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Sustainability of New Generation Commercial Farmers in South Africa: A North-West Province Case Study

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ABSTRACT

In this study, factors hindering emerging farmers in South Africa from farming sustainably were explored from the perspectives of emerging farmers, commercial farmers, and industry experts. In addition, industry experts gave actionable recommendations on what can be done to counteract the problems faced. A mixed-methods research approach was followed, with data obtained via questionnaires and Logistical Framework Analysis. The farmers and industry experts identified several factors hampering emerging farmers' economic, environmental and social sustainability. Among these factors were difficulty accessing finance, lack of extension officer support, low profitability, not implementing sustainable agricultural practices, not supporting local communities, and a lack of social entrepreneurship. Industry experts put forth numerous actionable recommendations to improve emerging farmers' social, environmental and economic sustainability. Recommendations included, among other things, acquiring crop insurance, sharing machinery, owning title deeds, using subject-specific advice, mentoring and succession planning, and government policies to enhance female participation in agriculture.

Keywords: Economic Sustainability, Emerging Farmers, Environmental Sustainability, Rural Development, Social Sustainability

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1. INTRODUCTION

Engaging in environmentally, economically and socially sustainable agricultural practices means growing crops and livestock in ways that simultaneously meet three objectives: economic profitability, social benefits to the farming community, and conservation of the environment (Sullivan, 2003).

Environmentally sustainable agriculture aims to minimise environmental damage and use resources more efficiently (Leigh & Wentworth, 2017). The ability of the environment to maintain its functioning within natural parameters and cycles over time is a key issue in South Africa due to a strong reliance on renewable and non-renewable resources (South Africa Department of Environmental Affairs, 2016). The main driver of economically sustainable agriculture is profitability. Therefore, where farmers have low profitability, the farming enterprise cannot reward the farmer with returns on his investment, resulting in the farm not being economically sustainable (Hofstrand & Johanns, 2019).

Social sustainability, in turn, is seen as a conceptually elusive concept. However, food security and rural development are essential for social sustainability because of their role in economic development and improving people's livelihoods (Sabyasachi & Satpati, 2013. Emerging farmers form an integrated part of the commercial agricultural sector, which aims to increase South Africa's food production, help alleviate hunger and aid economic development by improving food availability for the poor through lower prices and higher incomes (British Standards Institution, 2013; Prosperi *et al.*, 2014). In addition, farming contributes to the overall state of rural regions in terms of employment, business opportunities, and infrastructure (European Commission, 2000).

An environmentally, economically and socially sustainable agriculture system is essential to enhance farmers' and society's quality of life (Krall, 2015; United Nations, 2018) and to sustain the growing need for food production to combat food insecurities for an ever-growing population (National Research Council, 2010).

1.1. Challenges to Sustainable Farming Faced By South African Farmers

Farmers, especially emerging farmers in South Africa, face numerous challenges that hamper them from farming sustainably. Farmers need support in decision-making by providing

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information on effective farming methods and practices based on the latest research (Department of Environmental Affairs, n.d.). In addition, better support systems on the ground are needed for agricultural progress, including more professional extension systems (The Thematic Group on Sustainable Agriculture and Food Systems, 2015).

Consumer demands for quality standards, food safety, and safe handling involve specialised production, packing techniques, and refrigerated transport, all of which require large capital investments that small and medium-sized enterprises cannot easily afford. The consumers' and corporation's requirements and rules can act as effective barriers to participation in high-value chains for emerging farmers (Dorward, Kydd, & Poulton, 2008; Kirsten & Sartorius, 2002).

A lack of capital for investment is a prevalent problem among small-scale farmers in South Africa (Qwabe, 2014). The funding framework in South Africa does not appear to be geared toward emerging farmers; instead, it caters to existing commercial farmers (Mtombeni, Bove, & Thibane, 2019). Emerging farmers in South Africa also have low collateral value, restricting their access to finance (Kislat, Menkhoff, & Neuberger, 2013). Access to a comprehensive range of financial services is a significant challenge for emerging farmers, hindering economic development (De Klerk *et al.*, 2013). A lack of capital, in turn, results in farmers not owning the necessary machinery for their farming operations. Not owning machinery makes it difficult to do farming activities at the ideal time leading to potential yield losses and lowering profitability (Dane, 2020).

Smallholder farmers' incomes and livelihoods are increasingly affected by natural forces beyond their control. Yet, less than 20% of smallholder farmers globally have insurance against the impact of unexpected events (Rishi & Priebe, 2020). Climate change presents a threat to all farmers in South Africa. Due to global climate change, the climatic variability and occurrence of extreme weather events will likely lead to a substantial increase in agricultural risk, destabilising farm income (Gobin, Tarquis, & Dalezios, 2013).

A lack of succession planning also hinders the social sustainability of South African farmers. Since the future of food and agriculture lies in the hands of the next generation of family farmers, urgent actions are needed to support young people's engagement in agriculture and promote their active contribution to rural development (Food and Agriculture Organisation & IFAD, 2019).

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Social sustainability is further hampered by emerging farmers not investing in local community businesses. Investment in locally owned businesses leads to the sustainable use of local resources and the employment of local workers at decent wages, primarily serving local consumers (Shuman, 2021). In addition, a lack of specialised sustainable farming education threatens the sustainability of South Africa's emerging farmers. Therefore, education is essential for achieving a sustainable future (Skrefsrud, 2022).

Finally, a lack of female farmers is another challenge, risking the sustainability of emerging South African farmers (Acord, Oxfam & ActionAid, 2011). A study by El Neel (2018) showed that having women involved in farming significantly increased household food security and wealth. Women have important roles as food producers, managers of natural resources, caretakers of household food and nutrition security and contributors to household income (Olumakaiye & Ajayi, 2006). Furthermore, if women were given equal access to resources and human capital, they could achieve higher yields than men (Quisumbing *et al.*, 1996).

1.2. Sustainable Farming Practices

Emerging farmers in South Africa can mitigate the above challenges by engaging in sustainable farming practices that lead to greater economic, environmental, and social sustainability. Conventional farming (CF) practices contribute to numerous forms of environmental degradation, including air and water pollution, soil depletion, soil erosion, and diminished biodiversity (Bradley, 2002; Horrigan, Lawrence, & Walker, 2002; Lal, Reicosky, & Hanson, 2007; Gauker, 2010). In addition, CF practices aimed at higher yields per hectare strain the ability of the soil to maintain enough replenishment of essential natural minerals, leading to less nutrient-dense food (Montgomery, 2007; Benbrook *et al.*, 2008; Balmford *et al.*, 2018).

Environmental degradation is further exacerbated by careless farming practices, such as the irresponsible disposal of crop protection containers (CropLife International, 2019). In contrast, engaging in farming practices, such as conservation agriculture, organic agriculture, integrated crop management, climate-smart agriculture, and precision agriculture, can help farmers to farm more sustainably.

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1.2.1. Conservation Agriculture

Conservation agriculture tillage involves tillage practices ranging from zero tillage (No-till), reduced (minimum) tillage, mulch tillage, ridge tillage, and contour tillage. The aim is to minimise soil disturbance for a better soil environment and minimal environmental impact (Bradley, 2002; Palm *et al.*, 2014; Busari *et al.*, 2015). For example, farmers using no-till farming systems can reduce energy use by up to 70% (Gomiero, 2016). In addition, by not ploughing the soil and increasing the levels of crop residues that help conserve soil moisture (Ding, Schoengold, & Tadesse, 2009), they can minimise topsoil losses due to erosion *(*Claassen *et al.*, 2018).

Increased levels of crop residue lead to higher soil carbon, which positively affects the activities of soil macrofauna (Liu *et al*., 2006; Lal, 2004; Kargas, Kerkides, & Poulovassilis, 2012).

1.2.2. Organic Agriculture

Organic agriculture can be defined as a farming system where farmers work with nature rather than against nature, using environmentally friendly methods of weed, pest, and disease control aimed at producing food with minimal harm to ecosystems, animals, and humans (Šrůtek & Urban, 2008; Seufert, Ramankutty, & Foley, 2012; Pimentel & Burgess, 2013). Studies have found that organic agriculture farming systems are more environmentally friendly than conventional farming systems, resulting in greater soil carbon levels, better soil quality, and less soil erosion and groundwater pollution (Bengtsson, Ahnström, & Weibull, 2005; Tuomisto *et al.*, 2012; Muller *et al.*, 2017).

1.2.3. Integrated Crop Management

Integrated crop management concentrates on the whole farm operation. It links best management practices into an integrated plan while broadening integrated pest management by incorporating all aspects of crop production (Padgitt *et al.*, 2001). The system requires a high investment in infrastructure. The increased complexity of this system results in a higher risk and demands better-qualified farmers, managers, technicians, and workers to manage the system (Balbino *et al.*, 2014).

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According to Rana and Chopra (2013), the integrated crop management system provides synergy among different agricultural divisions and an opportunity to increase economic yield and profitability, resulting in greater sustainability.

1.2.4. Precision Agriculture and Digitalisation

Precision agriculture is made possible by digitalising agriculture (Comninos, 2020). According to the African Development Bank (2021), there are several opportunities for digital agricultural solutions to substantially increase resource use efficiency, profitability, transparency, market participation, and environmental sustainability. Digital solutions also have the potential to create more efficient agricultural value chains by decreasing costs, increasing decision support, reducing loss, and improving sustainable resource use efficiency (Kenney, Serhan, & Trystram, 2020).

1.2.5. Crop Diversity, Cover Crops and Crop Rotation

Increasing crop diversity on a farm can contribute to soil conservation, wildlife habitat, and increased populations of beneficial insects. Cover crops in the off-season after harvesting can provide several benefits, including improved soil quality and fertility, weed suppression, and erosion control (Legg & Viatte, 2001). In addition, crop rotation with different crops plays an important role in the development and distribution of bio pores and the dynamics of microbial communities through the recycling of crop residues, thus contributing to the development of soil structure and helping prevent soil degradation (Ball *et al.*, 2005).

3. AIMS OF THE STUDY

This study aimed to explore problems emerging farmers face in the South African context from the perspectives of emerging farmers, commercial farmers, and industry experts. Furthermore, the study aimed to give actionable recommendations to emerging farmers on increasing their farms' economic, environmental, and social sustainability by obtaining inputs from industry experts.

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4. METHODS

4.1. Research Design

A mixed-methods research design was used for this study. Closed-ended questionnaires measuring economic, environmental and social sustainability were distributed to emerging and commercial farmers growing dry beans for the Zamukele and HSB projects in the North-West Province of South Africa.

An adapted Logical Framework Analysis (LFA) tool was used to collect qualitative data from industry experts to determine what they believe is needed to improve emerging farmers' sustainability.

4.2. Sample and Data Collection

The sample consisted of 14 emerging farmers from the Zamukele dry bean growers group and nine commercial farmers growing dry beans for HSB.

4.3. Data Analysis

Quantitative data was analysed by running descriptive statistics for all questions using the Statistical Package for the Social Sciences (SPSS) version 26. In addition, Logical Framework Analysis was used to analyse the qualitative data from industry experts.

5. RESULTS AND DISCUSSION

5.1. Economic Sustainability of Emerging Farmers

Emerging farmers highlighted the difficulty in accessing finance as hampering their economic sustainability. In addition, the lack of extension officer support and the availability of land on the market were also seen as problematic. However, a lack of farming experience was seen as less problematic (Figure 1).

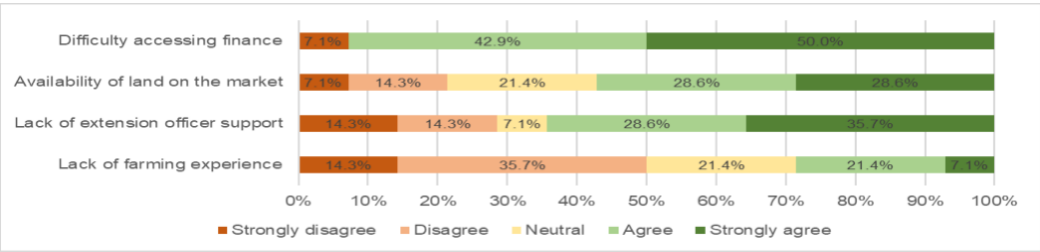

FIGURE 1: Factors Hampering Farm Economic Sustainability According to Emerging Farmers

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These findings align with previous studies showing that lack of capital for investment is a prevalent problem for small-scale farmers in South Africa (Qwabe, 2014) and that better support on the ground in the form of more professional agricultural extension systems is needed (The Thematic Group on Sustainable Agriculture and Food Systems, 2015).

Emerging farmers also found not owning the necessary machinery problematic. All emerging farmers indicated that they do not own a harvester and use contractors to harvest for them. Most emerging farmers (77.7%) then noted that they had to wait for contractors, resulting in them not harvesting at the ideal time. This corresponds with the findings by Dane (2020) that farmers not owning the necessary machinery resulted in yield losses and lowered profitability.

Cost factors that hampered emerging farmers from farming sustainably, as highlighted by the farmers, included the cost of labour, direct input costs, and farm instalments. In addition, contractor fees and leases of agricultural farmland were seen as particularly problematic (Figure 2).

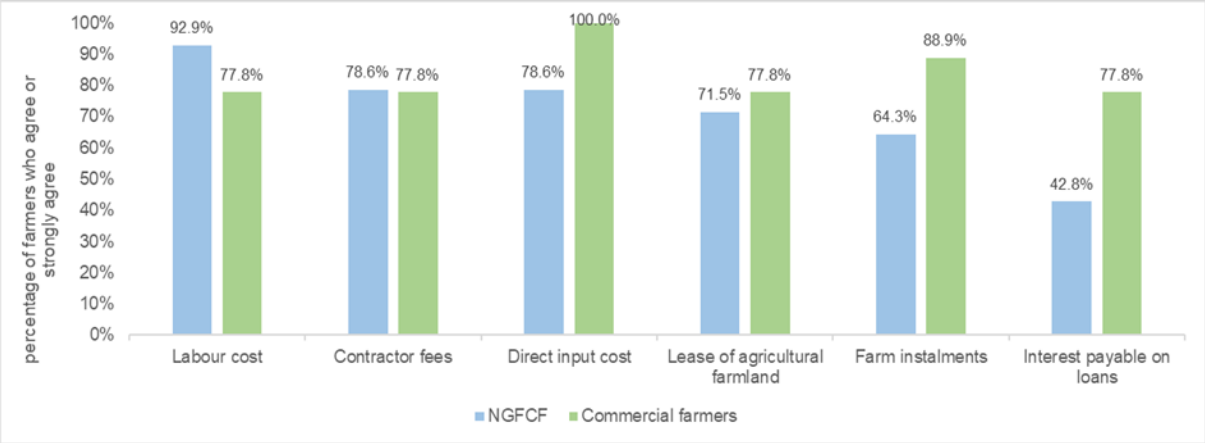

FIGURE 2: Cost Factors That Hamper Emerging Farmers From Farming Sustainably

These findings are not surprising, given that the literature shows that emerging farmers in South Africa experience financial constraints due to factors such as barriers to participation in high-value chains (Dorward, Kydd, & Poulton, 2008; Kirsten & Sartorius, 2002), the funding framework in South Africa favouring commercial farmers (Mtombeni, Bove, & Thibane, 2019), and emerging farmers' lack of knowledge around the importance of taking out insurance policies (Rishi & Priebe, 2020). Financial constraints hamper emerging farmers from buying machinery and from being able to afford all the abovementioned costs.

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5.2. Industry Experts' Views On Emerging Farmers' Economic Sustainability

The views of industry experts on the economic sustainability of emerging farmers were captured by a Log Frame Analysis (Figure 3).

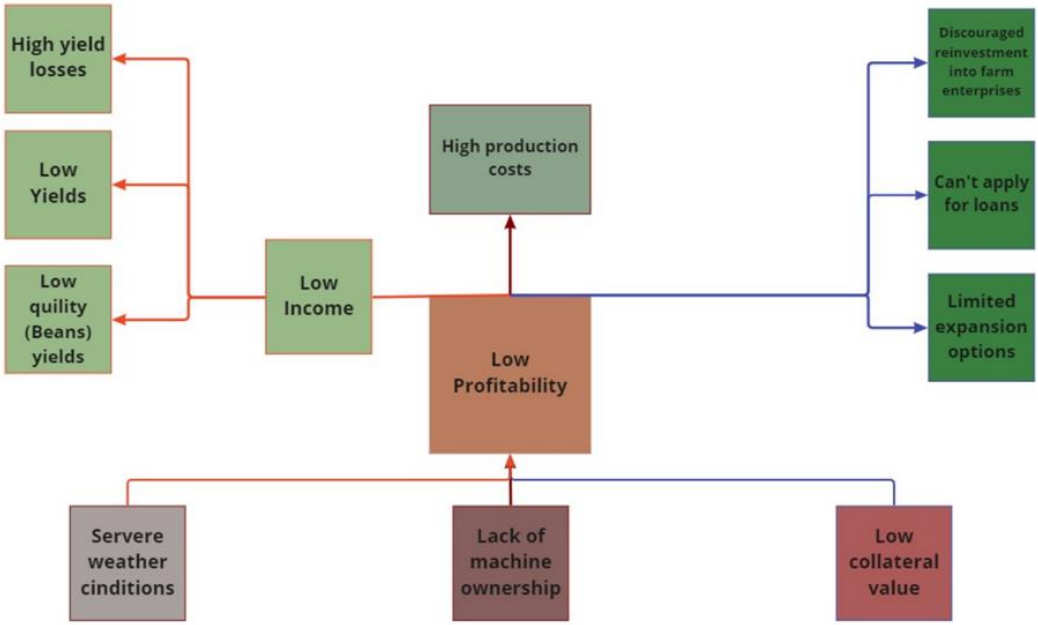

FIGURE 3: Problem Tree By Industry Experts For Emerging Farmers' Economic Sustainability

The core problem focus was low profitability, which forms the tree trunk in the middle of Figure 3. As mentioned, profitability is crucial for economic sustainability. Low profitability results in the farming enterprise being unable to reward the farmer with returns on his investment (Hofstrand & Johanns, 2019). The problems related to economic sustainability identified by industry experts were divided into causes and effects. The causes are the roots of the Problem Tree, and the effects are the branches.

The first cause identified was severe weather conditions. Severe weather conditions damage crops, resulting in lower yields and income, low return on investment and cash flow restrictions. This aligns with the literature on global climate change, which leads to extreme weather events that increase agricultural risk and destabilise farm income (Gobin, Tarquis, & Dalezios, 2013).

The second cause was not owning machinery. In this case, participants not owning harvesting machinery led to late harvesting. This resulted in beans becoming too dry for canners to use and shattering and splitting during harvesting and at the processing plants, leading to income

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losses for emerging farmers (Liebenberg, 2002). Not owning the necessary machinery results in emerging farmers using more labour and being unable to perform farming activities at the ideal time. The result is additional production costs, potential yield losses, and lowered profitability (Dane, 2020).

The third cause identified by experts was low collateral value. According to Kislat, Menkhoff, and Neuberger (2013), the lack of collateral contributes to restricted access to finance. Access to financial services is a significant challenge for emerging farmers that hinders economic development (De Klerk *et al*., 2013). According to industry experts, low collateral value results in emerging farmers being unable to expand their farming enterprise and access finance. Access to financial services is critical for providing funds for farm investments to improve productivity and postharvest practices, for improving household cash flow, and for enabling farmers to have better access to markets and to manage risks associated with farming (Gaamaa *et al.*, 2014).

The next phase in the LFA process is to turn the Problem Tree into an Objective Tree. The Objective Tree describes the future situation once the identified problems have been solved. This involves reformulating the negative statements of Figure 3 into positive statements to achieve in the future. The logical cause-and-effect relationship is converted into a logical activity-ends relationship that forms the Objective (Van Niekerk, 2012). The Objective Tree is displayed in Figure 4.

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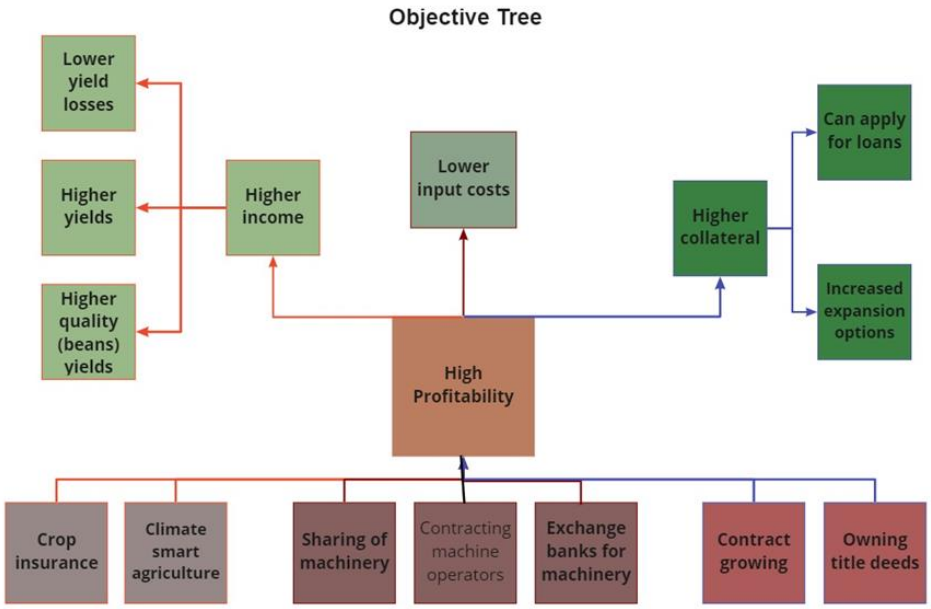

FIGURE 4: Objective Tree By Industry Experts For Emerging Farmers' Economic Sustainability

In the Objective Tree, the trunk represents the core objective statement for emerging farmers to achieve economic sustainability. The roots represent the activities to reach the objectives, and the branches represent the end goals.

The industry experts identified several desirable ends for emerging farmers to achieve economic sustainability. These ends included higher income due to higher yields, higher quality beans, lower yield losses, lower input costs, and higher collateral, improving emerging farmers' ability to apply for loans and expand.

The industry experts identified seven activities that would enable emerging farmers to become economically sustainable. The seven activities are:

1. Crop insurance
2. Climate-smart agriculture
3. Sharing of machinery
4. Contracting machine operators
5. Exchange banks for machinery
6. Contract growing
7. Owning title deeds

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5.3. Environmental Sustainability of Emerging Farmers

A crucial factor in improving emerging farmers' environmental sustainability is using qualified people for advice on best management practices for preventing soil erosion, improving soil health and fertility, using the correct crop protection products, and correctly using guidelines to store products and discard empty containers safely. In this regard, it is problematic that only 35.7% of the participants received regular visits from government extension officers, and only 42.9% reported receiving sound advice from these officers.

This finding is in line with the literature showing that better support systems on the ground are needed for emerging farmers, including more professional extension services that can help farmers with decision-making by providing information on more effective farming methods and practices based on the latest research (The Thematic Group on Sustainable Agriculture and Food Systems, 2015).

Several techniques and strategies have been proven to promote environmental sustainability, including doing soil surveys, conservation cultivation practices like no-till or minimum-till (Karayel & Sarauskis, 2019), organic farming (Šrůtek & Urban, 2008; Seufert, Ramankutty, & Foley, 2012; Pimentel & Burgess, 2013), crop rotation (Ball *et al*., 2005), the use of cover crops (Legg & Viatte, 2001), and the correct use of crop protection products.

Most emerging farmers strongly agreed that a soil survey is important to determine the best soil for crop production (71.4%) and that taking the necessary steps to prevent soil erosion is recommended (64.3%).

It is concerning that a substantial proportion of participants (42.9%) indicated that they make use of conventional cultivation tillage, while only a third of the emerging farmers applied organic amendments (35.7%). As noted, conventional farming practices contribute to numerous forms of environmental degradation, including air and water pollution, soil depletion, soil erosion, and diminished biodiversity (Bradley, 2002; Horrigan, Lawrence & Walker, 2002; Lal, Reicosky & Hanson, 2007; Gauker, 2010; Palm *et al*., 2014). In contrast, conservation tillage methods use less time and fuel, lead to less soil erosion, and require fewer labourers. At the same time, it stimulates higher agricultural productivity, increases the moisture retention capacity of the soil, reduces soil compaction and crust formation, lessens carbon emissions and air pollution, and improves surface water quality (Karayel & Sarauskis, 2019). Furthermore,

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organic farming and conservation tillage improve soil health by increasing microorganisms' abundance, diversity, and activity (Tahat *et al.*, 2020).

Most emerging farmers rotated crops (92.9%) to improve soil health. However, only 21.4% made use of cover crops. As noted, planting cover crops in the off-season enhances soil quality and fertility, suppresses weeds, and controls erosion (Legg & Viatte, 2001). Crop rotation, in turn, is important for the development and distribution of bio pores and the dynamics of microbial communities by recycling crop residues (Ball *et al.*, 2005).

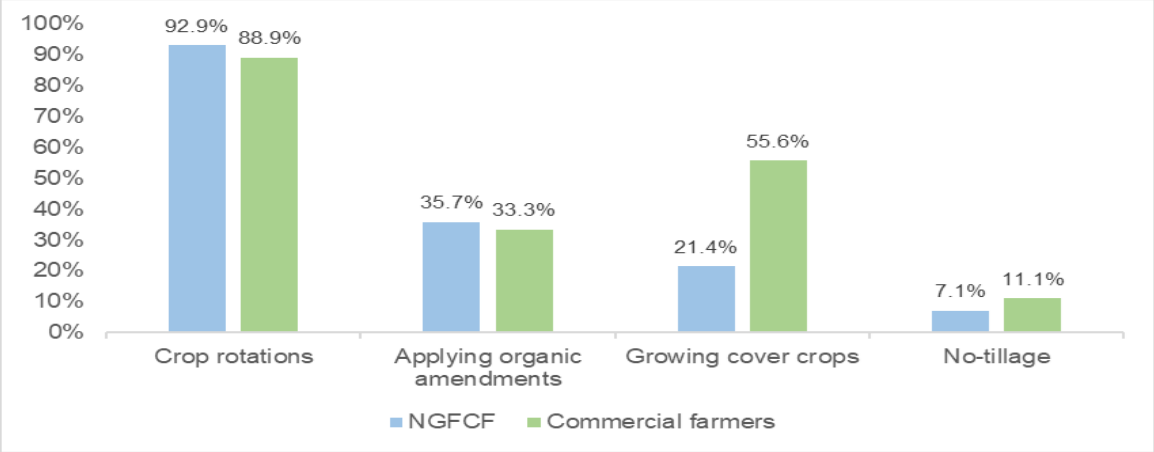

FIGURE 5: Steps to Improve Soil Health (Comparison of Emerging and Commercial Farmers)

Commercial farmers emphasised crop rotations to improve soil health, with 88.9% indicating this as an important factor. Growing cover crops was seen as important by 55.6% of commercial farmers. Commercial farmers viewed organic amendments and no-tillage as less critical for improving soil health.

Most emerging farmers (77.8%) use soil testing to improve soil fertility. At the same time, almost two-thirds noted that balancing soil nutrients and using a balanced fertiliser program is important for improving soil fertility. These findings are encouraging, given that integrated soil fertility management approaches that combine organic fertiliser resources with optimal chemical fertilisers effectively improve soil health and productivity (Ghorbani *et al.*, 2008; Vanlauwe *et al.*, 2010).

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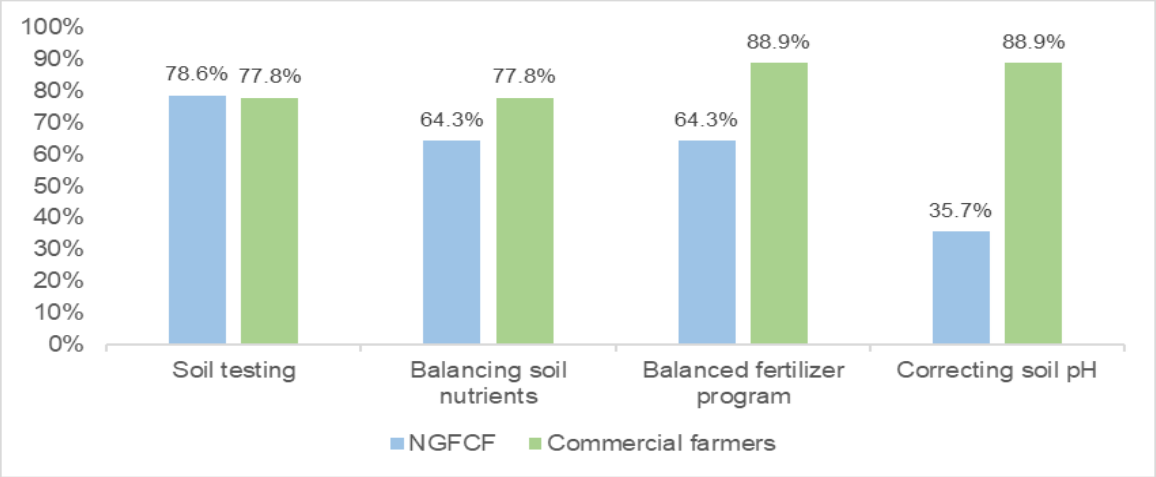

FIGURE 6: Steps to Improve Soil Fertility (Comparison of Emerging and Commercial Farmers)

More than three-quarters of commercial farmers rated soil testing, balancing soil nutrients, using a balanced fertiliser program and correcting soil pH as necessary for improving soil fertility.

Regarding factors that impact environmental protection, all emerging farmers were made up of qualified individuals to advise them on crop protection products, and 92% followed the instructions on the label for the use and application. Most emerging farmers (57.1%) used chemical products, while 42.9% used a combination of chemical and biological products. Most emerging farmers strongly agreed (57.1%) that following guidelines to safely store crop protection products and discard empty crop protection containers is important. Concerning environmental sustainability, 14.2% of participants disagreed or had a neutral view on discarding empty crop protection containers, and 7.1% did not follow the instructions on the label when using and applying crop protection products. The appropriate disposal or recycling of empty crop protection containers is essential for protecting the health of farmers, their communities, and the environment (CropLife International, 2019).

5.4. Industry Experts' Views On Emerging Farmers' Environmental Sustainability

The core problem was not implementing sustainable agricultural practices, forming the tree trunk in the middle of Figure 7. The industry experts identified various problems that were divided into causes and effects. The roots of the problem tree represent the causes, and the branches represent the effects.

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The first cause identified was not utilising advice, directly impacting how emerging farmers go about sustainable environmental practices. The effect of not using advice on agricultural production negatively influences their ability to solve problems and obtain information, skills, and technologies to improve sustainability (Davis, 2009). However, given the earlier findings, the problem is probably a lack of extension support rather than farmers, not heeding advice.

The second cause identified was a lack of education on soil erosion, negatively impacting soil degradation and erosion management and prevention. Educational campaigns focused on farmers' sense of social responsibility and their profit motives positively impacted the adoption of new, environmentally sound technologies (Wang, 2009).

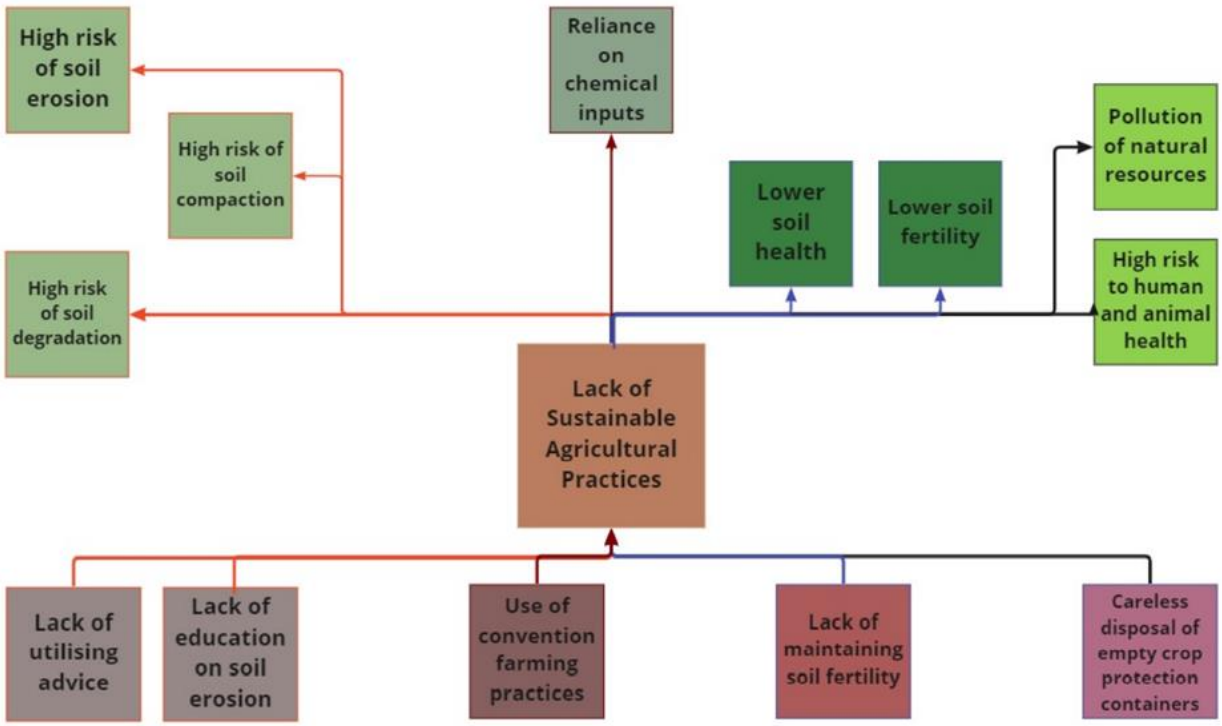

FIGURE 7: Industry Experts' Problem Tree for Emerging Farmers' Environmental Sustainability

The third cause identified was the use of CF practices. CF-based agriculture increases erosion rates enough to make farming unsustainable (Montgomery, 2007). CF contributes to air and water pollution, soil depletion, soil erosion and diminishing biodiversity (Bradley, 2002; Horrigan, Lawrence & Walker, 2002; Lal, Reicosky & Hanson, 2007; Gauker, 2010; Palm *et al.*, 2014).

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The fourth cause identified was not maintaining soil fertility, negatively impacting soil health and fertility. Providing plants with balanced essential nutrients through organic matter and minerals is the basis of healthy soils. This is the foundation of the food system that produces healthy crops that nourish people (Ghorbani *et al*., 2008).

The fifth cause identified was the careless disposal of empty crop protection containers, leading to adverse effects on the health of humans and animals and the pollution of natural resources. Farmers must dispose of crop protection containers responsibly and ethically to maintain a healthy ecosystem. Appropriately disposing of or recycling empty crop protection containers is essential to protect the health of farmers, their communities and the environment (CropLife International, 2019).

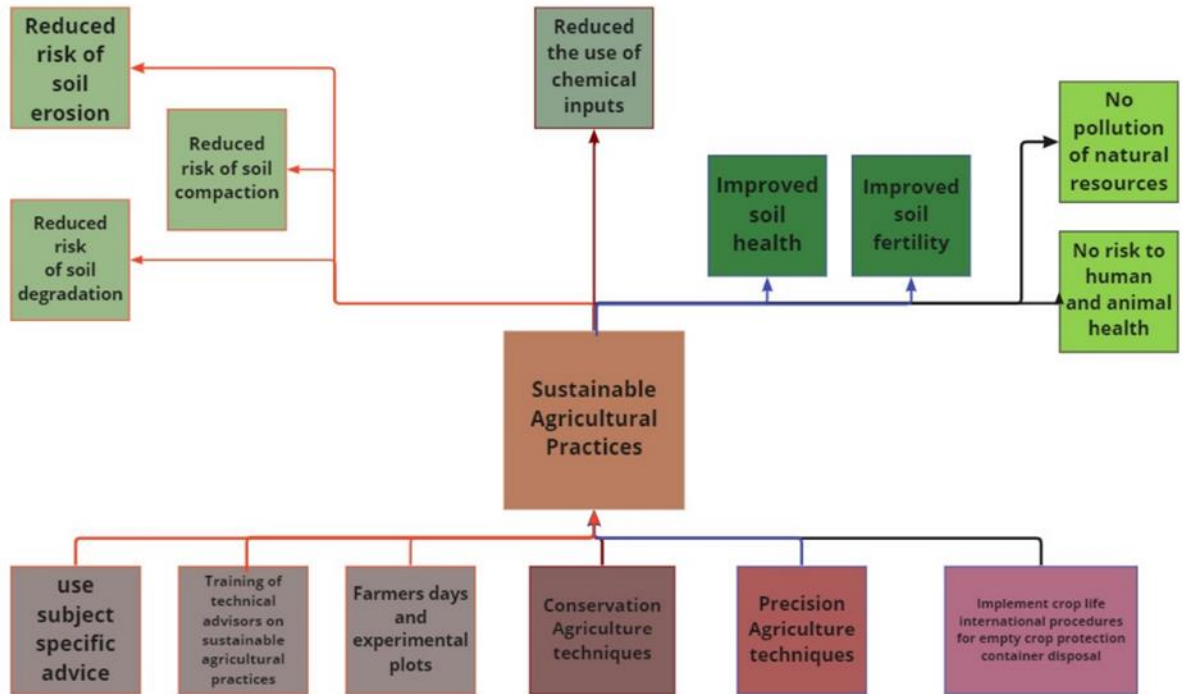

FIGURE 8: Industry Experts' Objective Tree For Emerging Farmers' Environmental Sustainability.

The industry experts identified seven central activities that they believed would enable emerging farmers to become environmentally sustainable, including:

1. Use of subject-specific advice.
2. Training of technical advisors on sustainable agricultural practices.
3. Farmer's days and experimental plots.
4. Conservation agriculture (CA) techniques.

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5. Precision agriculture (PA) techniques.
6. Implement crop life international procedures for empty container disposal.

5.5. Social Sustainability of Emerging Farmers

Rural development is vital for promoting social sustainability through poverty reduction and improving rural livelihoods (Sarris, 2001). The support and involvement of farms in communities can aid rural development in different ways. Farming contributes significantly to the overall state of rural regions in terms of employment, business opportunities, and infrastructure (European Commission, 2000).

Emerging and commercial farmers were asked what support they felt was important and how emerging farmers support local families to promote rural development and social sustainability (Figure 9).

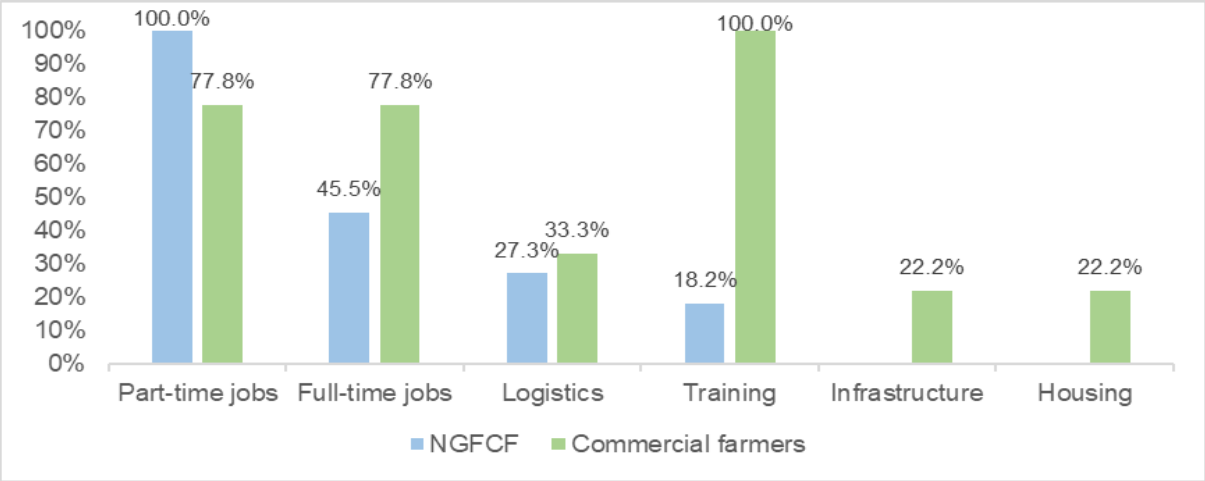

FIGURE 9: Support Provided to Local Families

Commercial farmers emphasised the importance of training local families to promote social sustainability. In addition, commercial farmers highlighted providing part-time and full-time jobs to local families as crucial for social sustainability. In line with the views of the commercial farmers, all emerging farmers indicated that they provide part-time jobs to local families, while 45.5% provide full-time jobs. However, in contrast to commercial farmers' views on the importance of training, less than a fifth of emerging farmers indicated that they provide training to local families.

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5.6. Industry Experts' Views On Emerging Farmers' Social Sustainability

The core problem identified was the lack of social entrepreneurship initiatives, forming the tree trunk in the middle of Figure 10. The industry experts identified various problems that were divided into causes and effects. The roots of the problem tree represent the causes, and the branches represent the effects.

The lack of succession planning was the first cause identified, with its primary effects a high risk of food insecurity (Ntshangase *et al.*, 2016), an increased risk of unemployment (Aladejebi, 2021), and low rural development. As noted, the generational renewal of family farming is a precondition for keeping agriculture viable and sustainable. Retaining young people on farms and in rural communities is crucial for the future of food and agriculture (Food and Agriculture Organisation & IFAD, 2019).

The second cause identified was a lack of local business investment. Investment in locally owned businesses leads to the sustainable use of local resources and employment of local workers at decent wages (Gaamaa *et al.*, 2014).

A lack of specialised agricultural education was the third identified cause. With education essential for achieving a sustainable future (Skrefsrud, 2022), a lack thereof is a serious risk factor for South Africa's emerging farmers' sustainability.

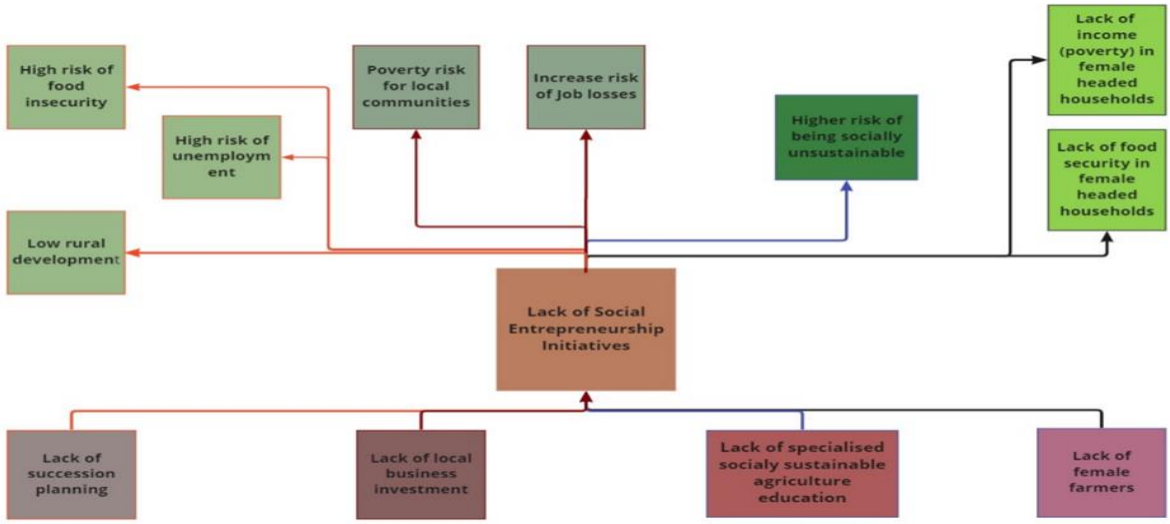

FIGURE 10: Industry Experts' Problem Tree For Emerging Farmers' Social Sustainability

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The fourth cause identified is the lack of female farmers. The effects expected are a lack of female-driven value-adding initiatives and low food security in female-headed households. As noted, female farmers are important as food producers, natural resource managers, caretakers of household food and nutrition security, and contributors to household income (El Neel, 2018; Olumakaiye & Ajayi, 2006). It has also been shown that women farmers can achieve higher yields than men, given equal access to resources and human capital (Quisumbing *et al.*, 1996).

In the Objective Tree, the trunk represents the core objective statement: improved social entrepreneurship initiatives for emerging farmers. The roots represent the activities to reach the objectives, and the branches represent the end goals.

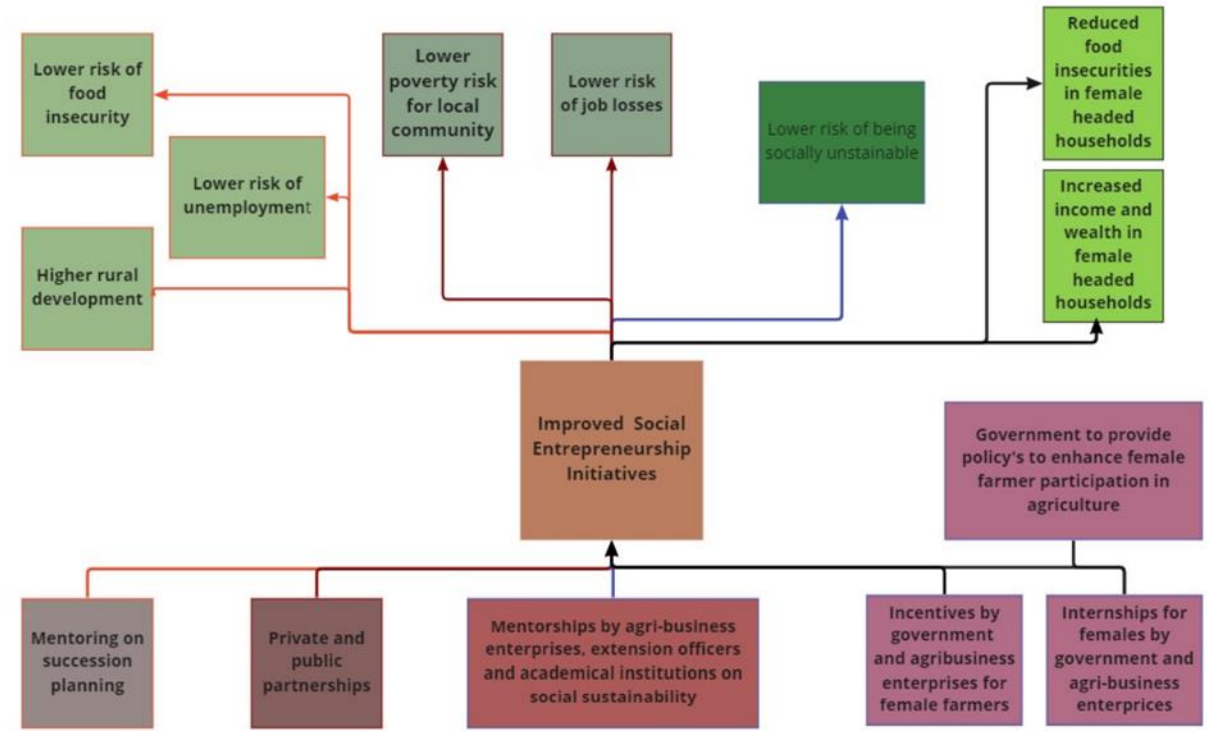

FIGURE 11: Industry Experts' Objective Tree For Emerging Farmers' Social Sustainability

The industry experts identified several desirable ends for emerging farmers to achieve social sustainability, including (i) lowering the risk of food insecurity, unemployment, and poverty for local communities, (ii) reducing job losses, (iii) increasing income and wealth in female-headed households, and (iv) increasing rural development.

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The industry experts identified eight central activities that they believed would enable emerging farmers to become socially sustainable. These six central activities are:

1. Mentoring on succession planning.
2. Private and public partnerships.
3. Mentorships by agribusiness enterprises, extension officers and academic institutions on social sustainability.
4. Conservation agriculture (CA) techniques.
5. Internships for females by government and agri-business enterprises.
6. Incentives by the government and agri-business enterprises for female farmers.
7. Government-provided policies to enhance female farmer participation in agriculture.

6. CONCLUSION

This study aimed to explore problems emerging farmers face in the South African context from the perspectives of emerging farmers, commercial farmers, and industry experts. Furthermore, the study aimed to give actionable recommendations to emerging farmers on increasing their farming practices' economic, environmental, and social sustainability by obtaining inputs from industry experts.

From the emerging and commercial farmers' perspective, difficulty accessing finance, lack of extension officer support, lack of land on the market, labour costs, contractor fees, not owning machinery, leasing costs, farm instalments, and direct input costs hindered economic sustainability. Industry experts identified low profitability as hindering emerging farmers' economic sustainability.

The industry experts put forth seven actionable solutions to enable emerging farmers to become economically sustainable, including emerging farmers (i) acquiring crop insurance, (ii) engaging in climate-smart agriculture, (iii) sharing machinery, (iv) using contract machine operators, (v) exchanging banks for machinery, (vi) using contract growing, and (vii) owning title deeds.

The problems hindering environmental sustainability identified by emerging and commercial farmers included a lack of guidance from extension officers on implementing sustainable

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agricultural practices and the consequent lack of implementation of methods such as rotating crops, testing soils and balancing soil nutrients.

Aligned with the farmers' views, the industry experts identified not implementing sustainable agricultural practices as the core problem affecting emerging farmers' environmental sustainability.

The actionable solutions proposed by the industry experts centred around educational interventions. The solutions included using subject-specific advice, training technical advisors on sustainable agricultural practices, farmer's days and experimental plots, using conservation- and precision agricultural techniques, and implementing crop life international procedures for empty container disposal.

Finally, rural development has been recognised as critical in promoting social sustainability. Farmers can influence rural development by supporting and becoming involved with the local communities. However, the results show that local families lacked support from the emerging farmers participating in the study. Although all the emerging farmers indicated that they provide part-time jobs to local families, less than half provided full-time jobs, and even fewer helped with logistics or provided training to these families. Industry experts identified a lack of social entrepreneurship initiatives as the core problem hindering social sustainability.

After identifying the problems, the industry experts identified eight activities they believed would enable emerging farmers to become socially sustainable commercial farmers. These include mentoring and succession planning, private and public partnerships, social sustainability mentorship by agribusiness enterprises, extension officers and academic institutions, internships and incentives for female farmers by government and agri-business enterprises, and government policies to enhance female farmer participation in agriculture.

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