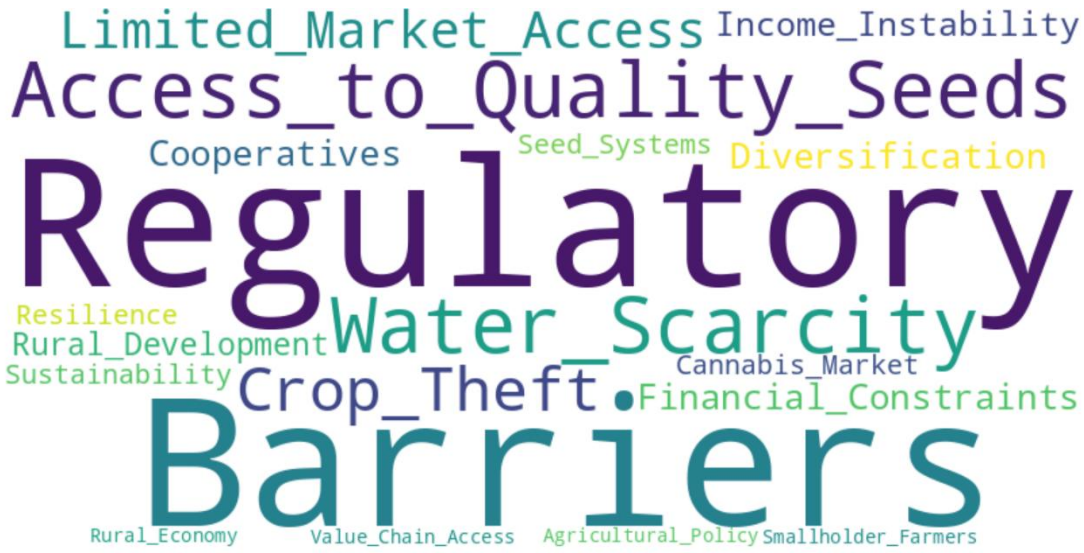

Figure 1: Word cloud

Farming Practices and Production Methods

Soil Preparation and Farming Techniques

Many farmers in the Eastern Cape rely on traditional methods of soil preparation, with a significant number using manure as a natural fertiliser. The responses indicate that compost from animal kraals is a common practice due to its accessibility and cost-effectiveness. As one farmer explained, *"I use manure from my cattle because it helps my plants grow strong, and I do not have money for chemical fertilisers."* ***(P#8)***

Farmers still use traditional techniques to prepare the soil, like using manure as a natural fertilizer. The importance of composting as a manure management strategy is also supported by findings that indicate composting can effectively reduce harmful residues while improving soil quality (Qiu et al., 2022). This is relevant for farmers who may be concerned about the sustainability and safety of their farming practices. Additionally, the meta-analysis by Zhang et al. (2019) reveals that replacing synthetic fertilizers with animal manures can lead to lower greenhouse gas emissions and improved soil health.

Moreover, the findings of Momberg et al. (2023) highlight that kraal, or animal enclosures, can significantly increase soil carbon and fertility across various biomes. This is particularly relevant as farmers in the Eastern Cape utilise kraal manure, which contributes to enhanced soil structure and nutrient content. The study also indicates that the duration of kraal use and animal density can affect soil recovery and fertility, reinforcing the importance of traditional practices in sustainable farming.

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Seed Selection and Planting Methods

Farmers utilise a combination of local and crossbred cannabis seeds, with some preferring 'pest-resistant' varieties to mitigate losses. A respondent shared, *"I mix different seeds to improve the quality and quantity of my harvest, but it is difficult to access high-quality seeds in our area."* ***(P#10)***

The lack of formalised seed distribution channels means that most farmers rely on local exchanges or previous harvests to secure seeds for the next planting season. The practice of mixing different seeds, often referred to as intercropping or polyculture, is a common strategy among small-scale farmers to enhance both the quality and quantity of their harvests. This method is relevant in regions where access to high-quality seeds is limited, as it allows farmers to optimise their production using available resources. The challenges associated with seed quality and accessibility are well-documented in recent agricultural literature. Altieri et al. (2021) emphasise that mixing different seed varieties can lead to increased biodiversity, which in turn enhances ecosystem resilience and crop yields. The authors argue that diverse cropping systems can mitigate risks associated with pests and diseases, ultimately leading to more stable harvests. This aligns with the participant's assertion that mixing seeds improves harvest quality and quantity, particularly in the face of limited access to high-quality seeds.

The issue of seed accessibility is a significant barrier for smallholder farmers, particularly in developing regions. According to Hlatshwayo et al. (2021), many small-scale farmers face challenges in obtaining high-quality seeds due to market constraints, lack of information, and limited availability of seed varieties. The authors suggest that enhancing local seed systems and promoting seed exchange networks can improve access to quality seeds, which is crucial for farmers aiming to improve their crop production. Zhang et al. (2022) found that intercropping systems often yield higher total biomass and better resource use efficiency compared to monocultures.

Irrigation Practices and Water Access

Water scarcity remains a pressing challenge, with many farmers relying on rain-fed irrigation. The majority of respondents indicated they do not have any formal irrigation system. One farmer lamented.

"When there is no rain, we cannot plant. We just wait and hope for the best." ***(P#13)***

This dependency on rainfall exposes farmers to the risks of prolonged droughts and unpredictable weather patterns. The reliance on rainfall for agricultural practices in regions with limited irrigation infrastructure is a significant challenge for small-scale farmers. The statement "When there is no rain, we cannot plant. We just wait and hope for the best" reflects the vulnerability of agricultural systems to climatic variability.

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Lobell et al. (2014) found that in regions where farmers depend heavily on rain-fed agriculture, such as the Eastern Cape, fluctuations in rainfall can lead to significant reductions in crop yields. This aligns with the participant's experience of waiting for rain before planting, as the timing and amount of rainfall directly influence planting decisions. Mastrorillo et al. (2016) examine the adaptive strategies employed by smallholder farmers in response to changing climatic conditions. The study highlights that many farmers adopt a wait-and-see approach during periods of drought, as they lack the resources to implement alternative irrigation methods. This behaviour is consistent with the participants' statement about waiting and hoping for rain, underscoring the need for more resilient agricultural practices. Mutengwa et al. (2023) suggest that building social networks and support systems can help farmers cope with the uncertainties of rainfall-dependent agriculture. This highlights the importance of community resilience in the face of climate variability. Communities may share resources, information, and strategies to better manage the risks associated with drought.

Fertilisation and Pest Control Strategies

Most farmers manage pests through natural means, avoiding chemical pesticides due to cost constraints and concerns over crop safety. Composting is a widely adopted practice, and as one farmer stated,

"I use compost because it keeps my plants healthy, and it is better for the soil in the long run." ***(P#9)***

However, several farmers expressed frustration with increased pest attacks, with one participant noting, *"Pests are becoming a bigger problem. Without proper pesticides, we lose a lot of our crop."* ***(P#14)***

Composting is widely recognised for its ability to enhance soil fertility and structure. According to Neher et al. (2022), the application of compost improves soil organic matter, enhances microbial activity, and increases nutrient availability, which collectively contribute to healthier plants. The authors emphasise that compost not only provides essential nutrients but also improves soil aeration and water retention, leading to better plant growth. The use of compost significantly increases soil carbon content and improves soil structure over time (Zhang et al., 2019). This aligns with the farmer's statement that compost is better for the soil in the long run, as it contributes to sustainable soil management practices that enhance productivity and resilience. Moreover, Neher et al. (2022) indicates that compost can suppress certain soil-borne diseases due to the presence of beneficial microorganisms. This aspect of composting is relevant for farmers seeking to maintain healthy crops without relying on chemical fertilizers or pesticides. The reliance on chemical pesticides in conventional agriculture often leads to a cycle of dependency that can be detrimental to both the environment and human health.

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Challenges Faced by Farmers

Weather Conditions and Climate Change

Weather variability is a major concern, with farmers reporting increasing incidences of heavy rains, strong winds, and prolonged dry spells. One respondent remarked, *"Before, the weather was predictable. Now, the rains come too late or too much, destroying our crops…strong winds break the stem however, if the rains are just the right amount, the seeds grow properly. But also the heavy rains cause other unwanted plants to grow."* ***(P#7)***

The shift in climatic patterns has made planning difficult, forcing some farmers to adapt their planting schedules. The changes in climatic patterns necessitate adaptations in farming practices, including changes to planting schedules and crop management strategies. As climate change continues to influence weather variability, it is crucial for farmers to develop resilient agricultural practices to ensure sustainable production. Zhu et al. (2019) discuss the projected impacts of climate change on crop yields, emphasising that changes in rainfall patterns can significantly affect agricultural productivity. The sensitivity of crop yields to climate predictors highlights the challenges farmers face in adapting to unpredictable weather. This aligns with the respondent's experience of delayed or excessive rains leading to crop destruction.

Kukal and Irmak (2018) suggest that the influence of climate variability on crop yields is site-specific, reinforcing the notion that farmers must adapt their planting schedules based on localised weather patterns. Li (2023) highlights the role of land-atmosphere feedback in contributing to crop failures in rainfed agricultural systems. This shows that changes in land management can affect moisture availability and precipitation patterns, further complicating the planning process for farmers who rely on predictable weather. This underscores the interconnectedness of land management practices and climatic outcomes.

Theft and Security Issues

The theft of cannabis crops is a widespread issue, particularly among those farming in unsecured locations. Many farmers reported significant losses due to individuals who steal their crops before harvest. One farmer explained,

"People who do not plant come and steal at night. We work hard, but then we lose everything in one night." ***(P#6)***

Some respondents indicated that they have resorted to sleeping near their farms or forming informal community watch groups to deter theft. The issue of crop theft among farmers is a significant concern that has been documented in various studies, highlighting its detrimental impact on agricultural

productivity and farmers' livelihoods. Farmers have reported substantial losses due to theft, which can occur overnight, reflecting broader socio-economic challenges faced by agricultural communities.

Research indicates that theft of crops is a prevalent issue that hampers farmers' ability to adopt new agricultural technologies and practices. For instance, Arsene and Fyama (2021) stress that theft, alongside rising agricultural input costs, significantly hinders farmers' capacity to innovate and improve their production systems. The outbreak of the COVID-19 pandemic has further strained local food systems and exacerbated socio-economic crises. Ajibefun (2018) discussed the broader implications of agricultural crime, including crop theft, as a contributing factor to conflicts between farmers and herders in Nigeria, where such theft is often linked to larger socio-political issues.

Market Access and Pricing Struggles

The majority of farmers sell their cannabis locally, often at lower prices due to limited bargaining power. One respondent stated, *"We have to take whatever price we are given because we have no other options."* ***(P#2)***

Many farmers expressed a desire for better market access, with one noting, *"If we had direct buyers or cooperatives, we could get better prices for our product."* ***(P#11)***

Without formalised selling structures, farmers are often at the mercy of intermediaries who dictate the prices. The challenges faced by cannabis farmers regarding market access and pricing are multifaceted and deeply rooted in the dynamics of local economies and agricultural practices. A concern highlighted by farmers is their limited bargaining power, which often forces them to accept unfavourable prices dictated by intermediaries. This situation is not unique to cannabis farmers; it is a common issue across various agricultural sectors. Srinivasa et al. (2023) found that farmers' knowledge of minimum support prices does not significantly enhance their bargaining power due to the asymmetric power dynamics between farmers and traders, which often leaves farmers vulnerable to exploitation by intermediaries. This reflects a broader trend where farmers are compelled to accept whatever prices are offered, as they lack alternative market options.

Moreover, the establishment of cooperatives or direct buyer relationships has been identified as a potential solution to improve market access and pricing for farmers. Research indicates that when farmers can collectively market their products, they can enhance their bargaining position and achieve better prices (Yuniarto, 2023). This is echoed by Imami et al. (2021) who argue that agricultural cooperatives can play a crucial role in improving market access and ensuring fair pricing by providing farmers with the necessary support and resources to meet quality standards. The cooperative model not only enhances farmers' market power but also fosters a more equitable distribution of profits along the value chain, thereby addressing the issues of price discrimination often faced by individual farmers.

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Access to Quality Seeds and Farming Inputs

A recurring concern among farmers is the challenge of obtaining quality seeds. Many respondents rely on locally sourced seeds, which may not always produce high-yield crops. One farmer explained,

"We do not have a proper place to buy seeds. We just use what we have, but sometimes the results are not good." ***(P#4)***

The lack of access to improved seed varieties directly impacts productivity and profitability. The issue of access to quality seeds is a significant concern for farmers, as it directly influences their productivity and profitability. Many farmers rely on locally sourced seeds, which often do not meet the quality standards necessary for high yields. This reliance on informal seed systems can lead to suboptimal crop performance, as evidenced. Sarkar (2024) highlights that the formal seed system only supplies about 32% of quality seeds to farmers, with the remainder coming from informal sources, which may not always guarantee high yield potential. This finding underscores the challenges faced by farmers who lack access to improved seed varieties, as they often resort to using seeds that may not perform well, leading to dissatisfaction with their crop outcomes. Similarly, Ncube (2023) indicates that while some farmers perceive local seeds to be of comparable quality to formal seeds, the overall reliance on informal systems can compromise yield and productivity due to inconsistent quality. Moreover, Rabé (2023) illustrates that smallholder farmers often turn to informal seed systems due to the high costs associated with certified seeds, which are not readily available.

Financial Constraints and Lack of Credit Access

Most respondents indicated that they do not have access to formal credit or financial assistance, which limits their ability to invest in improved farming techniques. One participant shared, *"Banks do not give us loans because they do not recognise cannabis farming. Without money, we cannot grow our businesses."* ***(P#8)***

The absence of financial support structures leaves many farmers dependent on their personal savings or informal lending arrangements. Ouattara et al. (2020) highlight that smallholder farmers often face significant barriers to accessing formal credit, which is crucial for investing in agricultural improvements. The authors note that financial institutions frequently perceive agricultural lending as high-risk, particularly in sectors like cannabis that are not fully legalised or recognised by regulatory frameworks. This perception leads to a reluctance among banks to extend loans to farmers engaged in cannabis cultivation, as indicated by the participant's statement regarding banks' refusal to provide loans.

Nasereldin et al. (2023) explain that limited access to credit restricts farmers' ability to adopt new technologies and improve productivity. The study emphasises that without adequate financial resources, farmers are often unable to invest in essential inputs such as quality seeds, fertilizers, and modern

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farming equipment, which are necessary for enhancing crop yields and overall business growth. This aligns with the experiences shared by respondents who indicated that their reliance on personal savings or informal lending arrangements is insufficient for scaling their operations. The reliance on informal lending arrangements is a common coping mechanism among farmers facing financial constraints. However, informal lending often comes with high interest rates and unfavourable terms, which can further exacerbate financial instability for farmers. This reliance on informal sources can lead to a cycle of debt that hinders long-term investment in agricultural practices.

Economic Aspects of Cannabis Farming

Income Levels and Revenue Generation

The economic viability of cannabis farming varies significantly among participants. While some farmers earn a stable income, others struggle due to market instability and theft. One respondent noted, *"In a good season, I can make enough to take care of my family, but when thieves come, I lose everything."* ***(P#01)***

The economic viability of cannabis farming is a complex issue influenced by various factors, including income levels, market stability, and crime. The experiences shared by participants highlight the dichotomy within the cannabis farming community, where some farmers achieve financial stability while others face significant challenges, including theft and market fluctuations. Research indicates that the economic landscape for cannabis farmers is heavily influenced by their geographic and socioeconomic contexts. For instance, Friesen (2024) suggests that cannabis retail clusters tend to emerge in lower-income neighbourhoods, which may exacerbate economic disparities and contribute to market instability for local farmers.

The clustering can lead to increased competition and potential theft, as highlighted by the participant's experience of losing everything to thieves. Myran et al. (2021) found similar patterns in both the United States and Canada. Their findings suggest that the economic viability of cannabis farming is not only dependent on individual farmer practices but also on broader market dynamics and community safety. The cash-based nature of the cannabis economy makes workers vulnerable to theft, particularly in regions where cannabis farming is prevalent (Beckman, 2023). The economic viability of cannabis farming is shaped by a multitude of factors, including geographic location, market conditions, crime, and regulatory frameworks. The experiences of farmers reflect a broader narrative of economic disparity and vulnerability within the cannabis industry.

International Journal of Applied Research in Business and Management (ISSN: 2700-8983)
an Open Access journal by Wohllebe & Ross Publishing, Germany.
Volume: 06 Issue: 02 Year: 2025
https://doi.org/10.51137/wrp.ijarbm.2025.aoec.45836

Financial Support and Cooperative Memberships

Few farmers are part of any formal cooperative or association, which further limits their access to support and resources. One farmer mentioned, *"If we had a cooperative, we could work together and get better prices, but everyone is working alone."* ***(P05)***

The absence of structured support systems means that many farmers operate in isolation, making them vulnerable to market fluctuations. Cooperative structures can enhance the economic viability of agricultural producers by providing collective bargaining power and shared resources. A study by Heller et al. (2022) highlights that agricultural cooperatives can improve market access and stabilise prices for farmers, particularly in volatile markets such as cannabis. The cooperatives enable farmers to pool resources, share knowledge, and collectively negotiate with suppliers and buyers, thereby reducing the individual risks associated with market fluctuations.

The isolation experienced by cannabis farmers, as noted by the participant, is a significant barrier to their economic stability. Smith et al. (2023) emphasise that many small-scale cannabis farmers operate independently, which leaves them vulnerable to market changes and theft. The lack of a support network means that these farmers cannot leverage collective resources or knowledge, which can lead to increased financial instability. The study found that farmers expressed a desire for cooperative structures to enhance their bargaining power and access to resources. Moreover, cooperatives can provide essential services such as marketing, distribution, and financial assistance, which are critical for enhancing the economic resilience of farmers.

Potential for Economic Growth

Despite the challenges, many farmers remain optimistic about the future. One respondent expressed hope, stating, *"If we get help with security and markets, cannabis farming can change our lives."* ***(P#10)***

Some farmers are looking to expand their operations, while others are considering diversification into other high-value crops. The importance of security and market access in realising the economic potential of cannabis farming is underscored by a study conducted by Smith et al. (2023), which found that farmers who invest in security measures experience reduced theft and losses, leading to greater financial stability. Furthermore, the study suggests that improved market access, facilitated by cooperatives or associations, can enhance farmers' bargaining power and profitability. The combination of these factors can create a more favourable environment for growth and expansion in the cannabis sector.

The consideration of diversification into other high-value crops is a strategy that many farmers are exploring to mitigate risks and enhance income stability. Johnson and Lee (2023) argue that diversifying into high-value crops, such as organic vegetables or speciality fruits, can provide farmers with additional

income streams and reduce their dependence on a single crop, such as cannabis. This strategy not only enhances economic resilience but also contributes to sustainable agricultural practices. Cannabis farming has the potential to enhance the economic prospects of farmers and their communities with the appropriate support, such as access to capital, security, and market development.

Conclusion

This study examined the economic viability and challenges faced by small-scale cannabis farmers in the Eastern Cape, South Africa. The findings highlight that while cannabis farming holds the potential to contribute significantly to rural economies, several barriers continue to hinder its full commercialisation. Globally, the cannabis industry has demonstrated remarkable economic growth, generating substantial revenue and employment opportunities. However, the benefits have primarily accrued to large-scale enterprises, while small-scale farmers struggle to access formal markets due to high compliance costs, regulatory restrictions, and financial constraints. The Eastern Cape, despite its historical significance in cannabis production, faces similar challenges. Many farmers remain excluded from the legal cannabis economy due to restrictive licensing requirements, lack of financial support, and limited access to high-quality seeds and farming inputs.

The economic potential of the cannabis industry in South Africa is substantial, with government projections estimating it could generate R28 billion and create thousands of jobs. However, to realise this potential equitably, targeted interventions are necessary to integrate small-scale farmers into the formal market. Without these interventions, the industry risks replicating patterns of exclusion, further marginalising traditional growers.

Key Implications:

- Policy reforms: Simplify licensing procedures and reduce regulatory burdens to facilitate smallholder participation.
- Financial support: Develop accessible financing mechanisms tailored to the needs of small-scale cannabis farmers.
- Market development: Strengthen market access through cooperatives, direct buyer linkages, and fair-trade initiatives.
- Security and infrastructure: Address theft and security concerns by investing in community policing and rural infrastructure.

Future research should explore innovative cooperative models, public-private partnerships, and financing strategies that can support small-scale farmers in transitioning to a sustainable and profitable cannabis market.

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