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# Application of indigenous knowledge and sustainable agriculture by small-scale farmer households and entrepreneurs in South Africa

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## Abstract

Indigenous Knowledge Systems are seen as a prerequisite in various setting for Africans when adopting sustainable agricultural practices and entrepreneurship. Interviews were conducted with 18 crop farmers, 8 livestock farmers and 40 community stakeholders who are residents of Bizana Municipality in the Eastern Cape Province, South Africa. A qualitative content analysis approach was utilised to interpret the data. According to the findings of the study sustainable farming practices are not very common. The majority of farmers were familiar with sustainable farming practices; however, they were adamant about implementing these practices in order to boost their crop yields. In a similar vein, the community did not have a common understanding of what factors contribute to the expansion of a sustainable economy in terms of business growth. The findings presented here suggest a link between the socio-economic and environmental conditions of Bizana farms and communities, but they also suggest that many people and organisations can cooperate to strengthen this link. Indigenous knowledge systems are one way to improve this connection because they contain tried-and-true techniques.

***Keywords:*** Indigenous Knowledge Systems; Entrepreneurship; Enterprises; Knowledge; Sustainable Agriculture

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## 1. Introduction

Indigenous entrepreneurship or business ventures started and run by indigenous people (black African), benefits both their communities and the larger society in which they live (Dana, 2015; Swanson and DeVereaux, 2017). The preservation of Indigenous culture, which has long-term intrinsic value and is an important part of a country's identity, can also be achieved through Indigenous entrepreneurial endeavours (Clydesdale, 2007; Collins et al., 2017; Peredo and McLean, 2013). Indigenous entrepreneurship results in both financial and non-financial benefits such as contributing to local economic development, maintaining Indigenous culture, and protecting the local environment (Giovannini, 2014; Spencer et al., 2016; Vazquez Maguirre et al., 2018; Zapalska and Brozik, 2017). Viewing Indigenous entrepreneurship from the perspective of the resource-based view of the firm (Barney, 2001), Indigenous entrepreneurs are both best placed to draw resources from Indigenous cultural capital (Hipango and Dana, 2012) and adopt a long-term view in maintaining it. Furthermore, indigenous entrepreneurs are likely to proactively protect the environment due to their connection to the land through past and future generations (Phillips et al., 2016), reinforced by economic incentives when the environment is an integral part of their product or service being supplied (Buultjens et al., 2010; Lemelin, et al., 2015).

Indigenous entrepreneurs often create value by explicitly combining Indigenous culture with aspects of the environment, such as in marketing Indigenous plants collected using traditional methods (Dana and Hipango, 2011). For indigenous ventures, economic goals are accompanied by culture, environment, and Indigenous community-related goals: “there are more stakeholders involved than with non-Indigenous businesses” (Dana and Anderson, 2007). Nonetheless, when Indigenous culture and the local environment are part of the product, these goals are aligned as, for example, a vibrant Indigenous community is essential for maintaining Indigenous culture, which is at the core of the Indigenous venture’s value proposition. Indigenous culture is linked to indigenous knowledge systems.

In academia, there is growing acceptance of the importance of indigenous knowledge systems (IKS) in the sustainable development process. This appreciation stems from a view that success in rural communities depends on whether the priorities, needs and experiences of local people are incorporated into various projects or initiatives (Dana, 2015). This is particularly the case in rural development, especially in small businesses, agriculture development and increasingly sustainable alternative economies stemming from recognised environmental problems associated with climate change (Brueckner et al., 2014).

Current anthropological studies especially in cognitive anthropology reveal that non-western societies have searched for knowledge of physical reality throughout the ages. Cognitive anthropology is defined as the study of cognition in cultural and cross-cultural settings. Their understanding of the physical universe is codified in the systems of knowledge known as Indigenous knowledge systems. This body of knowledge is passed from generation to generation through mainly oral transmission. In each generation, the knowledge content is modified and enriched by the individuals in a community. Considering the IKS is crucial to the success of rural development projects. Chambers (1988) argued that if researchers, scholars, scientists, and field workers are serious about solving rural poverty, they must appreciate the validity of indigenous knowledge. This appreciation comes about by immersing one into that specific culture where they intend to solve the problem.

While literature on IKS and small businesses is growing, little is known about their links. Little is known about how Indigenous knowledge systems can be used to develop rural SMEs (Felzensztein et al., 2013).

Studies blending IKS and small business development are important in the design of rural development projects that are not only productive and sustainable but cultural relevant (Zapalska and Brozik, 2017).

Indigenous entrepreneurship studies in the Sub-Saharan region, however, are scarce. Entrepreneurs and policymakers in the region can both benefit from a better understanding of indigenous entrepreneurs' experiences and business models (Brueckner et al., 2014; Down, 2012). Preliminary findings from an exploratory comparative study of indigenous entrepreneurship in South Africa are presented in this article to fill this research gap. Even though all these topics are not new in literature, to the best of our knowledge they fail to address the connection between IKS and entrepreneurship. The article aims to address the following objective:

- To examine local community knowledge, perceptions and attitudes toward sustainable development and usage of indigenous knowledge systems in enterprises.
- To investigate the role of indigenous social enterprises in sustainable development and indigenous knowledge.

## 2. Sustainability and IKS

Numerous small businesses strive to keep a balance in achieving profits and using sustainable means to generate those profits. There is a depth of literature that demonstrates that pursuing sustainability creates a competitive advantage and differentiated position from competitors (Galpin et al., 2005). However, less attention has been given to the role of indigenous people and their relationship with value creation in the context of sustainable development. In this study, efforts are done in reframing the discussion within the context of sustainable development by extending it to South Africa. In this reframing, there is a considerable effort to consider the cultural, ecological, and social environment of small business enterprises.

Despite the growing interest in the field of sustainability for small and medium-sized enterprises (SMEs), they are a high failure rate which presents a challenge to the growth of SMEs. Due to their nature, SMEs are usually faced with a problem of economic sustainability, especially in a country like South Africa where informal SMEs account for 54%. Indigenous knowledge system management (IKS) has become a primary source to support SMEs' innovation and sustain economic survival. SMEs rely on employees' knowledge and skills to build a competitive advantage instead of depending on their financial and psychical assets like large companies (Cardoni et al., 2018; Castellani and Fassion, 2019). The knowledge base is in numerous places within the firms such as culture, employees, policies, organisational culture, and documents (Allegre et al., 2011), and it is an asset used to create a competitive advantage due to that it cannot be replicated or replaced.

It is asserted that for ethical concerns sustainable development creates the least harm for all inhabitants. The current trend of consumption indicates that it is unsustainable and undermines the systems on which humans and other species depend.

### 2.1. IKS and rural development

In rural development literature, they are numerous cases where government planners and international agencies impose their developmental plans on rural populations. In many of these instances, the failure is to continue with indigenous knowledge and to tag it as invalid or backward. The imposition of various policies

by the government does not take into consideration the knowledge base of communities. Government support programs can be key drivers of profitable and sustainable indigenous enterprises (Curry et al., 2016; Erdmann, 2016; Spencer et al., 2016; Zapalska and Brozik, 2017), and more so when designed to address the specifics of indigenous culture (Pinto and Blue, 2017; Yonk et al., 2017).

Operating in remote regions may provide indigenous entrepreneurs with access to resources not available to mainstream entrepreneurs; however, integrating into global supply chains may become a challenge (Jacobsen et al., 2019). Furthermore, indigenous entrepreneurs face challenges similar to all entrepreneurs (Chan et al., 2016; Whitford and Ruhanen, 2014), such as a lack of legitimacy, difficulties in attracting qualified human capital, and difficulties in obtaining funding (Hyytinen et al., 2015). These challenges, along with the desire to operate in ways that fit indigenous culture (rather than the mainstream business culture), may prevent indigenous entrepreneurs from formalizing their enterprises (Hipango and Dana, 2012), which may in turn limit opportunities for growth. Indigenous entrepreneurs may have at their disposal human and knowledge resources, indigenous practices, and indigenous values not available to mainstream entrepreneurs and modes of business (Awatere et al., 2017; Kawharu et al., 2017; Barr and Reid, 2014; Pereiro, 2016).

Indigenous human resources may possess unique knowledge of the local environment relevant to culturally inspired product development (Ratten and Dana, 2015; Erdmann, 2016; Mendoza-Ramos and Prideaux, 2017). Indigenous social networks are often built around extended family, with the family rather than an individual entrepreneur forming the basic economic unit (Dana, 2006). Indigenous entrepreneurs economically empower the indigenous population (Eichler, 2017; Mendoza-Ramos and Prideaux, 2017), empower women (Ratten and Dana, 2017; Zapalska and Brozik, 2017), protect and promote indigenous culture (Henry, 2017), protect the environment (Eichler, 2017; Phillips et al., 2016; Whitford and Ruhanen, 2016), and contribute to revitalizing remote regions (Dana, 2006).

## 3. Fieldwork site and methods

The ethnographic fieldwork was conducted between April 2022 and May 2022 in Bizana Municipality in the Eastern Cape province, South Africa. The 2 months' time frame was adequate for the study. The research site consisted of 4 clusters of villages in Bizana Municipality. Each cluster was predominantly smallholder farmer households. The most crucial factor in selecting the village was based on the number of small operational businesses. With the help of two research assistants and support from communities that hosted us, sufficient data was collected for analysis. Figure 1 illustrate the location of the province in South Africa.

The Alfred Nzo District in the Eastern Cape Province is home to the Winnie Madikizela-Mandela Local Municipality (previously known as the Mbizana Local Municipality). It is one of the four municipalities in the district as shown in Figure 2. South Coastal Boundary of KwaZulu-Natal and N2 highways are connected by the R61 road. In Mbizana, the vast majority of households are farm-based. As a result, people living in rural areas rely on subsistence farming as a means of sustaining themselves. Mpondos, Sothos, and Ngunis are just a few of the many ethnic groups represented in Mbizana, which takes great pride in its rich cultural diversity. The isiMpondo dialect, a soft blend of isiXhosa and isiZulu, is unique to the Mpondo people, who make up the majority of the population. Beautiful beaches and estuaries can be found in the municipality, which is situated between the Umtamvuna and Mtentu rivers. The well-known Wild Coast and Pondoland centre, which is home

to distinctive flora and fauna, includes this coastline in its territory. The municipality was renamed Winnie Madikizela-Mandela Local Municipality on December 1, 2020.




**Figure 1.** Eastern Cape Province, South Africa

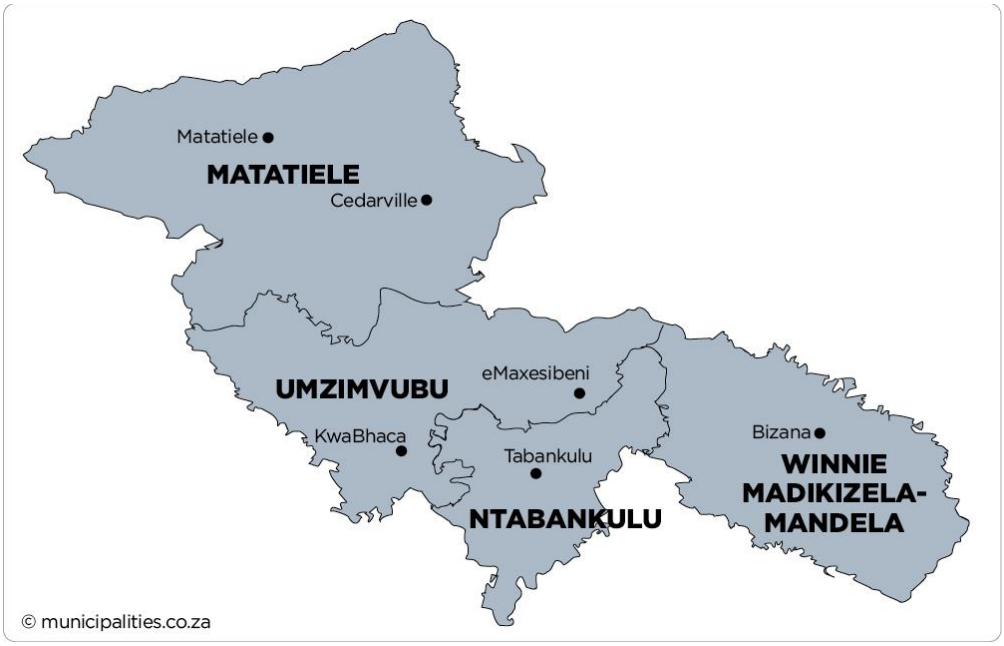



**Figure 2.** Study area map

### 3.1. Choosing participants

The participants for in-depth interviews were referred to as "key participants" and "participants". Key participants are individuals who are considered to be local experts in certain activities or domains by the community, while participants are individuals who are not experts or have little knowledge about the subject. The key participants included small-scale crop farmers and livestock farmers who had expertise in entrepreneurship or market access and mainly produced output for the market. Their ages ranged from 35 to 80 years.

### 3.2. Participant observation

The fieldwork was formally conducted in Bizana Municipality in the Eastern Cape Province for a period of 2 months from April 2022 to May 2022. This time allowed me to observe the complete cycle of farming and entrepreneurship activities and many related activities in the study area.

### 3.3. Data collection

To gain insight into IKS and entrepreneurship activity, ethnographic qualitative data were collected through interviews, observations, and focus groups. Initial contact was made with village headmen to gain permission to interview households. Research assistants from the villages were involved as they were more aware of the indigenous knowledge practiced in the study area. Trips were not limited to the study area, and in certain cases, trips outside the village were made to compare regional differences in agricultural practices, farming systems, and entrepreneurship practiced in those areas.

Each key participant was interviewed separately on their farms or workplace. This also enabled the key participants to provide more detailed responses than it would have been possible if they were interviewed away from these natural settings. The purpose of these interviews was to generate significant native knowledge about the topic under study, which requires many sessions. During the interviews, each key participant was asked to describe the practices involved in intercropping, maintenance, production, harvest, and conservation of crops and livestock. Furthermore, they were also asked about the management practices they used for sustainability. Most of these interviews were conducted on the farms, and a structured interview was conducted on a relatively bigger sample of the population. The interview involved asking a set of questions or topics to establish agreement or variation of cultural domain. The topics were based on the key participant's native categories generated during the participant-observation stage of this study.

Focus groups and interviews were used to refine specific topics related to sustainability to present to community stakeholders. Informal discussions with local entrepreneurs and two University of Fort Hare researchers resulted in the preliminary selection of four topics for discussion: alternative economies, marketing, sustainability, and indigenous knowledge.

**Table 1.** Participants information

| Types of participants | Number of participants | Purposes of discussions or interview | Topic discussed |
|---|---|---|---|
| Crop farmers | 18 | Gain insights into local dynamics surrounding the topics determined by the interviews | Local marketing<br>Perceptions of sustainable agriculture<br>Values, beliefs, attitudes, and goals surrounding business and community priorities, marketing |
| Livestock farmers | 8 | Gain insights on usage of indigenous knowledge in sustainability and business | Indigenous knowledge usage, social enterprises, and business strategies, alternative economies |
| Community stakeholders | 40 | Find out about their views on sustainability and IKS in relation to development | Sustainability, climate change and farming activities |

## 4. Results

This section details the results of the interviews with each group of participants or participants. It is organised into two main topics: (1) perceptions of sustainability and IKS, (2) IKS in agriculture, (3) Perceptions of interactions between farmers and communities. We begin with perceptions of sustainability.

### 4.1. Perceptions of sustainable agriculture and indigenous knowledge

#### *4.1.1. Crop farmers*

The majority of farmers were already familiar with the term "sustainable agriculture" because they were members of an organisation or project that promotes this type of farming. On the other hand, they exhibited a sceptical attitude toward the adoption of organic farming practices in the region. Even though some sustainable practices were discussed in the interviews, it is possible to infer that the farmers' attitudes toward sustainable agriculture as a whole were largely pessimistic as a result of the interviews. On the other hand, many of the farmers who were interviewed noted that other local farmers were beginning to adopt sustainable practices such as the promotion of vertical farming because they saw the economic and environmental benefit, and once these tangible advantages were communicated directly to them.

#### *4.1.2. Livestock farmers*

The majority of farmers (over 60%) were not familiar with the term "sustainable agriculture" because they did not see anything harmful about grazing farmlands. Based on their indigenous knowledge, some disputed the need for sustainability efforts due to the fact that the ecosystem recreates itself. Sustainable agriculture was mainly seen as relevant to crop and vegetable farmers. Careful observation of livestock and wildlife behaviour, knowledge of their "homeland" and landscapes, and day-to-day interaction with pastures, wildlife, and water sources form an evidence base for understanding and making sense of climate variability among Xhosa and

Amampondo herders. Because herding plays such a significant role in Xhosa history, culture, and national identity, there is a widespread celebration of traditional practices and attitudes toward nature across society. This includes celebrations that take place in urban households.

Livestock farmers view the environment as an interactive system, of which indigenous knowledge, local institutions, and governance innovations for adaptation are an integral part. One farmer stated, "this is a system in which the actions and behaviours of humans have an impact on the functioning of the environment as a whole." The land is seen as demanding respect (inhlonipho), and many taboos guide people's interactions with the land. One of these is the prohibition against digging into the ground. The embarrassment that comes along with engaging in small-scale mining activities is a good illustration of this point. Other beliefs of this kind govern the day-to-day interactions that South Africans have with the environment, such as the rules regarding the consumption of water and its conservation. These beliefs are also intertwined with household economies.

When looking at the effect that Xhosa values have on the preservation of the environment, the findings reflect previous research that emphasizes indigenous peoples' responsibility as environmental guardians and the importance of sustainable tourism development (Hillmer-Pegram, 2016; Walker and Moscardo, 2016). Participants expressed an overwhelming responsibility to not only maintain but enhance the natural environment based on the value of ubuntu (togetherness). This led to the importance of creating relationships with multiple stakeholders based on ubuntu to initiate and contribute to environmentally sustainable initiatives on local and national levels. Participants also expressed an overwhelming responsibility to not only maintain but enhance the natural environment.

#### *4.1.3. Community stakeholders*

The majority (Over 65%) of the community stakeholders in Bizana responded that they had never heard of the term "sustainable agriculture" when they were questioned about their thoughts on this type of farming. At least ten of the participants had some familiarity with sustainable agriculture practices and were aware that farmers utilised them. While this was going on, there were only three vegetable farmers who had a proper understanding of the word "sustainable" and what it means in relation to agriculture. In general, their reactions were favourable, despite the fact that their understanding of the term was limited. On the other hand, a number of participants disagreed with the notion that sustainable farmers should be distinct from conventional farmers in any way, arguing instead that it is the responsibility of all farmers to preserve the natural environment. However, the purchase of organic foods is a choice made by consumers and is not motivated by concerns regarding their health. Another respondent shared a similar sentiment, asserting that sustainable farmers were not in any way distinct from traditional farmers; rather, they were simply at the forefront of climate change activism. In the meantime, some of the participants questioned the use of the term "sustainable" as if it meant there would be no increase in terms of yields given that organic farming practices are used.

### 4.2. IKS in agriculture

Indigenous peoples in South Africa have developed and utilised a variety of farming techniques and passed them down orally from generation to generation since the dawn of time. This occurs during a variety of agricultural seasons and periods. The general principles may not be applied uniformly in grasslands and forests, but they are universal. They represent a vast reservoir of knowledge to be mined in our pursuit of

sustainable agriculture. This knowledge encompasses land preparation, tilling, seed variety selection, planting, harvesting, and storage. Since the purpose is household subsistence, farm sizes are typically between 1 and 5 hectares, and social surplus is sometimes produced.

Smallholder production in the study area is characterised by shifting cultivation, crop rotation, mixed cropping, farm fallowing, and slash-and-burn. It is believed that these systems are detrimental to the survival of wildlife, and where they exist, agricultural extension agents have discouraged farmers from implementing them. Terminating human activities such as fires and shifting cultivation reduces biodiversity because they create the terrain patchiness necessary for the survival of more species. Intercropping is a popular and profitable agricultural practice. Intercropping of legumes with other crops is common. Legumes are also planted during the fallow period to enrich the soil. Nitrobacter are used to fix nitrogen in their root nodules (nitrogen converting bacteria). Beans, maize, and groundnut are common crop rotations, followed by amadumbe (Colocasia esculenta). According to the participants, the amadumbe plant is less expensive and more nutritious and an alternative to potatoes. Several families were farming on a small scale and selling their excess to the market. Small-scale farming to meet domestic needs does not have the potential to destroy entire ecosystems; however, the situation is exacerbated by multinational corporations rushing to clear the primary forest and abusing quotas to maximise profits. Bushfires become uncontrollable when forests are cleared. This was the case in villages near Xolobeni, where multinational corporations are at odds with indigenous people over mining rights. Meanwhile, indigenous people have expressed concern that they will lose biodiversity if forests and farmland are converted to mining. Because their ancestors owned the land, the loss of farmland is a loss of heritage. Furthermore, these activities would devastate their graves, which is a cultural quandary itself. The majority of participants were opposed to any exploitation disguised as economic development, stating that they are content with the way they live through farming.

There are indigenous agricultural practices in the region that conserve soil and water while increasing soil fertility for increased crop yields, some of the participants said. Large families and self-help groups provide a steady supply of manual labour for tasks like clearing or slash-and-burn, hand hoeing, seedbed preparation, weed control, and harvesting. In terms of how land is prepared for farming, there is enough documentation, but over the centuries there have been numerously sustainable practices for tilling that have been developed. It is common to practice in this area to cultivate a wide variety of crops on ridges (with or without embedded organic residues).

On plateaus, farmers build flat-top ridge systems; in hilly regions, they use round-top ridge systems. Soil erosion is minimised thanks to the use of contour ridges, and plant growth is enhanced as a result. These indigenous agricultural practices conserve soil and water as well as enhance soil fertility for increased crop yield. Large households and self-help groups provide a steady supply of manual labour for tasks like clearing or slash-and-burn, hand hoeing, seedbed preparation, weed control, and harvesting. In terms of how land is prepared for farming, there is enough documentation, but over the centuries there have been numerously sustainable practices for tilling that have been developed. It is a common practice in this area to grow a variety of vegetables, maize, potatoes, sweet potatoes, and other root crops in raised beds with or without organic residue. Crop residues are lined up across a farm to create trash lines. If done carefully and effectively, they can reduce runoff and increase infiltration. Sorghum and millet clovers, which decompose more slowly and are less appealing to livestock than maize clovers, make up the majority of trash lines. Insects and termites can attack them, but they are also resistant to floodwaters. Water seeps through them because they are permeable.

Decomposition of trash line materials improves soil fertility. In virgin forests, log lines are common on recently cleared farmland. Using the trunks of trees, lines are drawn on the ground, which can then be filled with crop residue or weed seeds. Building log lines have shifted to softwood with low economic value as a result of competition between log lines and charcoal production for sale to street vendors who roast fish, maize and meat. After the terrace has been built, the charcoal from burning hardwoods is sold. Logs can also be damaged by termites and ants. Water can pass through semi-permeable earthen bunds that are used in some areas. Natural benches are created over time by cultivating inter-bund areas. In other African countries, these methods are also widely used. Runoff can be captured and infiltrated by crop roots using retention ditches in sloping areas. Terraces made of earth or stone can also be used to protect and increase the amount of arable land. Compost plant waste and animal manure, such as cow dung, help to keep the soil fertile. Mulching is used to conserve soil and water, maintain soil fertility, and control weeds.

Poor yields were cited as a sign of a decline in soil fertility by ten people who took part in the discussions. The plants growing in the fields could also be felt through their leaves. Wood ashes from kitchens or manure from livestock waste can be used as a remedy in some cases. Chemical fertilisers have a much greater impact on the food chain than biodegradable fertilisers. Nitrogenous fertilisers are applied to cash crops like maize and potatoes. Complaints about the taste of food grown with fertilisers are common. In toxicological studies, toxins from chemical fertilisers have been shown to poison the human body's systems and organs. Non-biodegradable growth-enhancing substances that modern agricultural use is potentially harmful to human health. Genetically Modified Food is widely used in South Africa, making it a global leader in this area. It can be argued that food insecurity is exacerbated by a lack of storage facilities. Furthermore, it is worth noting that indigenous techniques exist, but they're mainly used by the local population and not for large-scale commercialization. Throughout the year, food has been stored in traditional prepared bands and bush sheds. Other storage methods include storing collected seeds in the walls of houses, smoking maize in the kitchen, and using certain plant species to deter weevils. In South Africa, farmers who grow food for urban populations are the poorest.

### *4.2.1. Focus group views of sustainability in agriculture*

A systematic examination of participants' perspectives resulted in three distinct focus groups. Each group was labelled with a name that captured some of their most distinguishing characteristics, based on which types of statements the participant in each group ranked highest on. Environmental Agents were most interested in managing resources in collaboration with nature and reducing pesticide use on farms as a means of improving living and working conditions. They always prioritised the conservation of natural resources over the maximisation of yields. They tended to give neutral ratings to statements about off-farm and community interests, indicating neither strong agreement nor disagreement. Productivity Enhancers approached farming with a more industrial and business-like mindset. They were most concerned with achieving the highest yields and quality ratings and showed the least interest in off-farm activities, whether social or employment-related. Social agents placed a greater emphasis on off-farm activities and social interaction, particularly for information-seeking purposes than formal entrepreneurs. They also demonstrated a strong, business-like cost/benefit approach in terms of time and money when choosing farming practices, possibly due to competing interests off-farm.

The results of the focus group were mixed when it came to sustainable agriculture in general. As an example, six members of the 10-member Environmental Agents group expressed their desire to use more organic practices but using such practices "exclusively" was perceived as too risky for both crop yield and quality. It appears that farmers were split on whether or not "Biological (sustainable) farming is risky," as stated by one group, was a strong agreement or a strong disagreement with other statements asked. In addition, a few farmers in the Social Agents and Productivity Enhancers groups indicated that the practices currently used by the majority of farmers were not excessively harmful and that the majority of farmers were already acting responsibly towards the environment. Biological farming has a wide range of opinions, which indicates that farmers' definitions of "sustainable" and "harmful" are not established. Economic considerations can also limit farmers' ability to implement an optimally environmentally friendly farm management strategy, even if they have different views on what is sustainable and what should be prioritised.

## 4.3. Perspectives on the relationships that exist between farmers and their communities

Farmers and community members lacked sufficient understanding of sustainable agriculture, making it difficult to link sustainable farmers with their surrounding areas. As a result, we focused on the importance of involving all farmers and the communities in which they live.

The interviewed participants indicated that farmers seem to interact mostly with other farmers and people directly involved in agriculture and much less so with anyone outside of agriculture. Moreover, some farmers spoke about the possibility of ‘‘negative’’ interactions that might develop with residents of rural areas who found the noise and odour of some farming practices offensive.

### *4.3.1. Protecting agricultural land*

Concern was expressed by several crop farmers in Bizana about the rapid reduction of farmland. Those who had been annexed into a city or forced to give up their lease on land when it was bought for development had felt the effects first-hand. There is a land dispute between mining companies and the residents of Xolobeni village. Undeveloped beaches, titanium-rich dunes, and forests filled with rare plant species that cannot be found anywhere else in the world can be found in this breath-taking region of the world. Meanwhile, there was little evidence that farmers had contacted anyone else about the protection of farmland, and even fewer that they had even been aware of any efforts to do so. However, even those who were members of the farmer organisation admitted that they were not involved in any way and had no idea what the organisation had accomplished in terms of farmland preservation.

This suggests that while many in the farming community may be aware of larger-scale factors that are contributing to the loss of farmland, they may not be actively participating in local efforts to counter these forces. Farmland conversion trends, according to some, are simply overwhelming, given the amount of land being lost each year as "absolutely frightening." As another observer pointed out, given the increasingly difficult financial times farmers find themselves in, as well as rising debt and taxes, it is easy to see why they might be tempted to sell out to developers. A few more positive notes contrast with these views of non-involvement, however. The preservation of farmland was mentioned by several participants, particularly in Xolobeni village, where these issues are more pressing.

### *4.3.2. Poor communication*

A lack of communication between farmers and the public that consumes their product was cited by crop farmers. In addition, they expressed a general sense of helplessness in the face of the market's complexity and the time, energy, and expertise required to be successful through traditional marketing channels. Most farmers preferred to delegate all marketing responsibilities to their vendors rather than conduct their own research into available opportunities. Farmers who were not selling their produce were aware of the difficulty of keeping track of and predicting the market. Stakeholders in the community shared the farmers' view that many people see farmers as isolated from the rest of society, which can be harmful for them. Farmers tend to work within their own circles and have no interest in collaborating with others. Only a small percentage of people will participate in non-agricultural community events. There is a perception that urban residents lack a basic understanding of agriculture because they lack community involvement, among other factors. Most of the people interviewed said that urban residents lack a basic understanding of the importance of agriculture and its role in their local economy. Businesses, for example, may not be aware of the local multiplier effects of the indirect contributions they receive from local farmers in the form of wages to workers and payments for goods and services that circulate in the local economy. Public planning processes are not being used because people are not aware of the importance of preserving prime farmland, say some stakeholders.

Ideas like increasing sales to local markets and creating a regional identity for locally produced goods were supported by 75 percent of participants. Though this enthusiasm appeared to be focused on direct marketing as part of agricultural tourism in all villages, it seemed to be aimed more at enhancing local farmers' ties to their communities. Conflicts between government and local communities have become increasingly common in this area. Since the discovery of various minerals, such as titanium, Xolobeni has become a popular tourist destination.

### *4.3.3. Agribusiness and community involvement*

In agribusiness interviews, farmers' markets, farm stands, and community-supported agriculture are on the rise. There were no questions about farmland preservation or local marketing asked of the farmers participating in the interviews compared to those asked of the previous participants. The agribusiness interviews revealed that some farmers are more involved in community activities than others, just like in the farmers and community stakeholder interviews. People who identified as Productivity Enhancers tended to be the most production-oriented and the least inclined to participate in extra-farm social activities. "If you are a farmer, you should focus on that," one farmer said." Productivity Enhancers were also found to be more secretive, competitive, and reluctant to share information with their peers, according to their statements. Social Agents, on the other hand, were characterised by a strong focus on community involvement and off-farm activities. They appeared to be looking for a more well-rounded way of life and seemed less willing to let farm concerns take precedence over everything else in their lives, including their personal, family, and community ties.

One farmer acknowledged that his ability to influence issues was limited without community involvement and that community work can ultimately have a positive impact on his business. Many of these farmers also work in other fields, increasing their ties to non-farm organisations. Environmental Agents fall somewhere in the middle, showing neither a strong dislike for nor a strong preference for community involvement. Some

members of the group, however, emphasised the importance of giving back to the community and cultivating a positive image and good community relations for farmers. One farmer acknowledged that his ability to influence issues was limited without community involvement, and that community work can ultimately have a positive impact on his business. Many of these farmers also work in other fields, increasing their ties to non-farm organisations.

## 5. Discussions

The results of this study show mixed progress around sustainable agriculture and community development in the local community. It has been suggested in some of the interviews that rural communities lack the social capital needed to solve local problems, but it has also been suggested that some farmers are already deeply involved in local issues. All farmers – conventional and more ecological – differ in their priorities when it comes to both farm management and community involvement, according to the data gathered from this study. Also, the use of indigenous knowledge seems to be limited to the farming and not beyond.

Focus group results show that all farmers, including ecological farmers, range from highly involved in community affairs to very private and strongly farm-focused at the other end of the spectrum of engagement. As a result, an interest in farming ecologically or sustainably does not necessarily imply a willingness to engage in civic activities. Many farmers in the Bizana are not interested in integrating community sustainability into their businesses because they see it as a waste of time and money. This is a major factor in the disconnect. Maize and potatoes, for example, are not staple foods, so when a large number of farmers all produce the same crop, they must rely heavily on exports out of the region. Even if the farmer employs more environmentally friendly practises, this restriction applies to them all. It is unlikely that local and regional markets will be able to accommodate the current high volume of these crops.

Farmer's markets and other forms of community supported agriculture (CSA) rely on a wide variety of small-scale, regular production of a wide variety product, and farmers who want to take advantage of these opportunities need to expand their operations and learn new skills such as customer service. A common problem for small-scale farmers is that they lack the necessary tools and knowledge to handle this. Farmers who want to capitalise on their unique identities as sustainable farmers by marketing directly to consumers do not necessarily target local markets, as we have seen. Farmers can establish a presence among international buyers and consumers through the use of modern communication and transportation technologies. There is no guarantee that a rise in the number of ecologically oriented farmers in the Bizana will lead to a rise in local marketing opportunities for all of those farmers, regardless of market constraints, lack of farmer skills or farmer orientation toward local marketing. Despite this, the views of local residents suggest that there is still room for local farmers to be more fully integrated into regional marketing. Increasing the visibility of even a few eco-farmers could have a positive impact on all of these farmers as a whole. For farmers who cannot or do not want to sell directly to their neighbours, there are other ways to build stronger ties to the community. Farmers can contribute to their communities in a variety of ways, such as participating in farmland preservation efforts, agritourism, and public education efforts through schools and other organisations. Despite this, community members and farmers alike report that most farmers avoid participating in these kinds of endeavours. Key farmer leaders who can speak about sustainability issues could help educate non-

farmers about the importance of agriculture to the regional economy and how caring for natural resources is important for long-term profitability once more.

While evidence suggests that sustainable agriculture in Bizana does not necessarily lead to more local marketing, the converse also seems to be true. Where local marketing initiatives do exist, they do not necessarily focus only or even primarily on products produced by ecologically oriented farmers. When they do include certified organic producers and/or ‘‘low input’’ producers, these producers usually constitute only a fraction of the total producer participants, and there are usually no additional educational or publicity activities associated with them. Moreover, while it is tempting to suggest that ecologically oriented farmers should seize the opportunity to add value to their product by establishing strong identities as ‘‘sustainable’’ producers in local markets, there are few if any successful examples of price premiums for ‘‘green labels’’ outside of the organic industry.

Sustainable farming is still in its infancy, and the lack of agreement on what it means is likely to be one of the reasons why it has taken so long for ecological farmers to begin marketing their crops as "sustainable." There is a lack of clarity among consumers and growers, as evidenced by the study's interviews with each of the three groups of participants. Based on environmental considerations alone, the assumption that one could distinguish "sustainable" and "conventional" farmers was found to be incorrect. Unpublished research relating to this study indicates that even on a purely empirical level, such a distinction is difficult to achieve, as individual farmers adopt some sustainable practises but not others, and their mix may change year to year as regulations, economics, and natural conditions constantly change. The economic and social aspects of sustainability were not mentioned even by those interviewed who showed some understanding of environmental sustainability in farming.

These observations suggest that a single blanket term like ‘‘sustainable agriculture’’ is inadequate to marshal support for a multi-pronged and constantly changing movement that embodies diverse goals. Rather than debating semantics, we believe that the public's lack of understanding of sustainability can be alleviated in part by providing more opportunities for people to interact directly with farmers who are committed to it. Even though direct marketing and agritourism may be important for keeping farm profits in the community from a purely economic standpoint, we believe that the advantages of such farmer-community contacts go far beyond this. It is possible to build "communities of interest" around sustainable agriculture by allowing members of the community and the public to interact directly with farmers. Through direct and indirect contact with farmers, these groups will become more concerned about supporting local farmers, not only through direct consumption choices, but also by advocating for long-term policies that support sustainable agriculture. Caring for others is a valuable form of social capital in and of itself. Furthermore, the civic engagement with sustainability issues that could result from building such social capital in local communities would be the ultimate benefit of such efforts.

Farmland preservation is a topic that affects all types of farmers, so forums can draw a diverse group of participants, including both conventional and alternative farmers. By using common concerns about land use planning to build bridges between sustainable farmers and the larger farming community, these events could be useful venues for integrating the two groups. In addition, sustainable farmers can help a local community's desire and capacity to advocate for farmland preservation by highlighting the environmental and community services provided by their farms, such as better wildlife habitat and cleaner drinking water. Agritourism and local marketing are two strategies that can help boost local economies. Farmers are already using new

marketing techniques to connect with consumers in more personal, identity-preserving ways while also promoting a better understanding of sustainable production methods.

## 6. Conclusion

Results presented here show a connection between the environmental and socioeconomic status of Bizana farms and communities, but they also show that many people and organisations can work together to make this connection stronger. Indigenous knowledge systems are one avenue which can enhance this connection due to the fact that it consists of well-proven methods. The majority of participants highlighted that IKS is used in farming and is limited used when selling products to the market. This makes sense in that people's preferences are very dynamic and subscribe to time evolution.

One of the biggest obstacles to the further development of these links is undoubtedly the commodity export orientation of agriculture in this area. A few more research questions arise because this fundamental factor is unlikely to change anytime soon. How large a percentage of farmers in a given community or region must be in order to ensure an adequate capacity for public education and social capital-building? Further research should focus on the specifics of how to help farmers who are interested in transitioning to more local marketing. What are the best crop mixtures for maximising farm resources while also appealing to local consumers?

Finally, how can local food systems profitably utilise the large labour force already employed in agriculture? If underemployed agricultural workers can be helped to develop their skills in small-scale direct marketing and agritourism, for example, grants and loans for small business owners could be an effective way to help the local economy while also benefiting the underemployed workers themselves. Environmental and community sustainability are intertwined issues, and those who support ecological agriculture and community development must work together to create larger communities of interest capable of marshalling the social, political, and economic support needed to address these issues.

## Declarations

### Ethics approval and consent to participate

The study was approved by the UREC, University of Fort Hare.

### Conflict of interest

The authors declare no conflict of interest.

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