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## The holistic management concept in rearing Nguni cattle: a way out for sustainable agriculture and minimizing rural poverty?

### Abstract

This study explores how the *holistic management* concept is being applied by the Tiger Kloof Educational Institution to ensure sustainable agriculture in rural South Africa. *Holistic management* in sustainable development provides benefits in three areas of development, which are the environment, economic and social. Before the advocacy for what is now referred to as the triple bottom line principle, businesses would only consider the economic aspect of doing business, which has proven to be unsustainable in most instances. The Tiger Kloof Educational Institution is applying the *holistic veld management* in practical farmer training on Nguni cattle to promote and maintain biodiversity, improve water and mineral cycles and rear cattle that are purely grass-fed thus leading to low cost production. There are health and poverty reduction benefits that are noticeable in the surrounding towns and villages. The study uses the case study design to ascertain how the *holistic management* principle that is being applied at the institution is ensuring sustainability. The findings indicate that *holistic management*, as applied at the institution, meets the triple bottom line criteria that can be replicated in other rural communities in South Africa and elsewhere to ensure sustainable development.

**Keywords:** biodiversity, development, holistic management, Nguni, sustainability.

**JEL Classification:** Q57.

### Introduction

This paper is a case study of the concept of *holistic management* in practice in the context of sustainable development. Specifically, the paper explores how the holistic management concept is being applied by the Tiger Kloof Educational Institution to ensure sustainable agriculture in rural South Africa. The application of concept of holistic management in sustainable development provides benefits that lead to development at the environmental, economic and social level. In the paper, the authors discuss how the Tiger Kloof Educational Institution is applying the principles of *holistic veld management* in practical farmer training on Nguni cattle and organic farming to promote and maintain biodiversity, improve water and mineral cycles in the soil and rear cattle that are purely grass-fed thus leading to low cost production at the same time ensuring sustainable farmlands for a prolonged time than would normally be the case.

Regarding the organic farming part of the Tiger Kloof Educational Institution's project, it is important to highlight that the Henry Doubleday Research Association (HDRA) (1998) describes organic farming as an approach that works in harmony with nature rather than against it. These authors also add that organic farming involves using techniques that achieve good

crop yields without harming the natural environment or the people who live and work in it.

### 1. The problem

Henry Doubleday Research Association (HDRA) (1998) strongly believes that the advocacy for organic farming includes: increasing long-term soil fertility; pest and disease control without harming the environment; ensuring the safety and purity of water; making use of locally available resources to minimize cost; and producing nutritious food for people, food for animals and high quality crops to sell at good prices.

All of the above farming practices are clearly means of containing the rapid depletion of non-renewable natural resources and other man-made problems such as climate change, environmental pollution and so on – all of which are no doubt issues that impinge on sustainable development.

**1.1. Purpose of the study.** With the above background in mind, the purpose of this study was, to explore how the *holistic management* concept is being applied by the Tiger Kloof educational Institution to ensure sustainable agriculture in rural South Africa.

**1.2. Research questions.** The study is guided by the following specific research questions:

1. How is the holistic management approach being used to rear Nguni cattle at Tiger Kloof?
2. Why did the Tiger Kloof Education Institute opt for Nguni cattle as their project?
3. How does the project ensure sustainability?
4. How does the institution balance the three issues of the environment, social and economy of the project?

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## 2. Literature review

### 2.1. The need for sustainable agricultural practices.

As Smith and Perks (2011, p. 1) intimate, that the effects of climate change, along with pollution and the depletion of non-renewable natural resources, have created environmental awareness. The environmental awareness campaign entreats businesses and all other forms of organizations to go green to ensure environmental sustainability alternatively referred to as sustainable development – development that generates wealth and meets the needs of the current generation while saving the environment for future generations (Daft, 2008, p. 154).

Meanwhile, the impacts of climatic change are being felt across the globe. Nellemann et al. (2009) point out that from an environmental perspective, ecosystems are under severe stress in many areas of the world and that the impacts of climate change are exacerbated by increasing populations and consumption levels.

According to Carroll and Buchholtz (2000, p. 57), the King III Report addresses the issue of sustainability in terms of the triple bottom-line concept of economic, social and environmental sustainability. Nevertheless, it is a concern around the world that most of the good agricultural land has been excessively farmed and the availability for further farming expansion curtailed and virtually exhausted.

There is also increasing pressure across the world for commitment to the provision of clean energy and environmental solutions in the face of increasing urbanization, industrialization and population pressures. Sustainable agriculture is touted as a means to addressing higher crop yields and increased income with a limited negative impact on the environment. According to Pyakuryal (2011, p. 22) sustainable agriculture integrates three main goals – environmental health, economic profitability, and social and economic equity. Some of the ways by which sustainable agriculture can be attained include integrated pest management; rotational grazing; soil conservation; water quality/wetlands; cover crops; crop/landscape diversity; nutrient management; agro-forestry and marketing.

Organic agriculture is being promoted as a means to address some of the challenges mentioned above with regard to agriculture. The International Federation of Organic Agriculture Movement (IFOAM) (2011, p. 3) defines organic agriculture as “a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared

environment and promote fair relationships and good quality of life for all involved”.

Binns (2012) acknowledges some of the challenges facing agriculture today as including declining and falling productivity, developed countries’ dependence on agriculture subsidies, increasing use of agro-chemicals, agriculture being one of the major cause of biodiversity loss, water pollution and between 13-15% of global greenhouse emissions coming from agriculture as a result of heavy reliance on nitrogen fertilizers. Binns (2012) however acknowledges that there is evidence to support the view that sustainable agricultural production systems offer viable alternatives to the existing unsustainable farming practices. Binns (2012) adds that sustainable agriculture, which includes organic farming practices, offers greater opportunities for competitive returns, the support of essential and life-supporting ecosystem services, the creation of decent jobs and livelihoods, smaller ecological food prints, increased resilience to climate change, and enhanced food security.

Before the advocacy for what is now referred to as the triple bottom line principle, businesses would only consider the economic (profit) aspect of doing business which has proven to be unsustainable in most instances. The Tiger Kloof Educational Institution is applying the principles of *holistic veld management* in practical farmer training in Nguni cattle to promote and maintain biodiversity, improve water and mineral cycles, rear cattle that are purely grass-fed thus leading to low cost production. There are health benefits as well poverty reduction in the surrounding towns and villages.

As a result, the paper, using the case study design, seeks to ascertain how the holistic management principle that is being applied at the institution is ensuring the project’s sustainability. The finding indicates that the holistic management principle, as applied at the institution, meets the triple bottom line criteria that can be replicated in other rural communities in South Africa and elsewhere to ensure sustainable development in communities.

### 2.2. Overview of the holistic management theory.

Holism, according to Savory (2013), is the operating principle in nature that purports that nature functions in wholes and patterns of great complexity, unlike the mechanistic world view in which nature is viewed as a complicated machine with interconnecting parts. The theory is partly credited to Jan Christian Smuts who, in *Holism and Evolution* (1926), outlines the systems theory and puts emphasis on process-orientation, hierarchical view of nature and the non-preformationist and unified interpretation of inorganic and organic evolution. Poynton (1987, p. 181) argues that Smuts’ idea of holism is very close to the Oxford Dictionary’s definition of

holism, which states that ‘the whole is greater than the sum of its parts’. Smuts (1926, p. 100) also examines the concept using a living organism as ‘a natural whole’ and elaborates that “the organism consists of parts, but it is more than the sum of its parts, and if these parts are taken to pieces the organism is destroyed”.

Holistic management is linked to decision-making that seeks to achieve economically, socially and environmentally sound objectives and results. Citing Savory and Butterfield (1999), Isele and Kulbs (2013, p. 56) suggest that the organic management decision-making framework, common in holistic management, generally includes a high level of awareness of sustainable use of resources and improvement of biodiversity, while simultaneously managing towards profitability and the well-being of people involved. Savory (2013) notes that the theoretical base of holism suggests that land alone, for example, is not manageable as it is tied to the culture, beliefs and values of the people who occupy it. In effect, the practical management of land involves the management of wholes in which land is involved and could be done by viewing people, their land and the economy as one indivisible whole. Holistic management, thus involves using a simple decision-making framework that ensures all their significant management decisions are simultaneously economically, socially and environmentally sound both in the short and long term (Savory, 2013).

In effect, holistic management in agriculture refers to a whole farm planning system that assists farmers to manage agricultural resources better in order to reap sustainable environmental, economic and social benefits. Barrow, Binding and Smith (2010) suggest that farms that are run according to the holistic management principles and procedures “present themselves well for conversion to organic production”. Applying the holistic management principles, Dugmore (2012) echoes Allan that “soils, plants and animals develop together and need to be managed together in socially, environmentally and economically sound manner. Holistic farming sets out to achieve this”. Allan avers, for example, for grazing and plant recovery related to time, which takes into consideration the number of days the plants are grazed and the number of days before they are grazed again. Meanwhile Lesoli (2011, p. 41) observes that natural ecosystems have been destroyed because of anthropogenic disturbances, unreasonable utilization, and neglect of protection and restoration. He is of the view that disturbed and degraded ecosystems are confronted with poor soil fertility, shortages of water and deteriorated microenvironment, which severely restrict their productivity.

These considerations on holistic management therefore have a bearing on the sustainability and profitability in various agricultural ventures.

A consideration of the concept of holistic management in the rearing of Nguni cattle becomes pertinent here. An application of the holistic management principle in rearing Nguni cattle limits negative environmental effects on the environment such as pollution, and reduced the use of excessive fuel and energy consumption. Karvey (2014) adds that consumers are increasingly showing their preferences and spending in support of sustainable and eco-friendly red meat production practices in pursuit of a cleaner and greener planet. Karvey (2014, p. 52) notes that evidence from the USA’s Department of Agriculture and Clemson University in South Carolina found that beef from cattle reared on the veld: is healthier than that of grain-fed cattle, lower in total fat than that of feed lot cattle and lower in saturated fats; contains more beta carotene, vitamins E, B1 and B2, calcium, magnesium and potassium, and more CLA (conjugated linoleic acid) – a potential anti-carcinogenic; and has a high percentage of omega 3 fatty acids, and a healthier omega 6: omega 3 fatty acid ratio (1.65:4.84). Karvey (2014) is also of the view that the Nguni’s natural hardiness, adaptability and disease resistance make it one of the most suitable breeds for grass-fed beef. This view is shared by Joubert (2013, p. 57) who after interviewing Ted and Liz Reilly’s two Swaziland and Nguni cattle farmers, concluded that Nguni cattle are well adapted to the environment in the Southern African region and have a high economic potential as they are the most efficient breed that converts grass to beef under African conditions. On rearing Nguni cattle under the holistic management principle, Joubert (2013, p. 58) quotes Ted and Liz Reilly as having said: “we don’t exceed the carrying capacity of the land” and “a good principle in veld management is the Australian saying: “full stock is half profit; half stock is full profit; over stock is no profit”.

The application of the holistic management theory at Tiger Kloof Educational Institution in rearing Nguni cattle is considered relevant as a theoretical base for this paper as it addresses environmental, economic and social issues in a holistic manner. This holistic approach can be replicated in most rural areas in order to address some of the encountered socio-economic and environmental challenges. Consumers are, as observed by Karvey (2014), increasingly showing their preferences and spending in support of sustainable and eco-friendly red meat production practices in pursuit of a cleaner and greener planet. A holistic veld management takes

into account the best practices in ensuring that the negative impact of cattle production is minimized. On the economic front, Joubert (2013, p. 58) again referred to Ted Reilly's view that Nguni has great potential when compared to the other commercial breeds which die more easily, need more food, and drink more water. Ted and Liz Reilly suggest that rearing Nguni cattle minimizes dipping and veterinary treatment requirements, which makes it very cost effective, and allows the ability of health heifers to breed at 14 months while cows calve once a year and that the Nguni cattle is the most efficient breed at converting grass to beef under African conditions.

The use of the holistic approach which is part of sustainable agriculture helps in addressing social problems such as poverty, malnutrition, unemployment and inequality. The United Nations Food and Agriculture Organisation (FAO) (2011, p. 12) points out that agriculture accounts for between 30 to 60 percent of the gross domestic product (GDP) of a lot of countries in the third world while accounting for between 40 and 90 percent of the labor force in those countries. The FAO and for that matter the United Nations, therefore, acknowledges agriculture's potential and power to poverty reduction.

## 2. Research methodology

**2.1. Research design.** The case study design used in this study is based on the qualitative method. The researchers used in depth-interviews, observations and questionnaire and document analysis to solicit the views of the farm manager, the director of the school, two farm assistants and beneficiaries of the farmer training program at Tiger Kloof on the use of the holistic management approach in rearing Nguni cattle as a way of ensuring sustainable livelihoods in the Vryburg area. Denscombe (2012, p. 52) intimates that the defining feature of case study approach is its focus on just one instance of the issue that is being investigated. He adds that occasionally, researchers use two or more instances but, in principle, a case study focuses on individual instances rather than a wide spectrum. Some of the strengths of the case study approach, according to Denscombe (2012, p. 54), include allowance for researchers to use a variety of sources, a variety of types of data and a variety of research methods as part of the investigation.

**2.2. Research approach.** The researchers employed the phenomenological approach, in this exploratory study, to gather data from the respondents on the use of the holistic management approach in the rearing of Nguni cattle. The respondents to this exploratory study were from the institution and included farmers who had benefited from program. The phenomenological approach was used because it allows the respondents to describe and interpret experiences of

the phenomenon as being lived. The phenomenological study also attempts to understand people's perceptions, perspectives, and understanding of a particular situation (Leedy and Ormrod, 2005).

**2.3. Data collection.** The researchers spent three days, in August 2014, collecting data at Tiger Kloof Educational Institution. The purposeful sampling technique was used to solicit the views of the participants on the application of the holistic management approach in vegetable production and the rearing Nguni cattle. Purposeful sampling is a technique in which particular settings, persons or events are selected deliberately in order to provide information that cannot be obtained from other choices (Wilson, 2010). The research participants here are the director of the institution, the farm manager, two farm assistants and three emerging farmers from the neighboring communities who have benefited from the institution's farmer training in holistic management. The interviews took place at Tiger Kloof for the participants from the school (the director, farm manager and farm assistants) and in the homes of the emerging farmers at their respective homes where they cultivate their vegetables at the times they indicated were convenient to them. The farm manager completed a detailed questionnaire on how the approach they use in rearing the cattle conforms to the holistic management principle. Individual interviews were conducted with the participants. Permission was obtained for the researchers to record the interviews on audiotape. The responses from the data collection were categorized and analyzed, thus leading to the development of themes. The institution also made documents and records that had been compiled since the inception of the project available for analysis. Some of the documents include the training sessions conducted for the workers and emerging farmers on holistic management, the demarcation of the plots, rainfall patterns, the type of vegetation, the number of animals and input costs.

## 3. Results and discussions

All the respondents indicated that the holistic management approach is fully practiced through the farm manager who has undergone training in the approach; providing training to the workers and the emerging workers on the approach as well. The farm manager has been a practitioner in holistic management for over 10 years and gained considerable experience in the field. The use of the holistic management approach has assisted the institution to empower the workers through the acquisition of skills for the production of beef for the school's kitchen all year round and taught the workers good farming practices that have saved the institution on production

costs and enabled environmental conservation. This, they claimed, has saved them money and reduced the running cost of the boarding house, which is one of the major cost drivers at the institution.

The responses from the participants, the observations, document analysis and experiences were categorised and developed into themes to assist the researcher to answer the study's research questions. The themes that emerged include what holistic management entailed and its application at the institution, why Nguni cattle was opted for, applying the holistic management approach to ensure sustainability and the challenges the programme faces.

**3.1. Theme 1. What is holistic management?** The farm manager explained the principles on which holistic management is based this way:

*My understanding of this whole thing is that you should take care of the land and the land will take care of you. We are in sustainable business healing the land, producing food to ensure food security, addressing social and economic challenges and inculcating a certain culture among our people.*

The farm manager illustrated how they now conserve water; avoid using expensive chemicals and using the micro-organisms in the environment to produce vegetables and rearing their animals. He echoed:

*We rear this indigenous breed according to seasons that allow the animals to grow naturally and in healthy conditions to avoid expensive artificial inputs through our veld management that is based on a pasture rotation system that allows nutritious grass to grow. These ensure that animal waste and movement allow the land to be maintained and recover.*

The farm manager and the workers took the researchers around the field. The veld has been demarcated into an average 40 and 53 hectare plots that are neatly fenced and have water holes at various points. The manager and workers explained how the animals are moved during certain times of the week to allow the grazed paddock or plot to be rested for some weeks before bringing the animals back.

The farm manager and the assistants also indicated that the movement of the animals on the plots depended on the seasons, with the animals grazing in a plot in winter for a maximum of seven days and in summer for four days. The camp is then rested for at least 90 days to recover. One of the farm assistants pointed out that:

*The approach allows the grass to recover well due to what hoof action and the animal waste which all contribute to maintaining biodiversity. It is not the number of animals that cause problems for the environment per say as argued by some observers but*

*more of the time the plot is grazed and the time it rested before the grazing period. We learnt this from Savory and have found it to be true.*

These observations confirm Savory's (2013) argument that overgrazing is a function of time and not animal numbers which according to him contradicts the myth in range science that overgrazing is caused by too many animals. This view is supported by Joubert (2013, p. 58) who confirms that holistic management practitioners who rear Nguni cattle should follow the Australian principle which states that "full stock is half profit; half stock is full profit; over stock is no profit".

The researchers observed that large tracks of land were lying fallow and the workers explained that the land was being rested for a specified period before returning it again to the animals. In fact we also observed that the vegetation/grass at the area where the animals grazed looked well covered and green than the vegetation outside. This observation is in line with the views by Wayne Knight, a grazing expert, as revealed in an interview by Bezuidenhout (2012, p. 54) that, his secret in managing his veld and animals is based on "bunching" herds and then allowing enough time for grass to recover between grazing periods. According to Bezuidenhout (2012), there are four key natural components that govern the veld, which are soil organism, grass, grazers and pack hunting predators. Bezuidenhout (2012) argues that by mimicking the interactions between these elements, one is able to maximize the carrying capacity.

The farm manager explained that they were practicing conservation agriculture which also falls under holistic management. He acknowledged that crop production and animal husbandry around the world contribute to greenhouse gases, but noted too that they were doing their best to minimize the greenhouse effects. He noted that:

*Our approach, using the holistic management principles helps in reducing CO<sub>2</sub> emission as a result of incorporating organic materials into the soil during the grazing and movement of the animals.*

This view supports Hittersay's (2012, p. 60) assertion that climate change negatively impacts on agriculture, although it has been noted that the sector also influences climate change through its estimated 12% contribution to the total greenhouse gas (GHG) emissions.

**3.2. Theme 2. Why Nguni cattle was opted for?**

All the farmers who received the training and took part in the research indicated that rearing Nguni has helped them to provide meat for their households, their communities and the school, thus providing

protein for the kitchen and the staff at Tiger Kloof. Various arguments have been advanced by interested parties about the role of Nguni cattle, especially when reared through the holistic management approach, in addressing socio-economic and environmental challenges.

One of the assistants indicated that:

*These animals are small in size but they can defend themselves well against jackals and other animals that attack them. We have on a number of occasions found the carcasses of such animals where we leave them to graze.*

This observation is in line with Joubert's (2013, p. 58) observation that Nguni's can tolerate predator pressure as long as they are not dehorned. The farm manager also mentioned a number of advantages that Nguni cattle have. He pointed out that:

*We had a terrible drought around this area last year where most of the commercial farmers had to go as far as KwaZulu-Natal to look for fodder including sugarcane fodder while others had to cull some of their animals, but our Nguni cattle survived on the little vegetation that remained. We only got some little licks to supplement the vegetation that was available. No other breed will survive that. Besides that Nguni cattle does not need to be treated with expensive veterinary drugs. They calf and breed faster than the other larger breeds.*

The views of the farm manager are backed by other researchers and practitioners such as (Dugmore, 2012; Joubert, 2013; and Savory, 2013) who note the advantages Nguni cattle have over other breeds. The director of the school confirmed that the institution was sceptical when it had to give funds for the initial 50 animals in March 2010, but the school has slaughtered 50 animals to supply the kitchen and has 191 animals to date.

The farm manager reiterated that:

*We are basically increasing our stock by one third each year which no other cattle breed can do easily. In ordinary business circles, especially during these hard economic times, very few businesses are able to increase turnover by one third annually.*

The views shared by the director of the school and the farm manager are supported by evidence from practitioners who rear Nguni cattle on the holistic management principles. Coleman (2013, p. 48), for example, points out that evidence from various studies on farmers rearing Nguni cattle through the holistic management approach, shows that Ngunis are resistant to *heartwater*, *redwater* and *gallsickness*. According to Coleman (2013, p. 49) who interviewed Van Niekerk of the Ganna Ngunis, Ngunis

are horned and thus able to fend off predators easily. He added that the small-framed Nguni cow weans relatively easier than heavy calves. Besides, it is very fertile, presents no calving problems and gets along with minimum labor, veterinary care, parasite control and lick. According to Coleman (2013, p. 49), Van Niekerk explains further that rearing Nguni under the holistic management principles makes economic sense as a study at the Mara Research Station in Limpopo found the Nguni on top when compared with the other meat production potential of small, medium and large-framed cattle since it produced the most kilograms of calf weaned per 100 kg cow mated. The study also found out that Nguni cattle had the highest rate of calving and lowest mortality rate. Some of the advantages of Nguni cattle are confirmed by Joubert (2011, p. 34) who reiterates that the breed is popular among cattlemen because of its fertility and tolerance to a harsh environment as well as tick-borne diseases and cultural values.

The following Table shows how the Nguni cattle is compared with the other breeds nationally.

Table 1. Nguni cattle versus other breeds

Criterion	Ganna Nguni herd	National hear (all breeds)
Number of cows (herd size)	382	340
Average cow weight at weaning (kg)	403	500
Average calving percentage	96	87
Average weaning weight (205 days) (kg)	189	216
Average calf: cow ratio (%)	46.9	43.2
Income (Rand) @ R14/kg (weaners)	843333	767491
Income (Rand) @ R23/kg (Grade C)	208552	230000

Source: Coleman (2013, p. 51).

It is evident from the table above that Nguni cattle perform far better in almost all the criteria above that include land use, weaning, calving cow ratio and income on weaners.

**3.3. Theme 3. Ensuring sustainability.** At Tiger Kloof the director explained that the institution applied the holistic management approach to ensure that the institution addresses most of the environmental issues at all the stages of its development. It was noted that this will ensure sustainable development as holistic management ensures that the farming enterprise does not exceed the carrying capacity of the environment.

The farm manager was proud of the institution's chosen position on sustainable development. As a result, he ensured that the issues of the environment,

social, economic and health matters are addressed through the school's holistic management approach. The farm manager said that:

*We apply the holistic management approach by taking care of our environment by ensuring that in the rearing of the animals, we minimize the negative impacts on the environment as much as possible so that the ecosystem is balanced. We make the animals to graze at the camps for short periods of time and allow them to rest for at least 90 days to allow the vegetation/grass to grow healthy for the animals. We use the available local resources at our disposal to avoid using artificial inputs which can have negative impact on the environment.*

He added that the institution also trains emerging farmers through permaculture, which is part of holistic management that assists communities to address the challenges of poverty, inequality, and unemployment and food insecurity. In addition, the school's vegetable garden assists the institution in running various soup kitchens around Vryburg. The holistic management approach in effect ensures sustainable development by addressing social, economic and environmental challenges.

The concept of sustainable development as enunciated by the World Commission on Environment and Development (WECD) (1987) in its Seminal work, *Our Common Future* has shifted focus on sustainable development for governments, environmentalist and industrialists with regard to the exploitation of natural resources and the political economy of production and consumption of goods. WECD advocates for a balance between growth/profit and ecological protection, which results in the shifts in debates on issues of sustainable development between the different stakeholders (Natufe, 2001). The WECD defines sustainable development as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Quinn and Baltes (2007, p. 3) intimate that leaders are of the view that taking care of profits and the planet are critical to organizational success now and in the future. Quinn and Baltes (2007) add that sustainability can be viewed through the TBL lens which "focuses organizations not just to on the economic value they add, but also on the environmental value and social value they add – and destroy. The three lines accordingly represent society, the economy, and the environment. Society depends on the global ecosystem, whose health represents the ultimate bottom line."

**3.4. Theme 4. Challenges.** The institution has the facilities that can be used to train the youth in the holistic management approach in rural areas. How-

ever, budgetary constraints mean that this laudable idea cannot be extended to potential farmers.

Applying the principles of holistic management requires investment in infrastructure, training and other resources, but institutions such as an NGO have limited resources at their disposal to implement the programs. The director indicated that the institution has approached some government departments, some parastatals and private sector organizations for them to partner and promote this approach but not much has been come out of the initiatives.

He lamented that:

*Our institution and its funders have committed so much into the program but we have many other activities to take care of. The schools, the institution runs take a lot of the resources that can go to the farming activities. The state departments that can support this initiative hardly respond to our proposals.*

The farm manager expressed a similar sentiment that:

*We are doing so much and can do far better through the holistic management approach in addressing the challenges of poverty, unemployment, inequality and environmental degradation but we do not get the recognition from government and the private sector who need to come on board.*

Thus, financial constraints have prevented the institution from fencing off and demarcate some sections of the land and buying enough animals to the carrying capacity of the land. The organization has been stocking its heifers and only slaughters some of the bulls thereby reducing the rate at which it can fully use the available land.

## Conclusion and recommendations

The holistic management approach is one of the ways that the government can use to address the unacceptably high levels of poverty and ensure food security in the rural areas, while at the same time taking care of the environment. The Tiger Kloof case shows that the holistic management approach is viable economically and can also be used to address environmental and social challenges in rural communities, most especially in addressing land reform challenges. The organization, however, faces constraints which if overcome, can benefit the neighboring farming communities in addressing some of its socio-economic challenges.

Firstly, it is recommended that The Department of Agriculture, Forestry and Fisheries development partners and the private sector support this initiative as the training can ensure food security and reduce the high poverty levels in the rural communities while addressing the environmental challenges con-

fronting the world today. In addition, the state, private sector and NGOs should subsidize or provide free Nguni cattle for emerging farmers and poor households who want to use the holistic management approach.

It is also recommended that the National Department of Agriculture should use this model in other provinces to train households, emerging farmers and the

youth to ensure food security. Alternatively, the school can be supported to extend its training for emerging farmers in rearing Nguni cattle beyond its immediate environ to include other provinces as well.

It will also be very useful if the government can support emerging farmers who are interested in using the holistic management approach in the rearing of Nguni cattle but cannot afford the infrastructure.

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