The Design, Implementation and Effects of the Nguni Project in the Eastern Cape Province of South Africa

By

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DECLARATION

I, Lovett Mophethe Somoro hereby declare that the work contained in this thesis is entirely my own work with exception of such quotations or references which have been attributed to their authors or sources and that all maps, graphs and outlays are made by me save where I have acknowledged that another is the author.

Lovett Mophethe Somoro
August, 2009

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ABSTRACT

The main objective of the study was to examine the design, implementation and effects of the Nguni project in the Eastern Cape Province of South Africa. This was seen as an important exercise considering that most agricultural development initiatives in rural communities fail or their success rate has been low. Agricultural development initiatives should provide economic and social benefits, failing which; most well-intentioned initiatives result in adverse effects to the society. Therefore, an examination of the design, implementation and effects of the Nguni project would go a long way in helping to highlight and rectify pit-falls in similar future intended projects.

A sample survey was conducted in Amatole, OR Tambo, Chris Hani, and Alfred Nzo District Municipalities, using structured questionnaires, supplemented by observation. The questionnaire covered demographic, management and personal aspects in order to elicit respondents' values, aspirations, experiences and perceived constraints. The data were analysed using descriptive and quantitative statistics. The findings indicate that the project was well designed and implemented, though its performance suffered from some problems that can be corrected through proper involvement of all the institutions involved.

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CHAPTER 1
Introduction

South African agriculture is characterized by a number of farming regions according to climate, natural vegetation, soil type and farming practices. South African farming systems range from intensive crop production and mixed farming in winter rainfall areas, to cattle farming in the bushveld, and predominantly sheep farming in the more arid regions (Palmer and Ainslie, 2006). Livestock is the largest agricultural sector in South African agriculture; with a population of an estimated 13.8 million cattle, of which 2.6 million are raised in the Eastern Cape Province. Of that, over 1.7 million are owned by black farmers in the communal areas. This is not surprising because only 38% of the land area of the Eastern Cape Province receives an average annual rainfall of more 600 mm. The remaining 62% is drier with insufficient water to fully support crop production. Hence, climatic conditions in the Eastern Cape Province are more suitable for livestock production (Van Averbeke *et al*., 2006).

The livestock sector plays an important role in South African agricultural production and to the national economy. National Department of Agriculture (NDA) (2007) indicated that livestock industry accounts for more than 40% of the total value of agricultural output, which is not surprising as 80% of the agricultural land in South Africa is not suitable for crop production. Livestock production is practiced throughout the whole country with species and their numbers varying due to climatic conditions, biomes, proximity of input requirements, production potential, population concentration and markets (NDA, 2007).

1.1 Livestock farming in South Africa

South African agriculture can be categorized into two main categories: commercial and communal agriculture. The commercial farming sector is highly developed, capital-intensive, and exports some of its produce. The combined livestock sector contributes 75% of the national agricultural output (Palmer and Ainslie, 2006).

Communal agriculture differs from commercial agriculture through its production systems, objectives and property rights. In this sector, only the cropping areas are normally allocated to individual households, while the grazing areas are shared by the

community members. The communal sector has a higher human population per unit of area than the commercial sector, and has had fewer state interventions, such as provision of adequate dipping tanks (Palmer and Ainslie, 2006).

Livestock fulfils a number of important roles or functions in the lives of rural communities in developing areas. Nkosi and Kirsten (1993, p. 230) categorized the roles played by livestock in the lives of the rural communities as social, cultural and economic. For example, livestock provides food, employment, income, draught power, organic fertilizer, a means of transport, and it serves as a store of wealth.

There are a number of problems affecting cattle farming in the communal areas of South Africa. Nkosi and Kirsten (1993, p. 231) and Makhura and Wasike (2003, p. 129) noted that the productivity of cattle kept under traditional management conditions is negatively affected by harsh environmental conditions, seasonal labour constraints, diseases, and nutritional deficiencies. There is also a problem of poor reproductive performance as a result of one or more physiological, environmental or genetic factors, and inadequate management practices. Typical consequences are:

- Overstocking which leads to pasture and soil degradation due to overgrazing.
- High calf mortality.
- Low weaning percentage.

Communal livestock farming does not encourage individual farmers to purchase improved sires because such sires would not service only their own cows, but would also service other people's cows. There is a high probability that their own cows would be serviced by inferior bulls, resulting in inferior offspring (Steyn, 1988). The same author indicated that the disadvantage of communal livestock farming does not only outweigh the possible advantages of the adoption of improved technologies, such as modern co-operative farming, but also hampers the initiative and incentive of the local farmer, especially in the adoption of proper pasture and soil conservation measures, and the motivation to seek and apply better ideas and advice. There is also a lack of proper support structures such as dipping tanks, and a shortage of trained and motivated extension officers.

1.2. The Nguni project: Planning and structure

Against this background, researchers and development specialists have come up with several initiatives to improve livestock, for example, beef cattle improvement initiatives in Polokwane in the Limpopo Province, and in Pretoria in Gauteng Province. However, such livestock improvement projects have often failed or their success rate has been low, due to factors such as the following (Shollenberger, 2007):

- Lack of appropriate selection criteria for breeding stock for productivity.
- Inadequate management practices, together with poor nutrition, and lack of proper disease control measures.
- Lack of regular programmes for training, and continued education for extension workers.

The Nguni project was conceived in an attempt to uplift the livelihoods of livestock-holders in communal areas. It is a co-operative project between the University of Fort Hare (UFH), Industrial Development Corporation (IDC), Eastern Cape Department of Agriculture (ECDA) and Development Bank of Southern Africa (DBSA), for cattle improvement. The project is meant to re-introduce the indigenous Nguni breed of cattle into the communal farming areas of the Eastern Cape Province of South Africa (Raats, 2004).

The Nguni breed was chosen for this livestock improvement programme because of the breed's perceived suitability for the farming conditions in the Eastern Cape Province. Nguni cattle are a sub-type of the African Sanga cattle with the characteristics of Bos Indicus and Bos Taurus, though physiologically are different from both types. They have been shaped by natural selection in the African environment which is characterised by harsh; disease-ridden tracts, and drought-prone areas for thousands of years. These cattle are found in areas where the descendants of the original Nguni tribes settled, such as Swaziland, Kwazulu and the Eastern Cape Province (Embryo Plus, 2002). Nguni cattle have the following genetic value and inherent capabilities (Raats, 2004 p. 2):

- High meat quality.
- Placid temperament.
- Tolerant to excessive heat and humidity.

- Longevity and adaptability.
- Ease of calving.
- Early sexual maturity under harsh conditions.
- High fertility under harsh conditions.
- Good foraging ability.
- Resistance to ticks and tick-borne diseases.

The Nguni project aimed to give ten heifers and two bulls to each of the recipient communities, in order to establish a nucleus of registered Nguni herds that would provide sufficient bulls to upgrade the cattle in these communities. These communities would then be required to contribute, in turn, within three to five years, ten heifers and two bulls from the offspring. These would then be given to another community in order to make the project self-sustainable and expanding (Raats, 2004).

The following description of the objectives, structure and implementation of the Nguni project is an extract from Raats (2004, pp. 3 *et. seq.*).

> Objectives of the project
>
> 1. To re-introduce the indigenous Nguni cattle breed into the communal areas of the Eastern Cape Province of South Africa. This objective will be achieved through the large-scale implementation of the "Fort Hare Model", with the aim of upgrading 10% of the communally owned cattle in the Eastern Cape Province to Nguni status. The cost effectiveness of this model, which is at least five times more cost effective than the conventional livestock improvement or bull schemes, leads us to the second objective of the project, which is:
> 2. To uplift the living standard of the rural communities through the creation of an organic Nguni beef market.
>
> Structure of the project
>
> The structure of the Nguni project should be viewed in the light of six phases, which are:
>
> Phase 1. Development of a sustainable model for the re-introduction of the indigenous Nguni cattle breed to communal farming areas of the Eastern Cape (Completed 1997).
>
> Phase 2. Evaluation of the model, which is, "Fort Hare Nguni model" (Completed 2002).

Phase 3. (Research). It involved conducting four research projects which are:

- Production potential/adaptability of Nguni cattle in communities (Completed 2001).
- Evaluation of the potential of ecologically produced meat for global markets.
- Evaluation of the potential of Nguni skins and hides in global markets. (Completed 2003)
- Market research: "Organic niche market"

Phase 4. Evaluation of the impact of fodder bank on the critical dry period; Evaluation of the potential of Nguni skins and hides in global markets. (Completed 2003)

Phase 5. (Implementation). Upgrading of 75 000 existing cattle in communal areas of the Eastern Cape to Nguni status (current application).

Phase 6 is sub-divided into three:

- Organisation of local Nguni auctions for selling and buying breeding stock. (started 2003)
- Creation of a support system for farmers i.e. training and seconding of Extension Officers to villages.
- Creation of a niche market for quality Nguni meat, for example, local tourist hotels and overseas markets.

From this description it is clear that the Nguni project is wide-ranging in terms of its objectives as well as its geographical reach and the anticipated impact in many rural communities.

1.3. Roll-out of the Nguni project

Information provided in this section was compiled from Raats (2004), project records held in the Nguni Project Office at the University of Fort Hare, and information collected through interviews with. Nguni Project staff members.

The Nguni project was initiated in the early 1990s and during the mid 1990s its implementation started in two communities in the Amatole District Municipality, namely Melani and Dyamala, through funding provided by the Norwegian government (Raats, 2004).

For each individual project there was a process of preparation. It consisted of community mobilisation through communication and awareness programmes which were conducted through meetings with extension officers, the regional livestock

coordinators, the stakeholders that are involved in regional economic development, and the community.

Community mobilisation was followed by community selection which was conducted by regional livestock coordinators and extension officers.

Lastly community empowerment was done on the basis that that Nguni project is a livestock improvement initiative which requires a holistic developmental approach and is likely to encounter some problems that characterise communal grazing areas. Therefore, the first empowered team was composed in the form of a board of trustees which is chaired by a farmer; the focus was on issues relating to planning, implementation and evaluation of the project. The second team was the provincial livestock improvement forum, also chaired by a farmer in order to create smooth running of the project politically and economically. The last team was the regional level selection, planning, implementation and evaluation team which is chaired by livestock coordinators.

The whole process of preparation was achieved through employment of Rapid Rural Appraisal and Participatory Rural Appraisal on community leadership and community with leadership.

Preparation also included community profiling which was conducted by among others, community members in order to collect socio-economic data, information on environmental resources and potential of the communities which will then be used for further community planning and development initiatives.

The preparation phase was concluded by the signing of a formal contract. In order to accommodate of institutional and constitutional arrangements while taking into account local interests, a community-based legal entity in the form of a local Trust was registered, since it allowed all community leaders such as political, traditional, religious and business leaders to be formally part of the local initiative.

Following introduction of the two pilot projects in Amatole Local District Municipality (Melani and Dyamala villages) in the mid-1990s, actual roll-out of the project started in 2004 in 15 communities around the six Local District Municipalities Amatole, Chris Hani, OR Tambo, Alfred Nzo, Cacadu, and Khahlamba. From 2005 to

2006 the project had moved to an additional 25 sites that included 14 communities, three schools and eight farms. In total it was rolled out to 40 sites within a three-year period. (While this research project was underway another ten individual projects were started.)

The selection of communities for implementation was based on the perceived "readiness" of the candidate communities, as determined during the community profiling and other preparatory stages described above; there was no specific attempt to achieve any particular geographical or local-authority distribution.

For each site where the Nguni project was introduced a total of 12 registered animals were given, ten cows and two bulls. Over the three-year period from 2004 to 2006 a total of 480 animals were given to 40 individual projects (sites) in the Eastern Cape Province. These included 26 community project, 11 farms and three schools. This roll-out is set out in Table 1.1 below.

Table 1.1 List of communities given the Nguni cattle

Community	District Municipality	No. of animals	Year given
1.Winterberg	Amatole	12	2004
2.Phandulwazi	Amatole	12	2004
3.Kwezana	Amatole	12	2004
4.Msobomvu	Amatole	12	2004
5.Jojozi	Amatole	12	2004
6.Tyutyuza	Amatole	12	2004
7.Upper Gqumashe	Amatole	12	2004
8.Lower Gqumashe	Amatole	12	2004
9.Ngqele	Amatole	12	2004
10.Ncera	Amatole	12	2004
11.Kamastone	Chris Hani	12	2004
12.ZuluKama	Chris Hani	12	2004
13.Gxwedera	Amatole	12	2004
14Mankazana	Amatole	12	2004
15.Ntselamanzi	Amatole	12	2004
16.Emfundisweni	OR Tambo	12	2004
17.Hexriverfarm	Chris Hani	12	2005
18.Ouplass	Chris Hani	12	2005
19.Bell	Amatole	12	2005
20.Bolotwa	Chris Hani	12	2005
21.Wingelspruit	Khahlamba	12	2005
22.Mzamowethu	Amatole	12	2005
23.Masiphathisane	Amatole	12	2005
24.Nompumelelo	Chris Hani	12	2005
25.Upper Mnxe	Chris Hani	12	2005
26.Mahobe	Alfred Nzo	12	2005
27.Indwe	OR Tambo	12	2005
28.Mampondomise	Alfred Nzo	12	2005
29.Luckily Farm	Chris Hani	12	2006
30.Platform CPA	Amatole	12	2006
31.Lesseyton	Chris Hani	12	2006
32.Upper Hazelden	Chris Hani	12	2006
33.Mthimde	OR Tambo	12	2006
34.Saphukanduku	Alfred Nzo	12	2006
35.Didikana	Amatole	12	2006
36.Masele	Amatole	12	2006
37.Dyam-Dyam	Amatole	12	2006
38.Blikana	Khahlamba	12	2006
39.Olympia School	Western Cape	12	2006
40.Killidare	Khahlamba	12	2006

Source: Nguni Project Office, University of Fort Hare

1.4. Research Objective

The main objective of this research project is to provide a critical description of the design, implementation and effects of the Nguni project in the Eastern Cape Province of South Africa. This objective is pursued by formulating three research questions, each relating to a particular aspect of the overall objective.

1.5. Research questions

The research questions represent a breakdown of the research objective into manageable parts, in such a way that collectively, the answers to the research questions provide the information required to achieve the research objective. The research questions are as follows:

1. To what extent were the objectives and structure of the Nguni project tailored in relation to the needs and aspirations of the rural communities?
2. To what extent is the way the Nguni project is being implemented, in agreement with participants' expectations?
3. What are the observable effects of the Nguni project?

***Research question 1**: To what extent were the objectives and the structure of the Nguni project tailored in relation to the needs and aspirations of the rural communities?*

Here we seek first to understand the needs and aspirations of the rural communities, which to some extent are influenced by their culture, traditions, norms, values and attitudes; and second, to determine whether the objectives and the structure of the project correlate with the communities' needs and aspirations. Therefore, the researcher had to know the Nguni project objectives and its structure. The information concerning the projects' objectives and its structure was obtained directly from the project designers and the planners through a request for clarity on the two issues concerned. Information concerning the needs and aspirations of the rural communities was obtained through direct questioning of the communities in terms of the questionnaire, on aspects such as what they would like to achieve, and how they thought they would achieve them; as well as changes they would like to see in their lives in future.

***Research question 2**: To what extent is the way the Nguni project is being implemented in agreement with participants' expectations?*

Here the researcher seeks to understand the implementation issues behind the Nguni project in order to provide clear description of the project; therefore the projects' planners and the implementers, as well as the communities, were asked to answer specific questions relating to implementation of the project.

***Research question 3**: What are the observable effects of the Nguni project?*

Livestock development projects can have positive or negative effects on the lives of the poor rural people. The project has the potential to change the communities' outlook towards agricultural production, positively or negatively, on aspects such as their managerial and marketing practices. Since the project is in its initial stage, the main focus will be on managerial aspects rather than marketing issues. Therefore, respondents would be required to shed light on their management practices, and on changes they perceive to have been brought about by the project, through answering the questions on the questionnaire.

1.6. Delimitations

The study will concentrate on individual projects that were implemented between 2004 and 2006, and will have been in operation for at least two years at the time of this study.

In terms of the planning of the Nguni Project, sales of animals and their products is expected to occur only after five years from actual handing over of the animals to the communities. Marketing is therefore excluded from this study, as the fife-year mark has not been reached by any of the individual projects.

1.7. The importance of the study

The Nguni project is an initiative to improve the livelihoods of the poor people in communal areas, and at the same time re-introduce the Nguni indigenous cattle breed, which in past years has been replaced by exotic breeds, some of which are not adapted to the environment, and not as productive as the Nguni breed. An understanding of

aspects within the design and implementation of livestock development projects in the rural communities is of interest to the rural population, to livestock development project planners, as well as to agricultural policy makers.

This study is undertaken in the belief that the description and assessment of the design, implementation and effects of the Nguni project would be useful to all the parties involved in livestock production in these areas.

1.8. Outline of the study

Chapter two gives a broad description of the study area, including issues such as topography, climate, vegetation, soils, hydrology and water resources as well as natural resource management practices. Communal livestock farming depends to a large extent on natural resources, therefore it is important to evaluate whether the existing resources can support the introduction of projects such as the Nguni project. Chapter three examines the role of livestock in communal areas, as livestock farming plays several different roles in the rural communities. It is important to find out whether introduced livestock development projects meet the expectations of the poor rural people. This will help to determine the relevance of the Nguni project for the rural communities. Chapter four presents a review of literature on factors that have a bearing on the successes and failures in rural livestock development projects including the project cycle. Chapter five describes the methods employed in the collection and analysis of empirical data. Chapter six focuses on the analysis and interpretation of the collected data giving emphasis to those aspects that are related to the research problem and the research questions. Chapter seven interprets findings emanating from chapter six. Conclusions are reached through testing the findings of the study against the research questions of the study. Recommendations for further research are also outlined in this chapter.

1.9. Definition of terminology and abbreviations used in the study

- IDC: Industrial Development Corporation
- ECDA: Eastern Cape Department of Agriculture
- DBSA: Development Bank of Southern Africa
- ARC: Agricultural Research Council

- Non-participants: Respondents who did not participate in the Nguni project
- Participants: Respondents who participated in the Nguni project
- Commercial farming: Farming with the aim of making profit
- Developing farming: Farming with many objectives, such as profit making if possible, social objectives and cultural objectives
- Communal agriculture: Agriculture practised by rural communities.

CHAPTER 2
Description of the study area

This chapter presents a description of the study area. Factors such as topography, climate, vegetation, soils, hydrology and water resources, as well as natural resource management, are broadly reviewed, as they have a bearing on livestock farming, and thus influence the performance of the Nguni livestock development initiative.

The area covered by this study consists of four Local District Municipalities of the Province of the Eastern Cape, namely Amatole, Chris Hani, OR Tambo and Alfred Nzo. Demographics of the study area are also covered.

Most of the information presented in this chapter is based on Lent *et al* (2000), who give a comprehensive description of the agricultural and demographic conditions in the Eastern Cape. In addition to this reference for the chapter as a whole, references are cited for specific information obtained from other sources.

2.1. Topography

The general topography of the Eastern Cape is steep. About a third of the province consists of mountain ranges with large differences in local relief (Van Averbeke *et al*., 2006). Plateaus with medium to large differences in local relief cover just over half of the area (53.3%). Only a small part consists of relatively level plains (11.0%) and river valleys (4.6%). The valleys are usually deeply incised, and the occurrence of level land of alluvial origin is generally limited and localized. Three altitude levels are found in the Eastern Cape and all three are separated by two mountain ranges. The first level is the coastal plateau, which has an altitude of 300 m to 500 m. The second level is the midland plateau with an altitude of about 1 000 m to 1 200 m. The last level is the highland plateau with an altitude of approximately 1 500 m. There is a third mountain range in the northern part of the Eastern Cape, namely the Drakensberg Mountains.

2.2. Climate

The Eastern Cape has a diverse climate in relation to both rainfall and temperature. The province is comprised of 85% arid, or semi-arid zones. Rainfall increases from west to east, and coastal areas are much wetter than the inland areas. Most of the

western half of the province receives less rainfall, about 400 mm, whereas the eastern part of the province is much wetter with a rainfall exceeding 1 000 mm towards the mountainous areas of Maclear and Mount Fletcher, as well as the coast of the former Transkei.

There are four rainfall regimes in the Eastern Cape. The first regime is the summer rainfall, which is experienced throughout the northern and inland parts of the province. The second rainfall regime is a bimodal rainfall with early and late summer maxima. It is experienced on the coastal areas of the former Transkei and most areas south of a line running roughly east to west at the latitude of Mthatha. The third regime is the year-round rainfall, which is experienced throughout the extreme west of the coast, with early and late summer maxima. The coast on the extreme west receives year-round rainfall. The last regime is the winter rainfall regime which occurs throughout the headlands of Cape Recife and Cape St Francis.

Topography is the main factor influencing rainfall at the local level. Orographic effects (lifting of air masses due to changes in the surface level of the earth) may cause differences of several hundred millimetres in the annual rainfall, even over short distances (Gledhill, 1981).

Occasionally, hail occurs in the Eastern Cape, which may cause major crop damage. Hail intensity varies throughout the province relative to eastern and western areas. In the southwest of the province hail may occur less than one day per year, whereas in the northeast, hail may fall more than eight days per year.

The Eastern Cape has high irradiation most of the year due to its latitude which is between 30°S and 34°S. Differences in the degree of cloud cover result in differences in potential evapotranspiration (PET). The areas of lowest PET coincide with the areas of highest rainfall, and vice-versa. PET of about 1 250 mm per annum is experienced by high rainfall areas along the former Transkei coast.

The most important temperature-related agro-ecological factor at the regional level is probably the duration of the frost period. The frost duration increases with increasing altitude, and the period increases from south to north of the province. The north eastern mountains may experience frost duration of up to 120 days, whereas the eastern coastal strip is frost-free. Frost is absent, or occurs occasionally in the coastal

districts during the colder months of June, July, and August. The province experiences snow in winter in certain areas such as north of Cradock. The hottest months of the year are usually December, January, and February, when temperatures of 42.5^0C and evaporation as high as 50% are not unusual. Certain areas of the province experience fairly humid atmospheric conditions because of the prevailing winds and the sea mists (Gledhill, 1981).

2.3. Vegetation

There are about seven biomes in the Eastern Cape. The first is Grassland which covers 39.8% of the province. The second is the Nama Karoo which covers 25.4% of the province, followed by Thicket which covers 16.4%. The fourth biome is Savanna which covers 10.2%. Fynbos biome covers 6.0%. The sixth biome is Forest which covers 2.2%, and the last is Succulent Karoo which covers less than 0.1%. There is a varying degree of vegetation conservation throughout all the biomes. The best conserved is Fynbos with 67.1% of its total area conserved, followed by the Thicket with 23.7% of its total area conserved. Succulent Karoo is third with 17.4% of its total area conserved, and finally Forest with 15.8% of its total area conserved.

The Eastern Cape has diverse and transitional vegetation. The province has 20 veld types out of the 70 identified in South Africa. The province has the highest number of vegetation types in South Africa. The Thicket biome is found mainly in the larger river valleys. The Grassland biome is found mostly in the eastern half of the Eastern Cape and is comprised of sour and sweet veld. The western half of the province is dominated by Nama Karoo biome which is mainly utilized by sheep and goats. In the southwest of the province, there is a small area of Succulent Karoo which covers roughly 23 km^2. There are two types of Savanna biome in the province. The first is the sub-humid type which is found in the southeast of the province, and the second is the semi-arid type which is found in the southern-central part of the province. Most of the Fynbos biome is found in the southwest part of the province. Lastly, the Forest biome occurs in scattered patches, both along the coast and inland.

2.4. Soils

The most important factor for plant growth in the Eastern Cape is the soil water availability. The Eastern Cape has two main soil moisture regimes which are aridic and ustic (moisture that is limited but is present at a time when conditions are suitable

for plant growth). In the northwest of the province, soils are poorly developed and calcareous because of a lack of leaching, due to the low mean annual rainfall (less than 400 mm per annum) In the central part of the province, duplex soils are common due to the fact that a mean annual rainfall of between 400 mm to 600 mm results in a neutral reaction in the soil, though lime may still be present in the subsoil. Along the coast, and in the east of the province, soils have surface horizons that become acidic because of the mean annual rainfall in excess of 600 mm.

The agricultural potential of the Eastern Cape soils is limited by soil alkalinity in the western part of the province and acidity in the eastern part. Low infiltration rates, phosphorous deficiency, soil compaction and shallow rooting depth are other causes of the low crop potential.

Some soils erode more readily than others, even when rainfall, slope, vegetation cover and management are the same (Kilmer 1982).

2.5. Hydrology and water resources

A considerable part of the Eastern Cape lies within the Orange River basin, and drains inland, whereas the coastal areas are characterized by a large number of small coastal river systems, with occasional larger river systems penetrating into the surrounding area, due to the relatively narrow coastal plain and the mountain ranges. These systems drain towards the southeast, into the Indian Ocean. The province has no natural freshwater lakes of significant size, although many estuaries have become enclosed, forming lagoons.

The slope of the surface area and the intensity of rainfall contribute greatly to the amount of surface run-off in the province. Surface run-off varies from less than 3% of the rainfall in the northwest to more than 12% in the southeast, and in the Winterberg Mountains it can be as high as 22%. The variability of the surface run-off increases with decreasing rainfall (Kilmer, 1982).

2.6. Natural resource management

Climate, topography and geological factors limit the potential of crop production in the Eastern Cape, therefore the use of natural vegetation is dominated by animal production.

Cocks and Grundy (2001) indicated that for environmental sustainability, most developing countries have adopted community-based natural resource management initiatives in an attempt to address the problem of environment degradation. The same author went further by pointing out that community-based natural resource management has come up as a result of government failure to achieve such sustainability. South Africa has drafted policies that aim to achieve these outcomes. These strongly emphasize the importance of local people participation in such initiatives in both communal areas and state-owned land.

The Eastern Cape Province covers an area of about 17 million hectares and it has three broad natural resource utilization systems. Livestock is the dominant natural resource user. Secondly are crops, dominated by horticultural crops as against field crops, and thirdly is the mixed farming. Campbell and Shackleton (2001) pointed out that the local population generally have a negative attitude towards district-level natural resource management. Therefore, if more authority could be given to village organizations, including the traditional leadership, the more likely they are to succeed. Cocks and Grundy (2001) maintain that in the Eastern Cape, there are problems at grassroots level in relation to the management of natural resources, due to the past political upheaval. This situation is being compounded by the current ineffectiveness of the state to implement adopted policies.

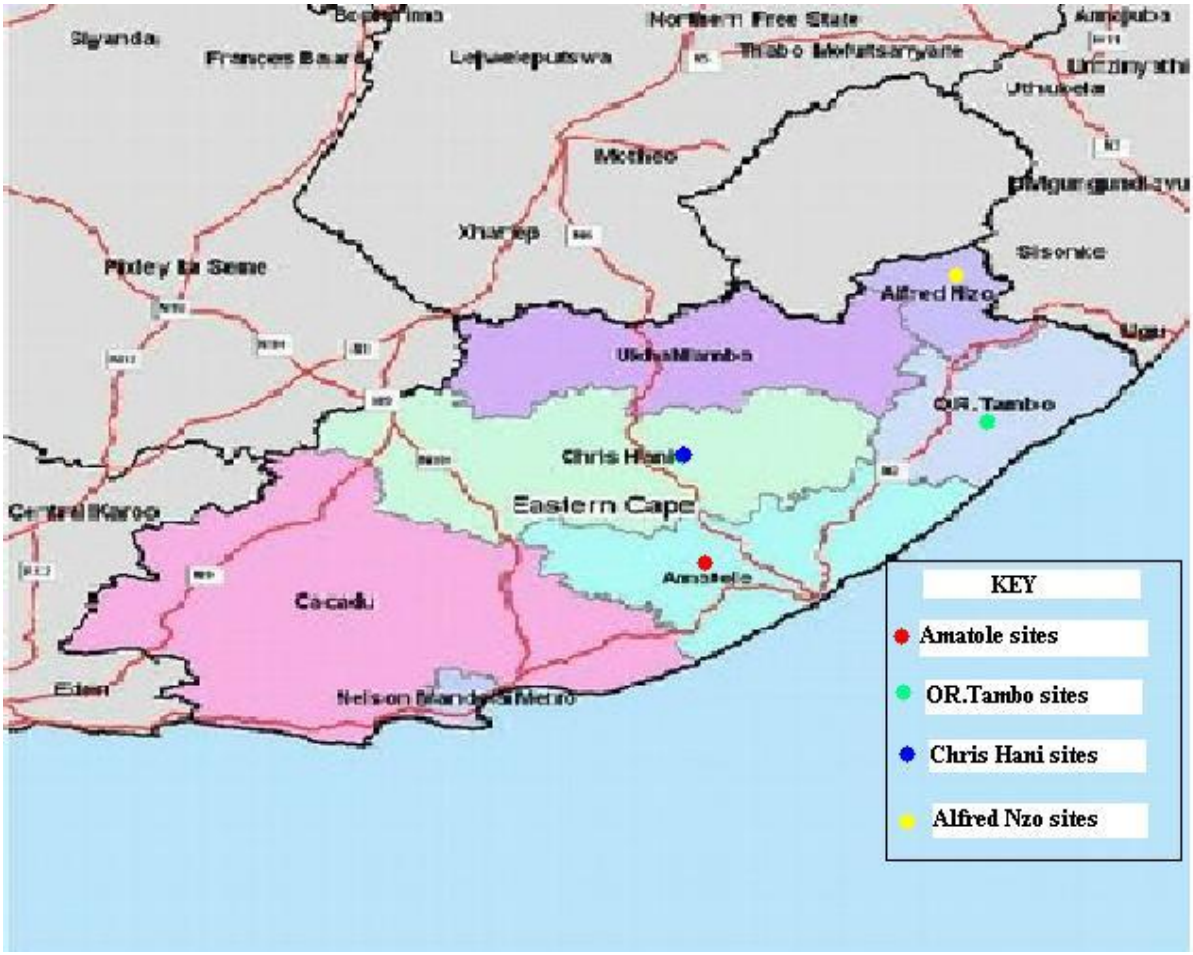

Figure 2.1: Map of the study area.
Source: www.id.org.za/siteworkspace/provincial-maps/

2.7. Demographics

There are four broad categories of land tenure in South Africa. Approximately 70% of the country is commercial farmland under freehold tenure, 14% is allocated to communal areas with leasehold tenure, 10% is formally conserved, and the remaining 6% is used for mining, urban and industrial development. South Africa's national commercial cattle herd is estimated at 13.8 million, including various exotic breeds of dairy and beef-cattle, as well as indigenous breeds such as the Afrikander and Nguni. Locally developed breeds include the Drakensberger and Bonsmara (Palmer and Ainslie, 2006).

There are two widely disparate types of production system. On freehold farms there are clear boundaries, exclusive rights for the individual properties, and commercial production objectives. This is in agreement with the view of Troskie *et al* (2000 p.594) in indicating that commercial farming system of South Africa share many of a developed economy whereas communal farming system portrays many features of a

developing economy. Land tenure issues considerably hamper the introduction and adoption of improved management practices in the communal areas, in which there are often unclear boundaries, generally open access rights to grazing areas, and the farmers are subsistence oriented (Reynolds, 2006). Though Rowntree *et al* (2004) are of the opinion that communal grazing systems are more influenced by rainfall than livestock numbers hence it is a dynamic ecosystem.

As noted by Palmer and Ainslie (2006) the commercial farming sector is well developed, capital-intensive and largely export oriented. Poultry is the largest contributor to commercial farming income, beef is another important contributor to commercial farming income and the major breeds are Brahman, Afrikander and Simmentaler. Sheep are largely concentrated in the drier west and also in the south east and are mostly the Dohne merino, bred mainly for wool production, and the Dorper, for meat production. Goats are more widely distributed and the main breeds are the Boergoat and the Angora. Grazing livestock are raised under extensive ranching conditions, relying on natural pasture, occasionally supplemented by protein/mineral licks. Ostriches are farmed in the southern parts of the country and use natural vegetation, supplemented by fodders and concentrates.

The commercial areas are divided into fenced ranches and then further subdivided into a number of paddocks, through which some form of rotational grazing is normally practised. Compared to the communal areas, stocking rates tend to be more conservative. Kille and Lyne (1993 p.103) pointed out that there is more degradation of grazing areas in the communal areas than in commercial farming areas, this is attributed to the fact that access to grazing is usually open.

NDA (1998) indicated that traditional livestock farming varies across South Africa. Cattle are mostly traded on the formal market in the north and west of the country. While cattle not actively traded in the southeast and east, small stock and their fibre are (NDA, 1998). They differ markedly from the freehold areas in their production systems, objectives, and property rights. Usually only the cropping areas are allocated to individual households, while the grazing areas tend to be shared by members of a community. The communal sector has a substantially higher human population per unit area than the commercial sector, and has suffered from lower levels of state intervention. Investments in infrastructure (access roads, fences, water provision,

electricity supply, and dipping facilities) have not kept up with the commercial rangeland. The production systems in the communal areas are based on extensive livestock-keeping and some cropping, the majority of households are subsistence-based, and farming is labour intensive with limited use of technology and external inputs. The outputs and objectives of livestock ownership are much more diverse than in commercial livestock production and include draught power, milk, dung, meat, cash income and capital storage as well as socio-cultural factors (Fraser, 2003).

2.8. Concluding remarks

Overall, those districts of the Eastern Cape Province that were chosen as the target area for the Nguni project (and hence the study area for this research project) are particularly suited to extensive livestock-keeping, and are settled by rural communities for whom livestock-keeping is an important activity. This is the result partly of environmental factors as described in this chapter (e.g. topography; climate; vegetation; water resources; natural resource management); and partly of historical socio-political factors. It appears, therefore, that the Nguni project may well be a suitable form of project in those districts.

Of course, in communally settled areas, livestock-keeping is not simply a "farming activity" – the reality is much more complex than that. For this reason, the following chapter will concentrate on the role of livestock and livestock-keeping in such communal areas.

CHAPTER 3

The role of livestock in the communal areas

This chapter reviews the different purposes served by livestock-keeping in communal societies. Emphasis is placed on aspects such as cultural, social, and the economic role of livestock because of their influence on the livestock production practices. The cropping areas are allocated to individual households, while the grazing areas are shared by members of a community. The communal sector has a higher human population per unit area than the commercial sector, and has suffered from lower levels of state intervention such as investments in infrastructure for example dipping facilities, water provision and fences. The production systems in the communal areas are based on livestock-keeping, with or without some cropping. The majority of households are subsistence-based and production is labour intensive, with limited use of modern technology and external inputs because the objectives of livestock ownership are different from the commercial sector (Palmer and Ainslie, 2006).

Bembridge (1982) noted that in communal areas livestock production is regarded as the largest agricultural resource, yet it makes a relatively small economic contribution to the household economy. This is attributed mainly to low levels of management and deteriorating grazing lands. But the question arises as to whether the communal livestock production system is aiming to maximize an economic output or to fulfil the cultural, social and economic roles of communal livestock production.

3.1. Cultural role of livestock

To understand the cultural role of livestock in the communal areas, the word "culture" has to be defined. There are several definitions of culture, but our working definition is taken from the Encyclopaedia Britannica (2006), which defines culture as "an integrated pattern of human knowledge, belief and behaviour that is both a result of, and integral to, the human capacity for learning and transmitting knowledge to succeeding generations". Thus, culture comprises language, ideas, beliefs, customs, taboos, codes, institutions, tools, techniques, works of art, rituals, ceremonies and symbols. Therefore, culture can be considered to reflect the way human beings interact with their environment; hence it is an integral part of the human race. Gandini

and Villa (2003) suggested the following two reasons for strong cultural role in livestock production:

- The cultural role is mostly associated with indigenous or local breeds of livestock because these can be considered cultural elements, or properties, in relation to their role as historical witnesses, as they often play an integral part in agricultural practice and in the social lives of the rural people.
- Livestock can be linked to cultural properties because they contribute to the preservation of ancient local traditions, and reflect a long history of mutual benefit with local populations.

Raats (2004) also argued that the Nguni breed is an indigenous breed in the Eastern Cape Province and plays an important role in the lives of the rural people; therefore; preserving it would be preserving the cultural heritage of the rural people. Gandini and Villa (2003) went further to propose that the cultural role of livestock should be considered in terms of the following parameters:

- Antiquity
- Agricultural systems
- Role in landscape
- Role in handicrafts
- Role in gastronomy
- Role in folklore
- Presence in forms of higher artistic expression.

3.1.1. Antiquity

Antiquity in the cultural aspect of livestock refers to a period during which the animal has been present in the traditional farming area. The longer this period, the greater the impact the animal has had on the lives of the rural population. In the case of rural populations of Southern Africa, the Agricultural Research Council (ARC) (1999) and Bester *et al* (2003) indicated that the Tswana cattle in Botswana, the Ovambo, and the Kavango, the Caprivi cattle in Namibia, and the Nguni cattle in South Africa and Swaziland are part of the Sanga group. These are thought to be descendants of *Bos taurus* animals that were domesticated in the north eastern part of Africa, (the present

day Ethiopia and Somalia) between 7000 and 8000 years ago, and which arrived in the southern part of Africa 300A.D. to 700 A.D. Hence, these cattle breeds should be considered as cultural properties.

3.1.2. Agricultural systems

The cultural value of livestock in the lives of the rural communities, as far as agricultural systems are concerned, is noted by Bembridge (1982) and the World Bank (2002) when they indicated that in some regions of the world, including Africa, extensive livestock-farming as one of the agricultural systems, may be the only viable means of existence. They indicated that lack of water and arable land suggests that a change to crop farming would not be a feasible alternative. Rural people adopt practices that reduce risks from diseases and natural disasters, such as drought, by keeping different species such as cattle, sheep and goats, which allow grazing resources to be used more efficiently than if only one species were kept. Rural people, as communal grazers, maintain their farming system by splitting their herds into smaller groups to more rationally use grazing resources and to reduce the risk of loss from theft. Traditionally, they have also kept certain areas as reserve grazing sites for drought seasons. Therefore, the native breeds such as the Nguni in Southern Africa have been historically linked to the agricultural systems, which include the farming techniques practised by the local communities, thus rendering them the local cultural properties (World Bank, 2002).

3.1.3. Landscape

The cultural role of livestock in landscape refers to the degree to which the production of animals has contributed to the configuration of the local landscape (Gandini and Villa, 2003). Blench (2005) noted that in terms of an area or landscape, the grasslands of the bigger part of Africa are not ideal for crop production, but have historically been utilised for extensive livestock production. This has led to the development of a number of breeds which are tolerant to harsh conditions (e.g., drought, disease, high temperatures, and other types of stresses prevalent in Africa). The same author went further to make an example of the Mongolian cattle which characterise the Mongolian landscape; these cattle are adapted to the cold temperatures of the region and can survive on natural pastures, outside, in winters where temperatures drop below -40 ^{o}C (Blench, 2005).

3.1.4. Handicrafts

The cultural role of livestock in handicrafts is noted by Nkosi and Kirsten (1993) and Kelly (1959). Both studies indicated that livestock provide raw materials for rural people in communal areas, especially their hides, which are turned into many different objects such as mats, shields, whips and harnesses. The cultural role of livestock in the form of handicrafts is a functional parameter, whether for decorative purposes or for practical application, such as in the case of shields which were used in times of tribal wars. Krige (1962) pointed out the importance of livestock products in the making of handicrafts by the North African nomadic tribes, particular the Taureg and the Fulbe tribes. There are noticeable similarities between the North African nomadic tribes and the Bantu tribes of Southern Africa, as far as handicraft making is concerned. Gardi (1969) noted that in the olden days, these tribes relied heavily on the skins of their animals for clothing and footwear. The nomadic North African tribes still carry most of their provisions in leather sacks, for example, millet, tea, sugar, water, and clothes. Knives are kept in beautifully decorated leather sheaths. The same author pointed out that leather is still central to the lifestyle of the nomads, and the nomadic people are very skilled with their leather. The nomads' craftsmen have known for ages what to use for tanning their leather, and which plants or animal galls should be added in order to preserve certain leather colours. They know several methods for dyeing the tanned leather in different colours, such as kano-yellow, red, and yellow. The energy and effort they put into their craft, results in the high value the nomadic camel riders attach to their leather-covered saddles. This is reflected by the high price the riders are prepared to pay for their saddles (Krige (1962).

3.1.5. Gastronomy

The role of livestock in gastronomy is evident in many parts of the world. In Italy, Gandini and Villa (2003) indicated that farming of the three Valdostana cattle breeds has contributed to the development of one of the most important components of the Aosta Valley culture, the 'fontina' cheese. The same authors went further to point out that various gastronomic practices were linked to this cheese, such as 'fondue', Valdostana soup and different 'polenta' recipes. Krige (1962) documented the gastronomic role of the cattle breeds in the Zulu societies. She indicated that in the Bantu culture, animals were slaughtered only on special occasions, even though these tribes liked their meat very much. Because of other roles that the livestock play in

their lives, they usually do not slaughter them at will. In the Bantu culture, when the animal is slaughtered, depending on the type of occasion for which the animal is slaughtered, certain parts of the animal will be consumed by selected people, and no one else may have them. For example, in Zulu culture, the part of an animal considered the best, the meat covering the ribs, is called *insonyama*, and the *insonyama* on the side which has the assegai (spear) wound - the side of honour - (*eyenxeba*), is eaten only by the district chief. The *insonyama* from the uninjured side (*eyendlela*) is eaten by the local chief. There are quite a number of striking similarities between the Bantu cultures and the north eastern African Masai people. Diop (1989) and Krige (1962) documented their heavy reliance on the milk of the cattle rather than their meat, and both the Bantu and the Masai consume the blood of the animals, though the Masai often draw the blood from the live animals whereas the Bantu kill them first. This clearly indicates the importance attached to the live animals by pastoralists and agro-pastoralists.

3.1.6. Folklore

The role of livestock in folklore is deeply embedded in many rural societies. Blench (2005) indicated that Zulus, Xhosas, Sothos, Tswanas and other cattle keeping people in Southern Africa, have historically emphasised the cultural importance of cattle in their livelihoods. For example, Zulus would consider pure white Nguni cattle as a royal herd, thus showing respect for their royalty. Zulus would chose particular types of animals for specific ceremonies, such as choosing black Nguni bulls for ancestral sacrifices. Krige (1962) pointed out that in the Bantu cultures, more especially the Zulu nation; there are two types of folktales which basically signify the importance of their livestock. The first type of folktales includes stories told for recreation, though there is often an element of education within the story, which is meant to educate the young children. The second type of folktales includes those based on historical fact. An example of a recreation folktale which is very popular among the Zulu people, according to Krige (1962), is a story of a boy who lived on an ox (*Ubengopha Kamadlela*). The story tells how the boy helped protect his village people from thieves, through the mystical powers of the ox, to the extent that he refused to abandon his life on the ox in order to get married. This folktale just illustrates the importance of the animal, to the extent that one might even choose to forfeit marriage in order to be with one's cattle.

3.1.7. Presence in the form of higher artistic expression

Presence in the form of higher artistic expression is derived from the extent to which the animals have been perceived by the local population as a typical component of the rural dimension of its farming locality, either in prose, poetry, or figurative arts (Gandini and Villa, 2003). Krige (1962) argued that in most traditional societies, group solidarity is usually maintained by song and dance. This is why the Bantu people, such as the Basotho, Xhosas, Zulus, Swati, and Tswana, regard music and dancing as an integral part of their lives. At most of their traditional ceremonies, such as circumcisions, weddings, preparation for tribal battles, and at important transition ceremonies that signify entry into a new group, they sing about many social issues, including their animals. Krige (1962) went further to illustrate the importance of livestock in the artistic expression of these rural people, by noting that even some of their musical instruments are made of livestock products. For example, some of their drums are made from cattle and goat skins.

3.2. Social role of livestock

For many centuries a symbiosis has existed between people in the communal areas and their livestock (Bester *et al.,* 2003). Concerning the role of cattle in traditional rural African society, it becomes rational to maximize the size of one's herd, regardless of meat quality and milk production, beyond the point of profit maximising herder. This view is supported by Tapson (1990) and Vink (1986) considering their realisation that ownership of cattle cannot be attributed to single factor such as customs or profit maximisation only. The argument is that the African perspective of quality in cattle is rather more aesthetic than economic, though livestock, especially cattle, still play an important part in the economy. Cattle are accumulated mainly for prestige and wealth reasons, and because cattle are the main medium of exchange in payment of the bride-price (*lobola*). The consumption of meat, milk, and hides is only a secondary by-product of livestock ownership. As cattle can be used, not only for marriage purposes, but for the entire network of matrimonial exchanges, and the whole kinship structure, much of the legal system revolved around them (Von Warmelo, 1931). Nowadays kinship structure and matrimonial exchanges are not identical to the olden days but it is common cause that cattle still fulfil an important part in the social lives of the rural people.

Krige (1962) and Sanders (1975) argued that livestock, especially cattle, are important to the traditional rural people, because they can act as a 'social glue' between family members and between different families, as well as between communities and institutions. A closer look at the Bantu traditional marriage attests to the notion that cattle can act as social glue. In a Zulu marriage, it is not merely a conversion for the girl and boy into adulthood; it is gradual bonding of the two families. The loss of a family member disturbs the balance between the two families, and this has to be compensated by giving something else of value in return to the family of the bride, hence the *lobola,* or gift of cattle from the boy's family to that of the girl. The cattle act as a symbol of unity between the two families (Krige, 1962). The giving away of a daughter in marriage was not a happy occasion, therefore, something had to be done to lessen the blow, so the other family brought a number of valuable possessions, consisting, among others, of cattle, to present to the family of the girl. Their intention was to strengthen ties, create loyalty, and win the friendship of the girl's family. It was considered an honour to pay *lobola* with many cattle, and therefore every man did his best to give as many cattle as he could (Krige, 1962).

Krige (1962) went further to show that cattle used to play an even more important role than just paying *lobola* for the bridegroom. It was a bridegroom's social responsibility to assist the father-in-law by giving him a beast even when a brother of his wife got married. Apart from marriage ceremonies, the son-in-law was bound by custom to help the father-in-law in other ways: Whenever the father-in-law was in need he could call upon his son-in-law to help him with cattle for other services, such as doctor's fees, which were payable in livestock. For such reasons, a son-in-law is called by Zulus *Umphini wekhuba* (the handle of a hoe). The hoe was considered the most important implement in Zulu society because it was used to cultivate the fields in order to get food from the soil. The son-in-law *mKhwenyana* is then like the hoe, a friend and a helper of his in-laws, most importantly through his cattle.

Gifts were the most common means used to create social stability within rural traditional people, (Sanders, 1975). A bride would not go empty-handed to her new home. She would take one or more cattle, according to the wealth of her father. These were a gift to the bridegroom's family. One of these cattle would be killed for the wedding feast, while another would represent the girl and her ancestors in the new

family and would not be killed (Krige, 1962; and Knight, 1979). Therefore, cattle were not used merely to create wealth for the bride's family, as pointed out by Shepherd and Paver (1947), and Bundy (1979) but rather as a harmonizing element within the community.

Sometimes, if the bride did not behave in an acceptable manner, and neglected things which she had to do at her husband's home, she would be forced to go back to her own father and get gifts to bring back to her husband's home to cleanse herself of the "dirt" that she was contaminated with due to her misbehaviour (Kelly, 1959). She would bring a goat that would be killed and eaten by her husband's family. But she would be told that she had wronged her people and she should not do that again. Therefore, the goat would have helped to reduce the friction she had caused between the two families.

Sanders (1975), goes further to note that livestock creates stability within rural society as tools used in the resolution of conflicts. He argued that in the Basotho society for example, most offences such as theft, and assault were punishable with a fine payable in cattle, some of which were handed to the aggrieved party and the rest given to the chief. The Basotho regarded their livestock, especially cattle, with a mixture of affection, pride, and respect. The small boys made clay models of them, and their fathers would lean against the stone kraals in the evening and chant praise-poems in honour of their cattle to signify their importance in their lives. However, should there be any pressing social issues that demanded the sacrifice of livestock in order to maintain social unity and peace, the livestock was always sacrificed. For example, Sanders (1975) indicated that in the olden days, livestock raiding by opposing clans was a common practice between the Bantu tribes. The weaker clans were always raided by the stronger clans who captured their livestock. Some clans would offer livestock to the stronger clans to secure immunity.

Livestock has always been used to maintain the livelihoods and wellbeing of the rural traditional societies. Within any rural population, it could be that some families did not always have enough food. Some families were poor, and that is where livestock played an important part in safeguarding their wellbeing by providing meat and enabling them to pay for necessary services. Sanders (1975) pointed out that the benefits from livestock can even extend to those who do not own livestock. He argued

that non-livestock owners are sometimes able to obtain milk, dung, draught power for cultivation of their fields, and transportation from livestock owners, free of charge or at reduced charges. A typical example can be found in cases where wealthy traditional chiefs were expected to hand over a sizeable part of their herds to their people, under the *mafisa* system (helping the needy) in Basotho societies. In the days of tribal wars, different clans would fight each other in order to enrich themselves and bolster their authority by raiding livestock; the victorious chief would retain ownership of the cattle, while his people were allowed to use them for their own needs (Sanders, 1975). Tapson (1991) supported the above mentioned point by indicating that in the Zulu society a person owing a large number of cattle would not be the only one benefiting, he would be expected to distribute benefits of his animals among those with either fewer or no cattle through the institution of *ukuziza*. The ability of livestock to provide manure used to enhance soil fertility, and so to utilize marginal lands contributes to the wellbeing of the rural communities by contributing towards eco-system balance (Botsime, 2006).

3.3. Economic role of livestock

Livestock are an essential, and at times overlooked, component of the livelihood strategies of the rural people. Livestock holdings are varied, and include goats, sheep, horses, poultry, pigs and cattle, but cattle are considered the most important (Bembridge, 1982).

Bundy (1979) indicated that the ownership of cattle interlocks with the livelihood of the Nguni tribes. Possession estimates were that cattle probably outnumbered the human population by at least two to one, and that this affected the tribal economy. Unfavourable weather conditions and the existing technological constraints resulted in the Nguni family as an economic unit having to rely to a greater extent on their livestock for security. But Schneider (1979) cited Barth (1973) as arguing that in pastoral communities the nature of pastoral capital (livestock) opens up options for management decisions that are lacking in agricultural systems (crop production systems), because some of those options are that savings and investment are compulsory. Savings are considered as the existing livestock, whereas investment is the offspring of the livestock. He went further to point out that in agricultural systems

land is essentially imperishable and cannot be consumed by an economic unit (the family).

So, the question arises whether the objectives of livestock-keepers are to maximize their capital only for economic gains, or to also serve other socio-cultural needs. It would be impractical to equate the savings and investments which are said to be compulsory in pastoral communities with the socio-cultural objectives of the rural livestock rearing communities in order to justify the growth or decline of a pastoral enterprise. Bembridge (1984) pointed out that in communal grazing areas livestock owners prefer maximising the number of their animals which usually leads to overgrazing because the marginal cost of additional animals is borne by the whole community rather than the individual who maximises his/her number of animals. Policy makers should consider the fact that grazing practices in the communal areas may account for low price elasticity of supply. Furthermore, the market structure should be adapted by communal cattle owners so that they react to the fact that additional numbers of cattle impose costs on all livestock owners in the community (Sartorius von Bach, Van Zyl and Vink, 1992). Similarly, Vink (1986) found that the communal grazing system served to lower the cost of keeping cattle in the communal areas.

Schneider (1979) citing Haaland (1977) and Bates and Lee (1977) argued that a low rate of consumption of livestock and a low marketing rate (Bundy, 1979) is not only due to the extent to which they are tied up in credit relations, but also to other forces in play because of the nature of communal livestock production, which includes socio-cultural values of livestock in pastoral and agro-pastoral farming systems. This is in agreement with Tapson (1990) in indicating that communal people prefer increasing herd size rather than productivity. But Vink (1986) pointed out that this view should not be used as the only basis for policy formulation; instead, an institutional analytical approach should be employed. Inclusion of socio-cultural issues encompasses aspects such as the managerial capabilities of the rural people. Profits from livestock production are influenced by managerial abilities because they determine grazing practices employed, and thus the quality of the veld and its production capacity. This is because communal areas are not adjusted according to variations in rainfall; hence grazing conditions in the communal areas are heavily

influenced by the amount of rainfall (Sartorius von Bach, Van Zyl and Vink, 1992). Schneider (1979) argued that in situations where livestock is acceptable as currency in exchange for food from those who specialize in crop production, the extent to which pastoralists will focus only on livestock production is determined by two factors, namely:

- Local environmental conditions.
- The rate at which the exchange can be done.

These two considerations are interlocked with the other socio-cultural values which the livestock-keepers attach to their livestock, such as the burial, marriage and other ceremonies (Krige, 1962).

Rural traditional communal faming is mostly associated with subsistence livelihood, but due to the fact that livestock is considered to have purchasing power with crop producers, livestock farming will automatically lead to partial and sometimes full departure from the subsistence system to financial use and capitalist manipulations (Schneider, 1979). This argument is supported by Fraser (1991) and Steyn and Tapson (1992) as cited by Nkosi and Kirsten (1993), the reason being that the livestock farmers are starting to be commercially minded, though, at varying degrees. This is why, within the rural communities, some other functional uses of livestock rather than commercial purposes are still held in such high esteem, for example, animal draught power. The Development Bank of Southern Africa (DBSA) (1995) indicated that in South Africa, animal draught power can be seen to reduce the physical work endured by traditional rural people, and it increases the pace of operations for both men and women in tillage and transportation, when compared to manual options, such as hand-hoeing or head-loading.

It is not surprising that in rural traditional livestock farming, cattle are valued more than other types of livestock (Krige, 1962). Schneider, (1979) indicated that the reason for cattle being valued higher than other types of livestock is because cattle are considered as strong and hard currency. Thus cattle portray the following characteristics:

- Act as a medium of exchange.
- Store of value.

- Unit of account or standard of value.
- A standard of deferred payment.
- Are highly liquid.

All characteristics need not coincide. Schneider (1979) went further to make an example of characteristics of cattle which need not coincide, by stating that a commodity which acts as a medium of exchange may have little or no use as a store of value because its value rapidly changes. Therefore, for these currency (cattle) characteristics to concur, Schneider (1979) cited Einzig (1966) as saying a high degree of confidence must exist. Kelley (1959) indicated the high degree of confidence that is shown towards cattle by stating that cattle can be used for marriage purposes, draught power, and payment for other services such as doctors' fees.

An important aspect of livestock as currency is that livestock reproduce naturally and at low costs because of their ability to utilize even marginal lands. This creates an inflationary condition which is enhanced by the fact that since livestock are hard currency whose exchange value is tied to their storage value, they can be used as the foundation for long-term credit, and thus further supplements the supply of money since they are readily saleable. Currency (cattle) therefore provides the platform for an opportunity to obtain wealth, as is the case with the Nguni and other livestock-rearing people, such as the Masai (Schneider, 1979).

3.4. Concluding remarks

A qualitative comparison of the principles underlying the design and implementation of the Nguni project (as described in Chapter 1) with the overview of the role of livestock in the communal areas (this chapter) leads one to the broad impression that the Nguni project is indeed consistent with the values and customs of the intended beneficiaries as well as the prevailing livestock-keeping conditions in the rural areas of the Eastern Cape Province.

Realization of a growing shift towards market-oriented production, however, leads one to conclude that it is vital to have an adequate and supportive institutional set-up that will help to increase the production levels for commercial purposes. The fact that the initial plan for the Nguni project envisages marketing animals (for meat) and animal hides in the period three to five years into the project confirms that the project design acknowledges this partial shift towards commercialisation.

CHAPTER 4
Critical factors in rural livestock development projects

From the description of the Nguni project (and the extract from the funding proposal for its expansion) given in Chapter 1, it is evident that the project falls into the category of "agricultural development projects". Therefore, it is relevant to review some of the literature pertaining to such projects, including the critical factors which may determine successes and failures in such projects.

This chapter first highlights the typical *stages* of agricultural development projects, followed by a brief description of the different *elements* (facets) of such projects. The specific aim is two-fold:

- To establish a suitable analytical frame of reference to be used in this study; and
- To identify typical risk areas in such projects, to be considered in this study.

Implementation of the Nguni project also described with in this chapter, as is the research component of the Nguni project.

4.1. The project cycle

Benjamin (1985) and Van Rooyen *et al.* (2002) identified the following *stages* in a typical project cycle:

- Identification
- Preparation
- Appraisal
- Implementation
- Evaluation

These stages should be properly understood because most agricultural development projects in developing countries fail to realize their intended objectives, and the reasons cited for their failure are centred on improper consideration of the above stages. Some of the reasons for the failure of projects being flawed are: project design, faulty implementation, poor project analysis, and unexpected natural, economic or political situations (Van Rooyen *et al*., 2002).

Identification is the initial stage when fundable projects are identified. Diagnostic surveys and constraint analyses are carried out in order to prioritize problems that need to be tackled, and which lead to project development. Project identification is based on an overall assessment of the developmental goals. Participants in the identification stage include technical specialists, such as agronomists, economists, soil scientists, social scientists - such as sociologists and anthropologists, donors, NGOs, local leaders and government representatives (Benjamin, 1985; Van Rooyen *et al.*, 2002).

Preparation is usually the second stage of the project cycle. Depending on the complexity and the size of the project, this stage can be divided into two parts, the first part being a pre-feasibility study which focuses on subjective and qualitative analysis. During the pre-feasibility study, the main objectives of the project should be clearly defined, and better alternatives for reaching the intended objectives of the project must be considered, instead of poor alternatives. After completion of the pre-feasibility study, detailed planning and analysis is done by all the involved experts, in consultation with all the involved stakeholders of the project, in order for it to be technically and economically feasible. A proper preparation stage will result in the project being compatible with the existing production systems, resource-use patterns, and the socio-cultural beliefs of the target population (Van Rooyen *et al.*, 2002).

Appraisal. Van Rooyen *et al* (2002) described appraisal as the stage where feasibility, appropriateness and soundness of the project are re-examined in order to allow the implementation stage to be carried out, providing all the re-examined aspects are properly structured, or further preparation work should be carried out if some aspects are not properly structured. Management of processes and risks is the main focus.

Implementation. In the implementation stage, a realistic project management plan is vital, to develop such a plan, and a thorough analysis is recommended. It focuses on adapting inputs and development paths, as necessary, on a continuous basis, guided by the monitoring process. The following sub-divisions of the implementation stage should be properly considered (Van Rooyen *et al.*, 2002):

- *Investment period*: Major fixed investments are made, such as the purchasing of livestock and necessary equipment.

- *Development period*: The benefits of the project are expected to flow from this stage.
- *Monitoring*: In order to allow the project to run smoothly, agreed-on activities and any necessary adjustments should be regularly checked.
- *Maturity*: This depends on the nature and type of the project. Some projects can be considered mature at the age of 30 years or below. This is the stage when project impacts are more apparent.

Evaluation. Van Rooyen *et al* (2002) indicated that this is the stage where the success or failure of the project is measured; that is, to which extent the objectives of the project were achieved. It involves measurement of the following sets of parameters:

- Technical
- Institutional
- Social
- Economic
- Commercial
- Financial
- Environmental

Each of these sets of parameters represents a different *element* (or facet) of any given agricultural development project. These elements are briefly discussed in the following section.

4.2 Elements of livestock development projects

Clearly, the success or failure of any agricultural development project cannot be determined by estimating a single parameter of success. Instead, a project's successes and failures should be considered with respect to each of the elements (sets of parameters) listed above. The same applies to identification of factors that may influence such successes and failures.

4.2.1 Technical aspects

Van Rooyen *et al* (2002) pointed out that technical aspects cover a wide range of areas within the projects, such as the physical input and output of goods and services. They examine the technical relations in the project. These will vary from project to project. Technical experts such as veterinarians, agronomists, soil scientists,

economists and other specialists are involved in providing information on all major elements that lead to the identification of supplies, production, productivity, and technical input/output coefficients. Kirsten (2002) argued that increased technical efficiency, by choosing the proper means of agricultural services delivery, leads to better opportunities in cost-effectiveness. Therefore project analysts have to take into consideration that technical estimates and projections relate to realistic conditions of the specific locality. Studies conducted on livestock development projects in developing countries indicate that there has been very limited success. Major reasons for the failure rate include (Van Rooyen *et al*., 2002; Cernea, 1991; Benjamin, 1985):

- The absence of poverty-focus in the objectives of the project.
- The introduction of an inappropriate technology.
- Failure to deliver the services to the poor farmers.
- The capture of the project benefits by wealthier farmers.

Organisational weaknesses that are reflected by institutional frameworks which are on a collision course with pro-poor livestock farming result in the above-mentioned reasons for project failure (Pratt *et al*., 1997).

4.2.2. Institutional aspects

Appropriateness of the institutional setting (that is the rules of the game, or conduct that shapes the way people behave as individuals and as a society) is important for the success of the project (Van Rooyen, 2002). Customs and culture of the target population have to be understood and accounted for to avoid disruptions in the way to which farmers are accustomed. This can increase the possibility of the adoption and success of an intervention programme through their participation (Luykx, 1971; pp. 189-208). Some important aspects of the necessary institutional set-up for livestock development projects include land tenure, indigenous farmer organisations, national and local authority structures and their responsibilities. The organisational structure, inter-organisational linkages and efficient management of the organizations are crucial for success (Van Rooyen *et al*., 2002)

Bembridge (1984) and Mackenzie (1992) indicated that for rural development projects such as livestock development projects to succeed, their conceptualisation must be people-oriented. Therefore an understanding of the foundation upon which

sustainable rural livelihoods are built, is important. Dalal-Clayton (2003) indicated that sustainable rural livelihoods are derived from access to the following five types of capital:

- *Natural capital*: The natural resources such as land, water and wildlife.
- Social capital: The social resources upon which people depend for their livelihoods, such as relationships of trust, networks, membership of different groups within the society, and access to wider institutions of the society.
- *Human capital*: The indigenous and learned knowledge, skills and ability to work, and the necessary good health that would allow people to follow their different livelihoods.
- *Physical capital*: Production equipment and basic infrastructure that would allow people to go on with their different livelihoods, such as shelter, transport and communication.
- *Financial capital*: Financial resources which provide people with different livelihood alternatives such as savings, access to credit or pensions.

Livestock development projects are some of the implemented interventions in the rural societies in order to help the targeted population to accrue some of these forms of capital, to go on with their various livelihoods. However, studies have indicated that most rural livestock development projects fail to achieve their objectives. Some of the reasons for the failures can be found in the following typological scheme of institutions (World Bank, 1997).

National formal and informal institutions

There are rules that apply to every person which are embodied in national legislation, and such rules that influence access to every form of capital formation. For example, natural capital, such as water, and access to communal grazing areas is influenced by property rights, thus, communal livestock keepers depend to a larger extent on the rules that govern the use of such natural capital. The private-sector investment in the development or introduction of new technology which will be useful to the communal livestock farmers depends largely on the presence or absence of intellectual property rights, thus, new treatments and vaccines against livestock diseases cannot be easily introduced into the country that does not observe these intellectual property rights. Favourable national policies enable better utilisation of such technologies for the

betterment of the livestock farmers, whereas stringent policies hamper the consumption of such technologies (Dalal-Clayton *et al*., 2003).

Kirsten (2002) and Pratt *et al* (1997) indicated that national development policies also influence poor livestock-keepers, because sometimes governments prioritise growth from other sources rather than from the poor, which causes resources to be diverted away from the poor. Similarly, where national taxes and subsidies promote intensive commercial livestock-rearing, this discriminates against poor livestock-keepers who tend to practise less-intensive systems (Okidagbe *et al*., 1998).

The norms, values and culture of a given society are referred to as the informal institutions (World Bank, 2005). The national livestock sector of a given country is influenced by the norms and values of the citizens. For example, in societies that are dominated by certain religious groups, such as Muslims, pork consumption is not a priority, hence the pork industry will be the least developed. National informal institutions, such as the perceptions within the community towards gender issues, in some countries, influence the role women play in the livestock sector (World Bank, 2005).

Organisational level of formal and informal institutions

A number of organizations are involved in livestock development projects in communal areas, such as credit organizations for example banks. Such organizations have their own rules that govern the behaviour of their staff and the way they operate, hence such institutions will determine the impact they have on livestock development projects (Kirsten, 2002). Chambers (1974) pointed out that some formal institutions have a reward system which do not create incentives for working with poor rural livestock owners thus, hampering progress that could be made by poor rural livestock owners.

Saupe *et al* (1986 p. 209-214) argued that, although there is a need for formal institutions to develop livestock projects, there are some formal institutions that might be held responsible for hampering the progress that could otherwise be made by development projects, such as the common rule among credit organizations that only people with collateral (security) may borrow money. The same authors pointed out the positive side of formal organizational institutions by indicating that guidelines for

collective action could be provided by these institutions. For example, water-supply organizations that helps to prevent a 'free-rider' problem in communal areas by imposing a fee for the usage of animals' drinking water. Farmers' organizations and co-operatives allow or deny access to group benefits.

Informal institutions such as norms could have a positive or negative impact on the performance of livestock development projects introduced in the communal areas. For example, if poor communal livestock farmers realize that employees of credit-providing organisations attach insufficient value to their needs, the intended improvement project could easily fail because of a low level of farmers' participation (Dyson-Hudson, 1991, p. 248). Informal institutions could cause the necessary solutions to poor livestock farmers' problems to be overlooked in cases where they do not comply with good scientific practice, even if this scientific practice is in itself inappropriate for the poor livestock farmers. They may also include vested interests, for example, where government veterinarians supplement their incomes through providing private services. They therefore resist moves to liberalise the rules on who can deliver similar services, so as to maintain their monopoly, even though they are unable to provide services to everyone who needs them (World Bank, 2002).

Local level formal and informal institutions

For communal livestock farming formal rules may differ according to the locality for example, the restriction of movement of disease-infected animals from disease-infested areas to disease-free areas to prevent the spreading of such diseases and local-level informal institutions may shape farmers' livestock management practices, such as influencing access to local natural resources like communal grazing areas (Uphoff, 1991: p. 271-285).

Organizational and managerial shortcomings

Organisations produce the services and technology required to support the livelihoods of the poor livestock farmers, therefore they have a direct bearing on livestock development projects. The operational procedures within organisations, such as government Departments of Livestock, or savings and credit organisations such as banks, are determined by a number of factors. These include the formal and informal rules on how the organisations function. Management of such organisations plays a

critical role in ensuring that such rules are adhered to (Bembridge, 1982; Kirsten, 2002).

Some of the organizational problems that emerged in livestock projects were due to the remoteness of the projects, since most poor livestock farmers live in the remote rural communities, which make it difficult to provide the necessary services and inputs at reasonable costs, and on time. This is due to the fact that most developing countries lack proper infrastructure for transport and services, which may hamper implementation of livestock development projects (Mollett, 1984). The common problems of technical inefficiencies, such as inadequate or unavailable veterinary services and dipping tanks, point to managerial shortcomings in planning and implementing procedures by the concerned organisations and the project planners (Pratt *et al*., 1997). Lutz (1998) noted that acquiring qualified staff within the organisation is a major problem. Better co-ordination between government agencies, such as the Department of Livestock, Department of Finance, donor organisations such as the World Bank, and NGOs, could result in avoiding a number of organizational problems (Lutz, 1998). In many developing countries, poor livestock farmers' organisations lack the necessary capacity to achieve national policy changes which are compatible to the prevailing conditions in the livestock sector, mainly due to their weak political influence (Dalal-Clayton *et al*., 2003).

4.2.3. Social aspects

Social implications, such as resource and income distribution impacts, or potential impacts of livestock development projects, are important to the livelihoods of the poor livestock farmers. There are other aspects, which include the responsiveness of the livestock development projects to the national development objectives, employment opportunities, regional dimensions, losers and gainers in terms of social groups, gender issues, impact on social organizations, change in tenurial division of labour, quality of life improvement, that is water, health, education etc., (Van Rooyen *et al*., 2002; Kirsten, 2002).

Chambers (1993) pointed out that it is important for livestock development planners to consider characteristics of the poor rural livestock farmers when designing intervention programmes. These include: the poor rural people are hard to teach, they are typically unorganized, inarticulate, often sick, seasonally hungry, and quite

frequently dependent on local patrons. They are less educated, less likely to use government services, and less likely to visit outside their home areas than their better-off rural neighbours. They are often concentrated in regions remote from urban centres. Chambers (1993) indicated the importance of considering such characteristics, which leads to better planning in relation to the real, not perceived, needs of the farmers, as a prerequisite to the success of such programmes.

Chambers (1993) indicated that there are number of common features in livestock development projects in the developing countries, including: Projects for rural development are often captured by rural elites for their own advantage which can be compared to what Vink (1986) termed "tragedy of the chiefs"; credit goes to those who least needs it. Subsidised inputs, supplied through a co-operative, are monopolized by the leaders of the co-operatives, who are better-off. Therefore, the design of livestock development projects in poor rural communities needs to take account of these and other realities. The selection of poverty-focused projects should take account of these realities. Developments which generate livelihoods, create new demands for rural labour, and provide services to which all have effective access, or which enable poor people to support one another and to organize themselves in groups, will usually be preferred and supported by the community members (Chambers, 1993).

Most livestock development projects are heavily subsidized by the government, mostly from external resources, and their existence depends on continued official support (Lele, 1991). Chambers (1993) noted that this is true, not only of capital investments, but, in a number of cases, of the recurrent budgets too. Calculation of the social profitability of projects must include inputs and outputs at real prices for labour, capital, and foreign exchange, which reflect the true opportunity costs of these resources. The same author observed that the problem is that many benefits and costs are in the form of indirect social or environmental effects, whose positive or negative contribution to the national income cannot be directly assessed. But Curry and Weiss (2000) argued that the evaluation of project costs and benefits are dependent on the project inputs, which dictate that the main emphasis of a livestock development project should focus on the social wellbeing and economic wellbeing of the target population.

Most livestock development projects show various problems of acceptance by the local population, thus a wide range of attitudes are observed, from outright rejection of the whole project to very active involvement by the target population (Chambers, 1974; Narayan, 1995; Lutz, 1998). Pratt *et al* (1997) identified a number of problems concerning different land users in livestock projects, such as landownership between settlers and nomads. The same authors argue that experience from such projects indicates that land rights have to be settled before the project starts, or many efforts will fail. Therefore failure to take into account the genuine interest of all different groups of people within the community can result in unforeseen problems. Projects should be designed to fit the expectations and the resources of various groups of people, such as immigrants, local poor farmers, tenants, absentee farmers, and hired labour (Rawlings *et al*., 2004). Each group has a cohesive social background, and project organization could be adjusted to their specific needs. On the other hand, every time heterogeneous groups had to be included into one project, acceptance problems were often observed (World Bank, 2002). In addition, neglect of local leaders and of their role in tribal conflicts has accounted for a number of both expected and unexpected events which, to say the least, reduced the speed with which the project moved ahead (World Bank, 2002).

Saupe *et al* (1986, p. 209-214) and Clayton *et al* (2003) indicated that rural livelihoods within the community differ, therefore social acceptance becomes a problem in livestock development projects where livestock farmers are expected to be available for scheduled work in the fields at times which clash with their livestock-herding interests. Pratt *et al* (1997) went further by highlighting that, since livestock on rural communities depend on natural pastures, the livestock farmers usually reject proposals in which livestock has to be restricted to earmarked areas where pastures are not sufficient. This led Pratt *et al* (1997) to deduce that, in such situations, farmers give priority to their livestock interests, rather than the objectives of the projects. The same author pointed out that if project authorities try to achieve multiple objectives, such as connecting livestock disease control measures with tax revenue collection for the government; they often reduce their chances of success.

Social acceptance can become a problem in livestock development projects, particularly where rural people are expected to be available for scheduled work in their fields at times which apparently clashes with their livestock-herding interests.

Social acceptance of development projects in rural communities depends on the perceptions of the local people in relation to the available opportunities for them to participate effectively in a project. As a result, quite a number of failures are due to institutions which do not allow for proper participation (Kirsten, 2002). Moreover, the World Bank (2002) indicated that the involvement of non-government organizations (NGO's) in project implementation has seldom been tried, but this may be the key to a greater interest of the local population in becoming actively involved.

4.2.4. Economic aspects

The economic aspects are considered the most important in determining the impact of any investment in agriculture (including investments in livestock development projects). These lead to the impact and economic efficiency of the project in the development of the total economy, along with the efficient allocation of scarce resources. Economic aspects determine the value of the project from the viewpoint of farmer and society at large, and also determine the economic efficiency with which scarce resources are allocated (Van Rooyen *et al*., 2002).

Solarte *et al* (1994) cited Brumby (1987) as indicating that the direct economic value of animal products in the rural communities accounts for about half the total agricultural production of the value of livestock. This includes the provision of rural transport, draught power for cultivation, manure for crop production and their ability to utilize non-arable land, and the agricultural residues livestock provides. Livestock also plays a critical role in maintaining a cash flow for poor farmers who grow their crops essentially to provide food for their own households (Botsime, 2006). Tapson (1990) also included an aspect of equity through a concept of “non-human wealth”. Gandini and Villa (2003), and Bundy (1979) argued that meat and hides will always be sought after by that part of society which has enough purchasing power to acquire these products. To the livestock farmers, these products represent opportunities for generating income.

The internal economic problems of projects result mainly from budgetary constraints, high costs of maintenance and fuel, and low standards of infrastructure with resulting heavy expenses for transport and communication, as well as from a lack of management flexibility. But the main cause for concern lies in the fact that physical yields are not sufficient to justify the existing structure and costs. Initiatives to raise economic profitability must be directed towards increasing and stabilizing productivity (Dyson-Hudson, 1991). Vink (1986) believed that this could be achieved through an institutional approach.

Dyson-Hudson (1991) pointed out one particular economic problem of livestock development projects; he argued that total livestock production is reduced because of lack of pastures during the dry season. This often leads to livestock farmers being forced to purchase additional feeds which they often cannot afford due to their economic background.

Credit provision for necessary services, such as veterinary services, to poor livestock farmers, could play a major role in most livestock development project plans, but reports show low rates of repayment for various reasons (Lifran, 1994). The credit organisation usually tries to recover credit by subtracting all costs from the return of the first production output, which in turn reduces the interest due by farmers. The credit system must be modified (relaxed) to allow the repayment of credit throughout prolonged periods (Lifran, 1994).

Another economic concern is the constant changing of staff working on livestock development projects. Economic losses on most livestock development projects which occur because of staff members being transferred too frequently cannot easily be calculated, but must be of a substantial scale, judging from the low performance of the total system in which qualified staff plays such an influential role (World Bank, 2000).

4.2.5. Commercial aspects

Commercial aspects include the demand for the product on the market, effects on prices, value-added effects such as processing, effects on the domestic and/or export market, and the quality of the product. Input supply and demand issues include securing supplies such as medicines and drugs, and financing (Van Rooyen *et al.*,

2002). An evaluation of the livestock development project from the standpoint of a private investor aims at determining its commercial profitability. Only inputs and outputs that satisfy this objective function are included in the determination of the commercial aspect of projects at the prevailing market prices. Therefore commercial profitability may not adequately value the livestock development project from a social welfare perspective (Curry and Weiss, 2000).

4.2.6. Financial aspects

For the livestock development projects to be implemented, firstly, a financial plan will need to be prepared. Curry and Weiss (2000) argued that the plan must identify the total cash requirements of the project and their source - whether it will be private investors, NGOs, international donors such as the World Bank or International Monetary Fund (IMF) or national governments. Therefore, a financial statement at current prices will be required, incorporating forecasts of general price changes and the specific charge rates for major inputs and outputs.

The financial aspects are considered one of the most important areas in the livestock development projects, and most data has to be translated into financial forms for comparability. Financial variables are therefore crucial in determining the investments made on the projects (Phimister, 1994). Financial aspects include the financial effect of the project on participants that include farmers, donors, public corporations project agencies, and governments. How the beneficial effects of the project are distributed between all the stake-holders will depend on the financial arrangements, but a worthwhile livestock development project objective will be to meet its financial commitments while at the same time generating additional resources for the national economy (Curry and Weiss, 2000). Financial aspects are dealt with at various levels, that is, farm, and organizations level. At the farm level, financial data is often handled in farm budgets. Organisations often have formalized systems of financial accounting. In financial analyses mostly market prices are used, and profits are important.

Financial considerations of the livestock development projects, more especially for the poor livestock farmers, need proper financial analysis for various reasons, including the following (Van Rooyen *et al*., 2002):

- Assessment of the project's financial effect on farmers, public and participating organisations, by examining the current financial conditions against the projected future financial performance.
- Capacity of the project to return investments, and the repayment of loans.
- Assessment of the project's incentives structure that is whether the incremental income for farmers is enough to justify the existence of the project. For donors, NGOs and national agencies, is the project profitable enough to make necessary investments and lastly, is the return to investments large enough to allow sustainability of the project after the required initial investments?
- Assessment of the project's financial plans which includes identifying sources of required funds, repayment terms and conditions and the effect of inflation on the financial viability of the project.
- Assessment of financial management competence and identification of any necessary training.

4.2.7. Environmental aspects

Environmental aspects deal primarily with adverse biological and physical environmental impacts, such as droughts, preservation of bio-diversity, and environmental pollution as a result of livestock production systems (Lele, 1975; Byiringiro and Reardon, 1996).

Curry and Weiss (2000) argued that all development projects, including livestock development projects, have some effect on the environment, whether negative or positive, because either directly or indirectly livestock development projects will create some demand on the natural resources, and some waste products to be assimilated by the environment.

Squires (1981) pointed out that for livestock development projects, environmental factors include such fixed aspects as physiography and topography of the landscape. The same author indicated that environmental variables can be considered as the following:

- Resource density (resources, including all forms of animal food, water, shelter and shade).

- The distribution of resources over time such as seasonal effects and short-term responses to rain.
- The spatial distribution of resources for example the different plant species commonly found in extensive rangelands.
- The type, distribution and density of competitors for example other domesticated animals such as donkeys.

The other issue, which relates more to communal grazing areas in Africa, is that the practice of livestock production systems results in over-grazing of natural pastures by large ruminants. This practice has been thought to contribute towards the destruction of the natural ecosystems through its effects, such as soil erosion (Low, 1986; Squires, 1981). But Vink (1986) pointed out that degradation of the pastures can not only be attributed to overgrazing due to "tragedy of the commons" or common property practices characterising communal areas of South Africa because of theoretical, experimental and empirical evidence. Africa's grazing systems are characterized by agro-pastoralism and transhumance. Such systems were apparently sustainable in times of low population density, with little pressure on the natural resource base and with opportunities to move from degraded lands to new territories or to herd goats instead of cattle. These have, however, now been destabilised by development initiatives, which have removed former density-dependent constraints, such as veterinary care or reduction in tribal raiding, or have added new constraints such as reduction of range land area due to encroachment of crops and settlement of pastoralists; and increasing herd sizes (Pratt *et al.,* 1997).

Solarte *et al* (1994) cited Christiansson *et al* (1987) and Christiansson (1988) as indicating that the effects of destabilisation were evident in the Dodoma region of Tanzania. Solarte *et al* (1994) argued that the population growth resulted in rangelands being converted into cropping areas. At the same time, the livestock herds of the pastoralists were also increasing, and that resulted in uncontrolled over-grazing of the non-cultivable areas. This led to severe land degradation, threatening an ecological collapse of the region.

Livestock production is intimately linked with build-up of atmospheric carbon dioxide and methane, since emissions of carbon dioxide are caused mostly by burning fossil

fuel and tropical deforestation, and some 20% of methane emissions arise from digestive fermentation in the gut of herbivores, the methane itself contributing to some 15% of total greenhouse gases (Solarte *et al.*, 1994). Squires (1981) indicated that, though there are known benefits of animal manure towards maintaining soil fertility, still there are some negative impacts of animal manure towards the environment. He argued that excess manure may run into ditches and rivers or lakes, and such conditions may be unsuitable, or even harmful, for the aquatic life.

4.3. Disciplinary focus in livestock development projects

Given the many different technical specialists working on the livestock development projects, and the failure rate of such development projects, Cernea (1991) argued that the issue seems linked to the incorporation of social scientists on projects and more especially their place on the project cycle. Organisations such as The World Bank started using consultant anthropologists to help in projects appraisal for more than three decades, but with limited success so far (Lele, 1991).

Livestock development projects depend on the sustainable use of natural resources such as communal grazing lands, and communal dams for animals' drinking purposes (Curry and Weiss, 2000). Behavioural and socio-cultural variables of natural resource management are as important to resource sustainability as physical parameters. These socio-cultural variables need profound examination through the use of social science research methods, which could be achieved through employing the services of sociologists and anthropologists, since such social scientists are better suited at understanding socio-organisational patterns of managing local natural resources (Edgerton and Langness, 1974; Friedl and Whiteford 1988; Cernea, 1991).

Cernea (2005) argued that local culture plays an important role in agricultural development, and the primary components of culture are the diverse patterns and forms of social organisation within which people practise any form of agriculture. The same author went on to state that many of these patterns and forms are embodied in stable institutions and organisations, while others are informal and transitory. The relationships that build these patterns of social organisation are socio-cultural corner-stones, upon which agricultural production and productivity depend. Therefore, culture of agriculture also includes peoples' rationales and their dynamic

characteristics, mainstream and indigenous knowledge. The beliefs of people usually influence and shape their activities, aspirations, motivations and values.

The social research of patterns and forms of social organisations provides analytical knowledge, paves the way to transformation and improves social organisation of production. They are core components of development projects such as livestock development projects, since such projects do not happen in a vacuum but happen within the society, and for society (Brinkerhoff, 1991). National agricultural policies that focus on livestock development projects need this kind of knowledge to help them to move from their present state to what such policies prescribe for the future. Employment of appropriate social research leads to a high-yielding livestock sector, as well as high-yielding human systems (Cernea, 1991; Lele, 1991).

The documented failures of livestock development projects in many societies, as a result of numerous factors, could therefore greatly benefit from social research knowledge (World Bank, 1997). Benjamin (1985) argued that previous livestock development tended to focus on improving livestock and increasing the supply of their products, instead of including the incorporation and understanding of local organisational patterns and forms.

Livestock development projects which aim to help the poor livestock farmers need to focus on the poor farmers as well as the livestock. The livestock development planners need to understand the role livestock plays in the farmers' livelihoods, differing objectives for keeping livestock, the problems they face, and the opportunities they see. That kind of knowledge could be achieved through employing sociologists and anthropologists throughout all the stages of the project cycle, instead of using them at the time of project appraisal only (Cernea, 1991).

Livestock support should be provided where there is a clear opportunity to influence the livelihoods of the poor through livestock development projects. The support should therefore be influenced by a broader livelihoods analysis rather than a predetermined intention to work in the livestock sector which usually led to consideration of only technical parameters as against balancing them with socio-cultural variables. This type of support could possibly be achieved by a shift from an

exclusive emphasis on physical infrastructure to recognition of social structures (Cernea, 1991; Cernea, 2005).

Cernea (1991) indicated that it is important to note that economists are presiding most often over the means of project making, but have done little to incorporate cultural variables into the project models, whereas people's economic activities are embedded in a structure of social relations. Therefore, social scientists can help to identify, conceptualise, and deal with the social and cultural variables involved in livestock development projects. Livestock development projects, by their nature as financially driven interventions Cernea (1991), must provide complementary social or institutional reorganisation to avoid risks that may stay hidden, but which may eventually surface into unexpected and undesirable results. The same author pointed out that the study carried out by The World Bank, to examine the association between the socio-cultural fit or misfit of the project design and the estimated rate of return at the project completion, discovered that projects which incorporated socio-cultural variables in the design, had an average rate of return of 18.3% as against 8.6% for the projects that did not incorporate socio-cultural variables. Therefore the conclusion can be made that, when investments in technical infrastructures are done alongside disinvestment in socio-cultural and institutional structures within which the technical infrastructure is embedded, the project will be unsustainable and will fail.

4.4. Implementation of the Nguni project: Qualitative assessment

In this section a qualitative assessment will be given of the implementation of the Nguni project, based on a comparison of implementation of the Nguni project (determined through observation and interviews with implementers) with the considerations described so far in this chapter.

As pointed out in Chapter 1 the Nguni project was conceived in the early 1990s but actual implementation on two pilot sites occurred in the mid 1990s. This was due partly to the absence of sufficient project funding, and partly to the lengthy and intensive preparation stage which included identifying potential sites (communities), conducting appraisals, and consultations with local stake-holders (both individuals and organisations). These processes involved technical specialists such as some academics from the University of Fort Hare, regional livestock coordinators,

extension officers, as well as local community members in processes such as community profiling and reaching formal agreements.

This process is in line with Vink's (1986) conclusion that a full understanding of local community conditions is one of the prerequisites for successful development initiatives. On the other hand, the Nguni Project employed a Manager with knowledge of local values, customs and livestock-keeping conditions and tasked him with the responsibility for community profiling Raats (2008, personal communication). This is in contrast to Cernea's (1991) view that community profiling should be carried out by trained social scientists. Nevertheless, observation during the course of this research did not suggest any evidence that this had any negative impact on the Nguni project.

Van Rooyen *et al* (2002) pointed out that a detailed and realistic project management plan is a prerequisite for successful implementation. During the course of this research, observations and interviews with staff members of the Nguni project indicated that there was a willingness to adapt the implementation process so as to accommodate obstacles and other learning experiences as they occurred. Such adaptability took into account the situations and views of the beneficiaries, the implementers (University of Fort Hare) and sponsors (Industrial Development Cooperation, Development Bank of Southern Africa).

Implementation of the project considered technical, institutional, social, economic, commercial, financial as well as environmental aspects. This was achieved through proper community profiling, employment of Rapid Rural Appraisal and Participatory Rural Appraisal processes, regular meetings and workshops held to built the necessary capacity in all stakeholders as well as establishment of trusts to properly address issues such as common property problems that characterise communal use of grazing resources. This is in line with Vink's (1986) recommendation when he noted the need for developmental policy and initiatives to evolve from an original position of the *tragedy of the commons* to viewing livestock as a store of wealth and ultimately to institutional analytical approach.

4.5. Concluding remarks

So far in this dissertation the focus has been on *the role of livestock in communal areas* (Chaper 2) and *critical factors in rural livestock development projects* (this chapter).

The qualitative assessment at the end of Chapter 2 indicated that the Nguni project was designed and implemented in a way that is consistent with the traditional values and customs of rural communities, while it also accommodates the possibility of commercially marketing higher-value produce (organically produced meat, and hides) for cattle owners who may choose this option; however, this is envisaged only after three to five years after implementation.

Similarly, the qualitative assessment of the Nguni project in terms of critical factors determining successes and failures in rural livestock development projects suggested that the Nguni project is consistent with the prerequisites for success; while no factors that usually cause failure were identified.

It is relevant to note, however, that both of these assessments are based on broad characteristics of the Nguni project as well as broad criteria used in the assessment. The Nguni project consists, for the purpose of this research project, of 40 individual projects; it is of course conceivable that some of these are more successful than others.

Therefore, it was considered necessary to undertake a survey of a sample of these individual projects in order to pursue the research further at that level. Chapter 5 describes the research methods employed in that part of this research project.

HAPTER 5
Research methods

This chapter will present the research methods that were employed. Data collection activities, the sample frame, sampling procedure, and the survey are described. Description of the survey includes components such as the questionnaire, interviewing procedure, and questionnaire coding and data analysis.

5.1. Selection of individual projects in survey

The aim of the research is to provide a critical description of the design, implementation and effects of the Nguni project in the Eastern Cape Province of South Africa. It was important that the interviewees were selected from all sectors of the population which had a chance to participate in the Nguni project. Bearing in mind that the unit of research was decided to be an individual project, it would be necessary to interview at least one representative of each selected project.

The project was introduced in three schools, eight farms and 44 communities during the period 2004 to 2007. Investigation for this particular study was limited to individual projects that had been in existence for at least two years, otherwise it would not be reasonable to explore the effects of the project on the communities. Land tenure system was another consideration: In the case of the 44 communities, a communal tenure system is in existence, whereas schools and farms involved some form of "individual" ownership of land.

In all 29 individual projects from the communities, three projects from schools and eight projects from farms qualified to be included in this study. Of these, 15 out of the 29 individual projects from the communities, all eight individual projects from the farms and all three individual projects from the schools were selected to be part of the study.

Selection of the individual projects to be investigated was based on available research funds, difference of Local Municipality and land tenure. A representative of each individual project was identified and chosen by the project participants themselves. These representatives were then interviewed.

For each community project selected, a respondent who was not involved in the Nguni project was also nominated by the community. This was to allow overall comparison of community participants with non-participants.

In addition the Nguni Project leader, the project co-ordinator, community facilitator, community liaison officer and the project animal technician were asked to shed some light on certain important issues relating to the project as a whole.

5.2. Selection of non-participating respondents

While the primary focus of the research was to obtain facts and opinions relating to the individual projects, it was considered relevant to also obtain some views with respect to non-participation. In order to retain the main focus of the research project, and keeping in mind expenses, it was decided to match the participating projects on a one-to-one basis with non-participants. Thus, in each location where a participating project was selected, one representative of non-participants in the Nguni project was selected. Suitable individuals were identified in each location by the participants, and an individual was randomly selected.

While such a selection process does not render the selected individual a representative sample of all non-participants in the particular community, the information obtained was not used to draw inferences about the non-participants in the specific location due to a sampling frame of one non-participant per community; instead, this was expected to yield useful information in an overall comparison of the views of non-participants with those of participating groups.

Project leader, project co-ordinator, community facilitator, community liaison officer and the project animal technician were asked to shed some light on certain important issues.

Table.5.1: Sample of villages.

Village	District Municipality
Kwezana	Amatole
Msobomvu	Amatole
Jojozi	Amatole
Upper Gqumashe	Amatole
Ngqele	Amatole
Ncera	Amatole
Kamastone	Chris Hani
Gxwedera	Amatole
Ntselamanzi	Amatole
Bell	Amatole
Upper Mnxe	Chris Hani
Mthimde	OR Tambo
Didikana	Amatole
Masele	Amatole
Dyam-Dyam	Amatole

Table 5.1 indicates villages and their respective District Municipalities that the researcher visited for data collection. A total of 15 villages were visited, two representatives per village were interviewed.

Table 5 .2: Sample of schools and farms

Farms/Schools	District Municipality
Winterberg (school)	Amatole
Phandulwazi (school)	Amatole
Emfundisweni (school)	OR Tambo
Bolotwa (farm)	Chris Hani
Mzamowethu (farm)	Amatole
Masiphathisane (farm)	Amatole
Nompumelelo (farm)	Chris Hani
Indwe (farm)	OR Tambo
Mampondomise (farm)	Alfred Nzo
Platform CPA (farm)	Amatole
Upper Hazelden (farm)	Chris Hani

Table 5.2 indicates farms and schools with their respective District Municipalities that were visited by the researcher for data collection. A total of 11 respondents were interviewed.

Table 5.3: District Municipalities with their corresponding sites

District Municipality	Communities, Farms and schools
Amatole	Winterberg, Phandulwazi, Kwezana, Msobomvu, Jojozi, Tyutyuza, Upper and Lower Gyumashe, Ngqele, Ncera, Gxwedera, Mankazana, Ntselamanzi, Bell, Mzamowethu, Masiphathisane, Platform CPA, Didikana, Masele and Dyam-Dyam
O.R.Tambo	Emfundisweni, Indwe and Mthinde
Chris Hani	Kamastone, Bolotwa, Nompumelelo, Upper MnxeUpper and Hazelden
Alfred Nzo	Mampondomise

Table 5.3 indicates the four District Municipalities that the researcher visited for data collection with their respective communities, farms and schools.

5.3. The survey

5.3.1. The questionnaire

A one questionnaire was prepared for both non-participants and participants. On completion of the questionnaire, a pilot survey was carried out on one village to test the validity of the questionnaire. This led to certain changes being made. These changes comprised the inclusion or deletion of certain questions, or the rephrasing of some of them.

A separate set of questions was prepared to elicit information from the project planners and facilitators. The reason for the use of a questionnaire is that it is the most used tool of descriptive research in social sciences (Brown, 2000). It allows the researcher to capture the necessary factors in an area of concern, such as values and preferences of the respondents, their level of knowledge and how informed are they, and their beliefs and attitudes. The nature and relevance of the questions was influenced by an observation phase of the research, a pilot survey and some specimen questions from previous researches. The questionnaires are included as appendices A and B.

5.3.2. Interviewing procedure

All the interviews were conducted by the researcher with assistance from one enumerator for the purpose of language clarity since the researcher is not a native

speaker of isiXhosa. The questionnaire was administered personally for the purpose of gaining the benefits of personally administered questionnaires such as: the establishment of rapport in order to be able to clearly explain the purpose of the research, and the easiness of its nature, and to come up with a high response rate (Brown, 2000). The questionnaire was written in English, but questions were asked in Xhosa so that respondents could provide clear responses, Xhosa being their mother tongue. Barbour (2008) indicated that it is important to preserve confidentiality and anonymity. In order for the researcher to dispel respondents' suspicions and mistrust, which usually arise from the lack of anonymity of the personally administered questionnaire, the researcher was introduced to the participants by some of the project implementers who were already known to them. Secondly, the respondents were told of the confidentiality of their responses and assured that their names would not be used in any way for the research. Non-participants were given the same assurance of confidentiality as the participants.

Most of the respondents responded eagerly to the questions being asked, as they saw the interviews as their opportunity to put across their problems and aspirations, with the hope that the research would go a long way towards solving their problems and meeting their aspirations for the future.

5.3.3. Questionnaire coding and data analysis

The coding of the questionnaire was done by the researcher, using the Microsoft Exel programme. Analysis of the data was carried out, using the Statistical Package for the Social Sciences (SPSS), as Argyrous (2005) noted that SPSS is a widely used statistical package for analyzing data.

The nature of the data allowed a Chi-square test to be used in order to determine the significance of the difference(s) between participants and non-participants, on almost all the variables considered. The Null Hypothesis is that there is no observed difference between participants and non-participants; the Alternative Hypothesis is that there is an observed difference between participants and non-participants. The Alternative Hypothesis will be accepted (meaning there is a significant difference) if the Chi-square test reveals a Pearson Chi-square Asymptotic significance greater than 0.05 (5%). From the Chi-square test, consideration will not be given to Likelihood Ratio and Linear-by-Linear Association because they both serve the same purpose as

the Pearson Chi-square. If the Null Hypothesis is rejected, it means that there was an association between the analysed variables and the participation. If it is accepted it means that there was no association between the variables and participation in the project. The data was also analysed by Cross Tabulation which led to descriptive statistics in the form of percentages, tables and graphs.

There were some open-ended questions that had to be interpreted qualitatively. Looking at the explanations, or accounts, provided by the respondents can reveal and unpick the mechanisms which link particular variables through the use of qualitative analytical procedures. Although qualitative and quantitative interpretations answer different questions researchers often have common interests in seeking to understand a particular phenomenon. That it is why the two methods will both be used, to complement each other (Barbour, 2008).

CHAPTER 6

Presentation and analysis of findings

This chapter will present and analyse the findings. It consists of four sections. The first section will focus on findings from qualitative section of the research project, followed by the second which focuses on findings in respect of the individual projects. The third section will focus on views of the non-participants, while the last section will focus on exploration of comparisons between participants and non-participants.

The presentation will relate to facts, views and opinions met on individual projects. The main focus will be on findings from the individual projects since they were considered as the unit of study; views from non-participants and comparisons between the participants and non-participants will be treated as an exploratory exercise to find out what it can yield.

6.1 Findings in respect of project implementation

This section will present an analysis of the findings from the qualitative section of the research project which are derived from "Implementation of the Nguni project "Roll-out of the Nguni project" and the "Research component of the Nguni project

As indicated in chapter 4 the Nguni project was initiated in early 1990's. Two pilot projects in Melani and Dyamala villages in Amatole Local District Municipality were started in mid-1990's through funding from Norwegian government. Implementation was preceded by project identification, preparation and appraisal. Community profiling was done on all sites where the project was introduced. The reason for this was to obtain information relating to existing socio-economic conditions of the individual sites and environmental resources and potential of those different areas in order to determine the viability of the whole project before actual roll-out of the project to the communities.

The planners and implementers of the project realized the need to avoid some of the problems that characterise livestock development projects by familiarising themselves with local conditions of all the areas that were chosen for the project. For inclusive participation by all the stakeholders in all the project cycle stages as indicated in

chapter 1, Rapid Rural Appraisal and Participatory Rural Appraisal approaches were employed.

The roll-out has covered more than 50 sites including three schools and eight farms in the six Local District Municipalities. Each area received 12 animals that comprise of two bull and 10 heifers, total number of animals given is more than 600. During the whole roll-out process there were budget constraints that were created by the scattering of the individual projects, their number and conducting activities such as evaluation and monitoring the individual projects.

A research component is one of the objectives of the Nguni project as indicated in chapter 1. Research was conducted on the following areas; general animal welfare, marketing and meat science. This goes along with an objective of creating a niche market for organic Nguni beef and hides.

6.2 Findings in respect of individual projects based on survey

This section will focus on changes that occurred within three years period on the number of animals within the individual projects. That is, their initial, current and percentage increases will be dealt with as well as the sub-totals of schools, farms and communities in order to determine the direction of the Nguni project.

Table 6.1 indicates original number of animals that were given to communities, schools and farms, and their current numbers. They were all given 10 heifers and two bulls. The highest average increase was experienced in schools at 108.3%, followed by communities at 55.0% and farms with 46.9%. There is an overall increase of animals at different degrees on all the locations except on two communities where decreases of 8.3% and 66.7% were experienced. On the community where the current number of animals is 11, deaths due to diseases were indicated to be the cause of the decrease and on the community where the current number of animals is four vested interest of the local extension officer led to its hijacking as a result animals were indicated to be stolen.

Table 6.1 Cattle numbers by individual projects

Project	Initial	Now	% Increase
School 1	12	31	158.3
School 2	12	28	133.3
School 3	12	16	33.3
Farm 1	12	16	33. 3
Farm 2	12	19	58.3
Farm 3	12	21	75
Farm 4	12	21	75
Farm 5	12	15	25.0
Farm 6	12	17	41. 7
Farm 7	12	13	8. 3
Farm 8	12	19	58. 3
Community 1	12	23	91. 7
Community 2	12	14	16. 7
Community 3	12	18	50.0
Community 4	12	23	91. 7
Community 5	12	24	100.0
Community 6	12	25	108. 3
Community 7	12	23	91. 7
Community 8	12	18	50.0
Community 9	12	21	75.0
Community 10	12	19	58.3
Community 11	12	23	91.7
Community 12	12	11	-8.3
Community 13	12	4	-66.6
Community 14	12	19	58.3
Community 15	12	14	16. 7

Table 6.2 below indicates the total number of animals initially and currently, as well as the percentage increases. Overall (26 individual projects) there was an increase of 183 animals (58.7%) over the two-year period. Overall, schools (3) showed the greatest relative increase, namely 108.3%.

Table 6.2 Cattle numbers by project categories

Areas	**Initial**	**Now**	**% Increase**
Schools (3)	36	75	108.3
Farms (8)	96	141	46.9
Communities (15)	180	279	55.0
Total (26)	**312**	**495**	**58.7**

The differing percentage increases of animals on schools, farms and communities can not be attributed to a single reason such as tenure system even though it is obvious

that schools and farms are under private ownership whereas communities are under unitary management. The reason could be due to different management practices between and within the different sites or both tenure system and management practices.

6.2.1 Management aspects

Perret (2002 p. 217) cited Landais (1992) as indicating that a livestock production system is "a range of interacting elements and technical methods organised in order to manage the resources, in order to gain different products from animals (milk, meat, skin and leather, traction force, manure, etc) or for other objectives". Therefore livestock management factors, whether within development projects such as the Nguni project, or outside of the project, often reveal important patterns and relationships which are inherently tied to institutional set-ups within specific localities, and which can have a positive or negative influence on the general performance of livestock. Under management aspects, a number of factors were investigated, including feeding, assessment of the grazing conditions and breeding, as well as health factors.

6.2.1.1 Feeding and water

Table 6.3 below indicates responses of individual projects on issues relating to feeding of Nguni cattle. All the projects use a free-range grazing system, with dams as drinking water source. Farms/schools use supplementary feeding (energy/roughage) in dry seasons mostly for calves (42%). This can be attributed to different management systems found on communal projects and farms/schools. Due to the fact that schools and farms have ownership of the piece of land they farm on, they are able to grow their own fodder on which can be preserved to be fed to animals in dry seasons. Dams and streams account for 100% and 88% usage respectively.

Table 6.3 Sources of feeding and water

Responses	Farms/schools	Communities	Total	%Total
Free-range	11	15	26	100
Supplementary	11	0	11	42
Dams	11	15	26	100
Streams	8	15	23	88

n=26

6.2.1.2 Assessment of rangelands

Chapter 2 indicated that Eastern Cape Province is arid this and was found to be true especially for two of the Local District Municipalities inclused, Amatole and Chris Hani. It was found that conditions of rangelands in those two Municipalities are not very good; this could be attributed to aridity, overgrazing or both of them. In OR Tambo and Alfred Nzo Local District Municipalities rangelands conditions were much better; this could be attributed to good rains as indicated by Table 6.4. Table 6.4 below indicates possible causes of the state of rangelands. It should be noted that the respondents were not restricted to giving a single cause for the current state of rangelands, and some cited more than one cause. Poor fencing appeared to be the most cited reason for current deteriorating conditions and it affects communities than farms/schools as indicated by 11 project representatives. It was interesting to note that 42.% believed that improving rangelands conditions were the result of good rains, this was more apparent in OR Tambo and Alfred Nzo than in Chris Hani and Amatole District Municipalities. As can be seen from Table 6.4 problem of small grazing areas is only experienced in the communities. Poor grazing practices, poor soils and bush encroachment were the least cited possible causes of the current state of rangelands.

Table 6.4 Probable causes of grazing conditions

Causes	All participants	Rank	Farms/ schools	Communities	Total %
Poor fencing	14	1	3	11	53.8
Good rains	11	2	6	5	42.3
Low rainfall	10	3	3	7	38.5
Veld fires	6	4	2	4	23.1
Small grazing areas	4	5	0	4	15.4
Poor grazing practices	2	6	2	0	7.7
Poor soils	2	6	1	1	7.7
Bush encroachment	2	6	0	2	7.7

n=26

6.2.1.3 Percieved problems within grazing areas

Table 6.5 below indicates the ratings of perceived problems within the grazing areas. The majority of projects (53.8%) cited inadequate fencing as the main problem. This is an indication of unsatisfactory involvement by the Local District Municipality, since fencing of grazing areas falls under their jurisdiction. The least cited problem was the size of grazing areas (15.4%) which means that bad performance by some of the projects can be attributed to other factors rather than the size of grazing areas.

Table 6.5 Rating of percieved problems within grazing areas

Problems	P	Total %
Inadequate fencing	14	53.8
Inadequate water	13	50.0
Small grazing areas	4	15.4
Veld fires	8	30.8

P=Projects; n=26

6.2.1.4 Animals' body conditions

Body conditions of cattle can give an indication of their productiveness. Chapter 2 indicated that Eastern Cape Province is mostly arid, which can affect animals' body conditions, therefore the researcher found it necessary to investigate seasonal body conditions of the the Nguni cattle in the individual projects. Table 6.6 below indicates views from individual projects relating to seasonal body conditions. As can be expected, the majority view of the projects is that body conditions are poorer in winter (80.7%) than in other seasons.

Table 6.6 Seasonal body conditions

Season	Exellent	Good	Poor
	Responses	Responses	Responses
Spring	6	20	0
Summer	6	20	0
Autumn	6	21	0
Winter	0	5	21

n=26

6.2.1.5 Percieved rangelands improvement initiatives

Representatives of the projects were asked to give their views on initiatives that can be emloyed to improve their rangelands. As indicated by Table 6.7 below, 53.8% believed that proper fencing can improve their rangelands, as compared to 30.7% that indicated that good grazing practices can help. This means that respondends believed that their grazing practices are still good.

Table 6.7 Perceived initiative to improve grazing conditions

Initiatives	Responses	Total%
Fencing	14	53.8
Good grazing management	8	30.7

n=26

6.2.2 Breeding aspects

It should be noted that animals that were given to different communities, farms and schools were not bought by the community members participating in the projects or school/farm management but by the Nguni project implementers. But representatives of the individual projects were asked to shed light on issues relating to breeding aspects since it is expected that the project will be sustainable therefore their views might apply in future.

6.2.2.1 Selection of breeding stock

Table 6.8 below indicates that performance, health conditions of the animals and body conditions were the most cited reasons for selecting breeding stock. It is encouraging to note that respondents considered performance as one of their main reasons for selecting breeding stock, because this implies that they value productivity highly. Age of the animals was not considered. It should be noted that the respondents were not restricted to giving a single response for their selection of breeding stock; some cited more than one factor. Mrwetyana and Mzileni (Personal communication, 2007) pointed out that technical aspects such as age and performance of the animals were not the only factors that determined the animals bought for the communities; history of the breeder and origins of the animals were also considered in order to avoid buying animals that were not pure-bred. The most notable difference when comparing farms/schools with communities is on health, 5 represantatives from farms/schools indicated that they consider health, as against 14 representatives from communities.

Table 6.8 Factors considered in selection of breeding stock

Responses	All participants	Rank	Farms and schools	Communities	Total (%)
Performance	21	1	10	11	80.7
Health	19	2	5	14	73.1
Body condition	15	3	6	9	57.7
Temperament	12	4	6	6	46.2
Conformation	6	5	1	5	23.1
Age	0	6	0	0	0

n=26

6.2.3 Reproduction

Table 6.9 indicates responses with respect to reproduction factors. It can be seen that uncontrolled mating occurred in 57.7% of cases. Only 3.8% of respondents indicated that they castrate their calves to get rid of unwanted traits. Miscarriage was experienced by 11.5% of the projects whereas weaning after 12 months was done by 23.1% of the projects. All representatives of the projects indicated that survival rate after weaning of the calves is 100%. This might be attributed to their weaning methods. Only 19.2% indicated that they use kraals to house the calves.

Table 6.9 Responses of reproduction factors

Variable	Responses	Total %
Unconrolled mating	15	57.7
Weaning after 12 months	6	23.1
Calve housing (kraal)	5	19.2
Miscarriage	3	11.5
Calves castration	1	3.8

n=26

6.2.4 Health aspects

Health aspects in livestock production are very important, especially in development projects, because they have a greater bearing on the continuity and sustainability of such projects. Therefore, it was important for the researcher to ask questions that relate to the health of the animals.

6.2.4.1 Mortality, prevalent diseases and internal parasites

Table 6.10 below indicates major causes of mortality. Predators were not cited, and extreme weather (3.8%) was the least cited caus of mortality of the cattle. Diseases

were considered as the major cause of mortality, which means serious consideration should be given to health practices in order to alleviate the problem of mortality, as high numbers of deaths can lower production levels.

Table 6.10 Major causes of mortality

Causes	Responses	Total % of Yes
Diseases	20	76.9
Poor diet	5	19.2
Extreme weather	1	3.8
Predators	0	0

n=26

Respondents were asked about diseases prevalent in their areas, as indicated by Table 6.11 below. The most prevalent disease appeared to be gall sickness, as indicated by 96.2% of respondents. Red water was the second most prevalent disease as 84.6% of respondents indicated having experienced it. Foot-rot appeared to be the least prevalent disease. It should be noted that the respondents were not restricted to giving a single response to this question, and some cited more than one disease. Comparing farms/schools with communities reveals no apparent difference between them as far as diseases are concerned. All the mentioned diseases affects both groups in more or less the same way.

Table 6.11 Prevalent diseases

Disease	Responses	Rank	Farms and schools	Communities	Total %
Gall sickness	25	1	11	14	96.2
Red water	22	2	10	12	84.6
Lumpy skin	17	3	8	9	65.4
Black quarter	10	4	4	6	38.5
Foot rot	5	5	2	3	19.2

n=26

Table 6.12 below indicates methods that were used to control internal parasites. It can be seen that most of the respondents indicated dosing as the commonly practised method, though 30.8% of the respondents indicated that they vaccinate their animals. Only 23% of the respondents indicated that they have never controlled internal parasites. This may be due to low levels, or total absence, of internal parasites.

Table 6.12 Control of internal parasites

Method	Responses	Percentage (%) of total
Dosing	12	46.2
Vaccination	8	30.8
Never	6	23.0
Total	**26**	**100**

6.2.4.2 Dipping

Steyn (1988) pointed out several problems experienced by livestock farming in South Africa among which are inadequate support structures such as shortage of dipping tanks especially in communal areas. Table 6.13 below indicates dipping frequencies. It can be seen that the majority of respondents (76.9%) dip their animals once in two weeks followed by once per month and only 3.8% indicated that dipping occurs once per week. Dipping frequencies would suggest that there would be no or minimal presence of ticks on the animals but observations indicated opposite situation that is, most of the Nguni cattle seen on survey had ticks on them.

Table 6.13 Dipping frequency

Frequency	Participants	Percentage (%) of total
Once/week	1	3.8
Once/2 weeks	20	76.9
Once/month	5	19.3
Total	**26**	**100**

6.2.5 Perceptions towards the project

Participation by local populations within the development projects is influenced by, among other factors, social aspects, of which some are their perceptions. Perceptions are important in the sense that they give a good clue concerning the target populations' aspirations, desires and levels of understanding on what is expected of them, and how much they can contribute towards the success of a development project. Therefore, the researcher had to ask questions that related to their perceptions in order to find patterns and relationships within their answers that would help to clarify the motives behind their actions relative to the project.

6.2.5.1 Perceptions of overall project implementation

Table 6.14 below indicates some of the responses to questions about perceptions of participants. It can be seen that all the participants indicated that they were notified about the project through personal visits by some of the project implementers, Khanyisa, Somyo and Mzileni (2007). All the participants also indicated that the project suited their future income needs, and the planning process was all inclusive and gender balanced. It is interesting to note that only 11.5% of participants indicated that they would prefer individual ownership of the project. This is an indication of the high level of satisfaction by participants on the structure of the project, which usually leads to increased participation in the activities of the project. It was sad to note that only 26.9% had had some form of livestock production training. Low levels of livestock production training might have contributed to some of the low performances by some of the projects.

Table 6.14 Participants perceptions

Stament	**Total**	**Percentage (%) of total**
1. Notification by personal visits	26	100
2. Objectives of the project suited participants' needs and aspirations (future income)	26	100
3. All inclusive planning process and gender balanced	26	100
4. Participation from inception	24	92.3
5. Timely arrival of livestock	24	92.3
6. Healthly body conditions of animals at arrival	23	88.5
7. Hired labour for herding of animlas	12	46.2
8. Trained community members in livestock production before arrival of animals	7	26.9
9. Agricultural specialists trained the community members	6	23.1
10. Freedom of joining the project at later stage	26	100
11. Working relationships between participants and non-participants	14	53.8
12. Preference for individual owership of the project	3	11.5

n=26

6.2.5.2 Participants' livestock production training

Participants were asked to provide one or more answers on areas in which they felt they needed training in order to run the project successfully, as indicated by Table 6.15 below. Health management appeared to be the most quoted area, as indicated by 88.5%. This implies that capacity building should be given serious consideration in order to improve the performance of the projects. Feeding management was the least

chosen area, indicating that participants believed that they still employ proper feeding practices.

Table 6.15 Required training to run the project

Area	Responses	Total %
Health management	23	88.5
Calf rearing	14	53.8
Breeding management	13	50.0
Rangeland management	9	34.6
Marketing	9	34.6
Record keeping	6	23.1
Feeding management	1	3.8

n=26

6.2.5.3 Participant-perceived problems in running the project

Table 6.16 below indicates percieved problems in running the project.The majority of the participants (76.9%) cited lack of feed resources as their major concern. This means that supplementary feeding offers substantial relief to this problem. Only 3.8% of participants cited mortality as a problem which means they do not really consider it as a constraint in running the project.

Table 6.16 Perceived problems in running the project

Problems	Responses	Total %
Feed resources	20	76.9
Extension services	8	30.8
Veterinary services	8	30.8
Rangeland management	7	26.9
Livestock production skills	7	26.9
Suitable breeding stock	6	23.3
Diseases and parasites	5	19.2
Infrustrature	5	19.2
Stock theft	5	19.2
High mortality	1	3.8

n=26

For each individual project on all the different groups (farms, schools and communities) that were given the animals, findings indicated that schools experienced the highest average increase in animals' number. It was found that free-range grazing system is the most dominant practiced feeding system within the projects. Indications from the findings are that there is a lack of involvement by the Local District

Municipalities due to apparent poor infrastructure such as fencing that is believed to lead to poor grazing conditions which is mostly apparent in winter. Performance is the most highly regarded breeding trait. Within the projects uncontrolled mating is the most common mating practice. Animals are mostly dipped once per two weeks within the projects and diseases are the major cause of deaths as indicated by the desire of the project representatives to be trained specifically on animals' health management.

6.3 Views of non-participants on the project

This section will deal with issues and opinions of non-participants that are only relating to the Nguni project. Since the unit of study is an individual project, findings from this section will not be used as the major basis for conclusions but will supplement where it is found to be necessary.

6.3.1 Perceptions of non-participants on the project

Table 6.17 indicates some of the perceptions of non-participants on the project. Lack of time appeared to be the main reason why they did not join the project, and 60% indicated that they would consider joining if they had the time. Only 6.7% indicated that they were not comfortable with the project. This is an indication of good relationships between participants and non-participants. They all indicated that they get bull support from the project meaning that the Nguni project is meeting one of its objectives.

Table 6.17 Non-participants perceptions

Stament	**Total**	**Percentage (%) of total**
1. 'Word of mouth' means of knowing about the project	15	100
2. Lack of time for not joining the project	14	93.3
3. Will consider joining the project if time allows	9	60
4. Are comfortable with the project	14	93.3
5. Get bull support from the project	15	100

n=15

6.3.2 Non-participant perceived improvements in the project

Non-participants were asked to give their views concerning improvements that should be introduced into the project. Table 6.18 below indicates percieved improvements. Some of the non-participants (40%) belived that the number of bulls was low as compared to the number of heifers, therefore the number of bulls should be increased.

Proper fencing and dipping facilities were other improvements that non-participants thought should be given consideration. The least cited improvement was provision of drinking water, which indicates that this is not a serious problem.

Table 6.18 Perceived improvements in the projct (Non-participants)

Improvements	**Non-participants**	**Percentage (%)**
More bulls	6	40
Supplementary feeding	3	20
Fencing and dipping facilities	5	33.3
Water provision	1	6.7
Total	**15**	**100**

6.4 Exploration of comparisons between participants and non-participants

This section presents a comparison of views between participants and non-participants in the Nguni project. This is done on an overall basis, and not on a community-by-community basis. Because of the nature of the sampling process, findings from this section will only serve to augment findings from the individual projects where it is found to be necessary.

6.4.1 Assessment of rangelands (participants and non-participants)

Communal rangelands are a communal property and are characterised by problems such as overgrazing. Communal rangelands are used by both non-participants and participants in the same way, so it was important to find out views of both users. It can be seen from Table 6.19 that majority of respondents (76.7%) indicated that conditions are deteriorating as compared to 23.3% that indicated that conditions are improving and the improvement is attributed to good rains. Poor fencing is indicated as the major of deteriorating cause of the conditions whereas poor soils and bush encroachment are the least cited causes.

Table 6.19 Comparisons of causes of grazing conditions

Causes	Participants	Non-participants	Total % of Yes
Poor fencing	11	10	70.0
Low rainfall	7	10	56.7
Good rains	5	2	23.3
Veld fires	6	4	33.3
Poor grazing practices	2	3	16.7
Small grazing areas	4	0	13.3
Poor soils	1	1	6.7
Bush encroachment	2	0	6.7

n=30

6.4.2 Comparisons of perceived problems with grazing

Table 6.20 below indicates percieved problems within the grazing areas. The majority of respondents (70.0%) cited inadequate fencing as the main problem. This is an indication of unsatisfactory involvement by the Local District Municipality, since fencing of grazing areas falls under their juristriction. The least cited problem was the size of grazing areas (13.3%) which means that bad performance by some of the projects can be attributed to other factors rather than the size of grazing areas.

Table 6.20 Comparisons of percieved problems within grazing areas

Problems	P	N-p	Total %
Inadequate fencing	11	10	70.0
Inadequate water	9	7	53.3
Small grazing areas	4	0	13.3
Veld fires	6	3	30.0

P=Participants; N-p=Non-participants; n=30

6.4.3 Comparisons of perceived rangelands improvement initiatives

Respondents were asked to give their views on initiatives that can be emloyed to improve their rangelands. As indicated by Table 6.21 below, 73.3% believed that proper fencing can improve their rangelands, as compared to 20.0% that indicated that good grazing practices can help. This means that respondends believed that their grazing practices are still good. Other respondents did not respond to the question.

Table 6.21 Perceived initiatives to improve grazing conditions (both groups)

Initiatives	Participants	Non-participants	Total % of Yes
Fencing	11	11	73.3
Good grazing management	3	3	20.0

n=30

6.4.4 Comparisons of perceptions on the project

Non-participants as members of the communities where the Nguni project was introduced are aware of the activities happening within the individual projects and they have their own views and opinions towards some of the activities within the project such as on livestock conditions and management practices. Therefore, comparisons will be done between non-participants and the projects' representatives (only those in the communities, this means farms and schools will be excluded) on certain issues that might add value towards the whole study. Table 6.22 below indicates some of the personal views on both participants and non-participants. It can be seen that 100% from both groups is comfortable with the project and they were all notified about the project though 60% of the non-participants as compared to 100% of the participants indicated that they can be free to join the project when conditions allow.

Table 6.22 Comparisons of opinions on the project

Statement	Participants	Non-participants	Total	Total %
Comfortable with the project	15	15	30	100
Freedom of joining the project	15	9	24	80
Notification about the project	15	15	30	100

n=30

6.4.5 Comparisons of perceived improvements on managerial activities

Managerial activities are important for any livestock enterprise. Therefore, it was important for the researcher to have a clear picture on how the respondents perceive such activities.

Table 6.23 below indicates common views between participants and non-participants on issues relating to some of the managerial activities that they belief can improve

efficiency of the project. Suitable breeding stock and feed resources were cited by 40% as compared to improved infrastructure which was cited by 33.3%.

Table 6.23 Perceived improvements on managerial activities (both groups)

Improvements	Participants	Non-participants	Total	Total %
Suitable breeding stock	6	6	12	40.0
Feed resources	9	3	12	40.0
Infrastructure (fencing, dipping tanks)	5	5	10	33.3

n=30

6.4.6 Associated factors

Table 6.24 below shows factors that were found to be significantly associated with participation in the project. Their p-values are lower than 0.05 (5%) meaning Null Hypothesis is reject for all of them. These variables were tested in all the individual projects and in all the non-participants.

Table 6.24 Associated factors

Variables	χ^2	p-value	df	Results
Leadership position	5.487	0.019	1	Reject
Role models	6.190	0.013	1	Reject
Notification about the project	5.611	0.018	1	Reject
Cattle keeping	6.000	0.014	1	Reject
Non-agricultural intervention	7.778	0.005	1	Reject

n=30

Findings showed that all participants and non-participants indicated that they were all aware of the project before it was introduced and 60% of the non-participants as compared to all the participants indicated that they can join the project if their conditions allowed. There were three major improvement initiatives suggested by both groups; suitable breeding stock, supplementary feeding and improved infrastructure appeared to head the list of suggested improvements. Lastly findings pointed to a number of variables (Table 6.24) that signified association with the project.

CHAPTER 7
Overview and conclusions

This chapter will focus on interpretation of the findings of the previous chapter, and draw conclusions from these. The presentation will follow the general format of the research questions.

7.1 Overview

Chapter 1 has offered an insight into livestock farming in South Africa, which is categorized into two main categories - commercial and communal agriculture. The main focus was on communal livestock farming due to its strategic importance to the Nguni livestock development project. The reason for this was to understand the characteristics and factors that have a bearing on communal livestock farming, in order to analyse the suitability of the Nguni project within the specific localities. It transpired that communal livestock farming is associated with multiple objectives, therefore, for livestock improvement initiatives to succeed in communal areas, a clear understanding of the needs and aspirations of the rural population is a starting point. Objectives, structure and implementation procedure of the Nguni project were also highlighted in order to establish a correlation between them and the needs and aspirations of the rural communities.

Description of the study area was also dealt with in detail on issues such as topography, climate, vegetation, soils, hydrology and water resources, as well as natural resource management. The reason for this was to establish whether the Nguni project would be viable under the existing natural environmental conditions. From the review of related literature of the study area, it transpired that this is more suited to livestock farming than crop farming, therefore an initiative of introducing livestock improvement was a better agricultural exercise. As stated in chapter 3, livestock play different roles in the lives of the rural communities. It became important to highlight the roles that livestock play, in order to match the suitability of the project's objectives with the expectations of the rural communities.

Literature related to rural livestock development projects, revealed that most of such projects fail. A number of reasons were cited for failures, including inadequate technical aspects assessment and inadequate institutional set-up. Therefore, it became

apparent that the design and implementation of agricultural projects need a multi-dimensional approach with full involvement of all involved stakeholders, including social scientists, as they are the most suited, even to understanding the informal institutions that can impact positively or negatively on such initiatives.

Research methods that were employed in order to answer the research sub-questions revolved around individual project as a unit of study therefore, emphasis was placed on views, opinions and perceptions that transpired from the individual projects. For exploratory purposes non-participants views, opinions, and perceptions as well as comparisons between non-participants and participants were found. Data presentation and analysis indicated that the project was well designed and implemented as evidenced by the observable effects.

7.2 Needs and aspirations of the rural communities

Reference will be made to the objectives and structure of the Nguni project so that a relationship between them and the needs and aspirations of the rural communities can be established. These needs and aspirations were established through finding patterns and relationships to answers they provided in response to some of the questions from the questionnaires. Certain questions were specific about their needs and aspirations.

The first research question reads as follows: *To what extent were the objectives and structure of the Nguni project tailored in relation to the needs and aspirations of the rural communities?*

The objectives of the Nguni project, as stated in chapter one, imply that re-introduction of the Nguni indigenous cattle breed into the rural areas of the Eastern Cape Province of South Africa was viewed as an important vehicle to uplift the livelihoods of communal people. This was to be achieved through proper implementation of the of the projects' structure (overall plan).

As regarding the management factors that were considered and their compatibility with the needs and aspirations of the rural communities, in relation to the objectives and structure of the project, one was led to arrive at the following conclusions:

- All participants used veld as their feeding source, though there were a few respondents who indicated that they supplemented the veld in the dry season.

Findings indicate that they would all like to supplement their current feed sources. This would be possible through one of the research phases of the structure of the project, where its main aim is to evaluate the impact of a fodder bank on the critical dry period.

- The current state of rangelands indicates that participants aspire to improved rangelands to promote productivity. Though most believed they still practise good rangeland management, their livestock production training needs indicate that they would benefit from a support structure in which extension officers were trained, and seconded to the villages.
- Findings indicate that selection of breeding stock is mainly associated with performance. This implies that an objective of the project, which is to improve the living standards of the rural communities, correlates with their needs to realize improved future income, when the project starts to market its products.
- A question of introducing adequate breeding stock to the rural communities through the "Fort Hare Nguni model" and "return of the gift" points to the fact that the structure of the project considered the needs and aspirations, not only of the current recipients, but also of future recipients.
- Findings indicate that respondents relied on advice from different groups of people, namely: extension officers; experienced farmers; neighbours; drug suppliers and veterinarians. This is good management practice though the level of accuracy of the information cannot be verified. Through the structure of the project, which is to create a support system, correction of some pitfalls, resulting from the dissemination of incorrect information, could be corrected.
- Findings indicate that most of the mortality cases are the result of diseases, which can be significantly reduced through proper implementation of the support system. Secondly, the research part of the project which aimed at evaluating the potential of the Nguni skins and hides in the global market would help, even in cases of dead animals, as long as their skins and hides are in good condition.

Correlation of the objectives and structure of the project with the needs and aspirations of the rural communities, as far as their perceptions, views and opinions were concerned:

- All the participants indicated that the objectives of the project met with their future income needs. This implies that the structure of the project considered their aspirations of making a better living out of the sale of the project products.
- Revelations of the findings that a small portion of the participants had had some form of training in livestock production, and the fact that they indicated that they would like to be provided with training in different areas of livestock production - notably health management (88.5%) - is an indication that the objectives and structure of the project considered the needs and aspirations of the recipients through its support system.
- Findings indicates that health management, calf rearing and breeding management are the highly rated areas where participants prefer to be trained on, it is interesting to note that these areas are directly related to increased productivity which will meet income needs of the participants hence the design of the project catered for such issues by incorporating several institutions such as the Department of Agriculture and University of Fort Hare. Through their technical personnel such training is achievable.
- Findings of the study on problems experienced in running the project, such as the shortages of feed resources, mortality, and poor extension services, indicate the importance of the structure of the project in areas such as evaluating the impact of a fodder bank on the critical dry period, and capacity building (support system).
- Preferences of the participants for livestock intervention, as compared to other forms of intervention, are a clear indication that the objectives and structure of the project were tailored to the needs and aspirations of the rural communities.
- The fact that most of the non-participants indicated lack of time as the main reason why they did not join the project and are comfortable with the existence of the project in their communities, though they would consider joining the project at a later stage implies that they found nothing wrong with the objectives and structure of the project.

The above arguments lead one to conclude that the objectives and the structure of the project were tailored to the needs and aspirations of the rural communities.

7.3 Implementation of the Nguni project and participants' expectations

This section will highlight some of the implementation issues of the project that will help the researcher to find relationships with the participants' expectations.

The second research question reads as follows: *To what extent is the way the Nguni project is being* implemented *in agreement with participants' expectations?*

As stated in chapter one, implementation of the project implies the inclusion of all the stakeholders from the beginning, which is a good implementation approach. Organisation of community meetings was done through local development economic officers, extension officers at local and District level, and the assistant manager of the livestock improvement programme at Dohne research institute. Involvement of youths and community leadership, and communication awareness programmes indicates that implementation of the project was influenced by the notion that the recipients should be the owners of the project hence they should feel being part of the whole implementation process. Therefore, implementation of the project was in agreement with participants' expectations.

As far as management factors were concerned, the project planners and the implementers did not enforce certain management practices that were supposed to be strictly followed by participants. Management practices were therefore predominantly a domain of the participants, though other institutions such as the Provincial Department of Agriculture, through extension officers and the implementers have always been involved in giving advice on preferred livestock production practices. Increased productivity is related to, among other factors, good management practices. However, findings of the performance of the individual projects reveal some problems. There are two projects within all the surveyed projects that performed unsatisfactorily; that is, their current numbers of animals were below the initial numbers. Feed resources were indicated as one of the constraints in running the project properly. Findings reveal that most participants associated this problem with inadequate fencing rather than poor grazing practices. This then implies low involvement of institutions, such Local Municipalities, in rectifying the fencing problem. Findings that advices came from all sectors of the population could also be an indication that visits from the extension officers were not as frequent as they should be. Recipients are hence forced to accept advice from anyone, making it clear

that some of the advice may not be scientifically correct. This could imply low involvement by the Provincial Department of Agriculture. On several monitoring occasions the researcher observed that some of the implementers were giving the recipients advice on livestock production practices that would ensure increased productivity. On some occasions, they have even helped with dosing and vaccinating the animals. This lead one to conclude that implementation process satisfied some of the expectations of the participants.

As far as perceptions, views and opinions of the participants are concerned, in relation to the agreement of implementation of the project with participants' expectations, the following statements can be made:

- Findings indicate that participants were drawn from different societal structures, such traditional leadership, farmers' organizations, and religious and political structures; hence planners of the project emphasized the importance of leadership structures in selling the idea of acceptance of the project by the target population.
- Findings indicate that participants were notified through personal visits by the planners and the implementers about the project, even before it could be introduced in the communities. This implies a good implementation strategy because it usually led to an increased participation by the target population since they easily attached a greater sense of ownership to the project.
- An indication derived from finding that all participants were clearly told about the objectives of the project before they started participating, points to implementation practices that were meant to satisfy participants because their expectations would be to join an initiative that they clearly understand its objectives. However, it appeared as if some of the participants did not clearly understand the objectives of the project, as they indicated that they would even like to see the project designers giving them seeds and tractors so as to plant fodder for the animals in the dry season. This is clearly not part of the objectives of the project.
- Findings indicate that minority of participants would have preferred individual ownership of the project. This implies that most of the participants were satisfied with the implementation structure of the project in its current form.

- Findings indicate that participants and non-participants all had access to the project bulls. Some participants and non-participants indicated they had received some form of advice from the projects' implementers relating to livestock production. This is an implication of implementation which is in agreement with recipients expectations.
- Conclusions drawn from findings that working relationships between participants and non-participants are good, imply that implementation procedures of the project succeeded in minimizing confrontations between the participants and non-participants.

The conclusion that can be drawn from the above statements is that, though there were individual projects that did not perform satisfactorily; their unsatisfactory performance is largely due to the institutional set-up rather than implementation procedures of the project. Therefore, one can conclude that the Nguni project is being implemented in agreement with participants' expectations.

7.4 Observable effects

This section will highlight some of the observable effects that resulted as a result of introducing the Nguni livestock development project in the Eastern Cape Province of South Africa. This will be achieved through evaluating technical parameters as well as the institutionnal set-up that infuenced the performance of the project.

The third research question reads as follows: *What are the observable effects of the Nguni project?*

Gittinger (1978) defined a project as an activity which requires investment of money in expectation of returns on the investment, and which requires planning, financing and implementation as a unit. An evaluation of observable effects would lead one to expect them to be in the form of returns on the investment carried out. The returns can take the form of either negative or positive results.

Consideration of findings indicate that the design and implementation of the project were all inclusive, in the sense that no sector of the target population was discriminated against. The all-inclusiveness of the project's design and implementation is attributed to a number of factors including the following:

- Technical efficiency- the designers and implementers chose proper means of agricultural service delivery that led to better opportunities in cost effectiveness. Thus, the "Fort Hare model" which is at least five times more cost effective than conventional "bull schemes" has proved successful, therefore one can conclude that technical efficiency was a critical part of this success, if one can measure success through the acceptance level of the project and its performance.
- As indicated by the planners and implementers of the project, the success of the project was partly tied to the involvement of the stakeholders, especially the traditional leadership. Informal institutions played a significant part in the acceptance of the project, hence traditional leadership together with the deployment of social science research methods such as emphasis on understanding the behavioural and socio-cultural variables of the target population resulted in visibly high levels of acceptance.
- As far as management factors that were considered in this study, findings indicate that recipients accept livestock production advice from all sectors of the society. This may not be a good approach to livestock production practices, as evidenced by aspects such as their belief that they still practise good grazing methods, and other considered variables. However, this may be as a result of the unavailability of, or infrequent visits by extension officers to the recipients. This implies that formal institutions such the Provincial Department of Agriculture and Academic institutions should play an increased role in this context.
- Findings of problems in running the project revealed perceived perceptions by the recipients, such as the notion that adequate fencing would help to solve the problem of rangelands. This is a clear indication that other institutions, such District and local Municipalities, are not fully involved, because their full involvement with the rural communities would easily solve the problem of inadequate fencing.
- Other pronounced visible effects of the project are the increasing number of Nguni offspring in the rural communities through the provision of breeding stock.

- Other indicators, such as the high level of enthusiasm among participants towards receiving livestock production training, can be viewed as visible effects of the project.
- Comparisons between participants and non-participants on the selected variables indicate that there are slight differences between the two groups on issues such as causes of grazing conditions and problems within grazing areas, whereas other variables indicated a lot of similarities.

The conclusion that can be drawn from the above statements is that, though the Nguni project has not started to sell its products there are a number of positive observable effects such as the increasing number of Nguni cattle offspring which is a good indication of its start.

7.5 Overall conclusions and recommendations for further research

This section will dwell on findings derived from the whole of chapter 7. The purpose of this exercise is to give clear summary of all the findings.

The main conclusion that was drawn from the first section is that the introduction of the project has had a positive effect on the intended recipients on issues ranging from livestock production perceptions of the recipients to resulting in positive effects in the lives of recipients. This is an implication that the project was well designed and implemented, though it was found out that its performance suffered from some problems that can be corrected through proper involvement of the institutions involved.

The second section led to the conclusion that the objectives and the structure of the project were indeed tailored to the needs and aspirations of the rural communities.

The conclusion that can be drawn from section three is that correct institutional set-up is a prerequisite for success of projects such as the Nguni project. Therefore planners and implementers should consider both technical and institutional aspects before implementing a project. Findings indicated that individual projects that did not perform satisfactorily; their unsatisfactory performance is largely due to the institutional set-up rather than implementation procedures of the project. Therefore, a conclusion that the Nguni project is being implemented in agreement with participants' expectations can be made.

The conclusion that can be done from section four is that, there are a number of positive observable effects if one considers the increasing number of Nguni cattle offspring and the level of enthusiasm concerning the project within the recipients.

Overall findings indicated that there is still a need for further research on areas such as tick infestation of the animals because observations that showed infestations on other animals though, it is indicated that dipping is done correctly raises questions of whether performance of the individual projects are not being hampered by ticks. Another area that needs further research is the sustainability of the project, this is a concern because the project has not started to sell its products so it is unknown whether when it starts to sell its products it will continue with what the findings indicated or it will change its direction for the worst.

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APPENDIX A

Research and publications on Nguni cattle

University of Fort Hare[1]

Academic qualifications (Theses and Dissertations)

1. V. Muchenje: PhD Thesis (Completed 2007) Growth Performance, Carcass Characteristics and Meat Quality of Nguni, Bonsmara and Angus Raised on Natural Pasture.

2. T. Ndlovu: MSc Thesis (Completed) Blood metabolites and internal parasites in Nguni, Bonsmara and Angus steers.

3. C. Mapiye: PhD Thesis (In progress) Nguni cattle production in communal areas.

4. C. M. Marufu: MSc Thesis (Completed 2008) Nguni cattle tickloads and seroprevalence in communal areas.

5. N. Nqeno: MSc Thesis (Completed 2008) Nguni cattle reproductive performance in communal areas.

6. L. Musemwa: MSc Thesis (Completed 2008) Nguni cattle marketing in communal areas.

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2. Muchenje, V., Dzama, K., Chimonyo, M., Strydom, P. E., and Raats, J. G., (2009). Relationship between stress responsiveness and meat quality in three cattle breeds. Meat Science: 81: 653-657.

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[1] *Source*: The information was provided by researchers based in the *School of Agriculture and Agribusiness* in the *Faculty of Science and Agriculture* at the University of Fort Hare, following a request for such information by this researcher (April 2009).

6. Muchenje, V., Dzama, K., Chimonyo, M., Strydom, P. E., Hugo, A., and Raats, J. G., (2008). Sensory evaluation and its relationship with physical meat characteristics of beef from Nguni and Bonsmara steers raised on natural pasture. Animal 2: 1700-1706.

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8. Muchenje, V., Hugo, A., Dzama, K., Chimonyo, M., Raats, J. G., and Strydom, P. E., (2008). Cholesterol levels and fatty acid profiles of meat from Nguni, Bonsmara and Angus steers raised on natural pasture. Journal of Food Composition and Analysis (Accepted/ In Press).

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10. Jama, N., Muchenje, V., Chimonyo, M., Strydom, P. E. Dzama, K., and Raats, J. G., (2008). Cooking loss components of beef from Nguni, Bonsmara and Angus steers raised in a low input cattle production system on natural pasture. African Journal of Agricultural Research 3: 416-420.

11. Ndlovu, T., Chimonyo, M., Okoh, A. I., and Muchenje, V., (2008). Effect of breed on stress hormones at slaughter in Angus, Nguni and Bonsmara steers. African Journal of Agricultural Research 3: 96-100.

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13. Mapiye, C., Chimonyo, M., Muchenje, V., Dzama, K., Dzama, K., and Raats, J. G., (2007). Potential for value-addition of Nguni cattle products in the communal areas of South Africa: A review. African Journal of Agricultural Research 2 (10): 488-495.

14. Ndlovu, T., Chimonyo, M., Okoh, A. I., Muchenje, V., Dzama, K., and Raats, J. G., (2007). Assessing the nutritional status of beef cattle: Current practices and future prospects. African Journal of Biotechnology 6 (24): 2727-2734.

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the 54th International Congress of meat Science and Technology held in Cape Town, South Africa from the 10th to the 15th August 2008.

2. Muchenje, V., Dzama, K., Chimonyo, M., Raats, J. G., Strydom, P. E., Ndlovu, T., Pepe, D., Sibanga, M. W., Nyanga, M., and Mhanga, F., (2007). Histological and physical attributes of meat of Nguni, Bonsmara and Angus steers raised on veld. In the Proceedings of the 53rd International Congress of Meat Science and Technology held in Beijing, China from 5th to the 10th August 2007.

3. Muchenje, V., Dzama, K., Chimonyo, M., Muchenje, V., Dzama, K., Strydom, P. E., Hugo, A., and Ndlovu, T., (2007). Fatty acid profiles of longissimus thoracis et lumborum of Nguni, Bonsmara and Angus steers raised on veld. In Proceedings of the 53rd International Congress on Meat Science and Technology held in Beijing, China from 5th to the 10th August 2007.

4. Molai, T., Muchenje, V., Dzama, K., and Dube, B., (2007). An evaluation of the reproductive performance of the Nguni cows at the University of Fort Hare Research Farm in the Easter Cape, South Africa. A poster presented at the 8th Research Council of Zimbabwe Symposium in Harare from 31 January to 2 February 2007.

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6. Muchenje, V., Dzama, K., Raats, J. G., Chimonyo, M., Dube, B., Nkukwana, T., and Tshaka, S., (2006). Potential use of diatomite in tick control in beef cattle. Presented at the 41st SASAS Congress held from 3rd to the 6th April 2006 in Bloemfontein, South Africa.

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1. Muchenje, V., Dzama, K., Chimonyo, M., Strydom, P. E., Ndlovu, T., and Raats, J. G., (2008). The Nguni: From the breed of the past to high beef quality under tough conditions.

2. Muchenje, V., Dzama, K., Chimonyo, M., Strydom, P. E., Raats, J. G., and Ndlovu, T., (2008). The Bonsmara: Desirable attributes from the "farm to mouth". Bonsmara SA.

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1. Mapiye, C., Chimonyo, M., Dzama, K., Marufu, M.C., and Muchenje, V. Growth, blood chemistry and carcass characteristics of Nguni steers supplemented with Acacia karro leaf-meal. (Under first review: Animal Feed Science and Technology).

2. Mapiye, C., Chimonyo, M., Dzama, K., and Muchenje, V. Meat quality of the Nguni steers supplemented with Acacia karro leaf-meal. (Under first review: Meat Science).

APPENDIX B

Questionnaire for participants

Interviewer……..
Respondent number…….
Date...……...

Demographic Aspects

1. Gender of respondent
a. 1.Male……2.Female…….

b. Marital status 1.Married….. 2.Single….. 3.Divorced…….. 4.Widowed……

c. 1.Age< 20…..2.20-35…… 3.36-45……4.46-55 ……5.>55…….

d. Highest level of education 1.No schooling…… 2.Grade 7……. 3.Grade 12……
4.Tertiary…

2. Employment status.

Nil	1.
Agriculture	2.
Commerce	3.
Industry	4.
Mining	5.
Civil service	6.
Other (specify)	7.

3. Which land tenure is used for the project animals grazing?

Communal	1.
Traditional authority	2.
State land	3.
Other (specify)	4.

Cattle feeding aspects

1. What type of feeding system do you use?
1.Herding…. 2.Paddock….. 3.Stalling…… 4.Yard…… 5.Free grazing……
6.Combinations…….. 7.Other (specify)……

2. What are the sources of feed for your cattle? (Tick 1 or more) 1.Veld……..
2.Pasture……. 3.Conserved feed……. 4Crop residues…… 5.Bought-in feed……
6.Combinations…….. 7.Other (specify)……

3. Do you provide supplementary feeding to your cattle? 1.Yes …… 2.No…

4. If yes to question 3, when do you provide supplements to your cattle?

Emergency times	1.
Dry season	2.
Winter	3.
Throughout the year	4.
Other (specify)	5.

5. What type of supplements do you provide to your cattle? (Tick one or more)

Protein	1.
Energy/Roughage	2.
Minerals/Vitamins	3.
Other (specify)	4.

6. Which class of cattle do you give supplements and why?

Class	Tick	Reason
Calves		1.
Heifers		2.
Steers		3.
Cows		4.
Oxen		5.
Bulls		6.

7 Assessment of grazing conditions over the past 5 years.

Deteriorating-very poor conditions little grass	1.
Deteriorating-poor conditions but some grass	2.
Fair-reasonable grass	3.
Good-plenty of grass	4.
Very good-improving	5.

8 What could have led to the current state of rangelands? (Tick one or more)

Poor grazing practices	1.
Poor soils	2.
Low rainfall	3.
Good rainfall	4.
Bush encroachment	5.
Veld fires	6.
Other (specify)	7.

9. What problems do you face in the management of grazing areas?

No/Bad fencing	1.
Inadequate water provision	2.
Veld fires	3.
Bush encroachment	4.
Not enough grazing area	5.
Other (specify)	6.
No problem	7.

10. What do you think can be done to improve the grazing area?

Erection of fence	1.
Provision of water	2.
Good grazing management	3.
Other (specify)	4.

11. Where do your animals get water?

Dams	1.
Streams	2.
Other (specify)	3.

12. How far is this from where the cattle stay? 1. Nearby……2. Far away…..

13. What is the general body condition of your animals during the following periods of the year?

1.Excellent	Spring
2.Good	Summer
3.Poor	Autumn
4.Very poor	Winter

14. How has the condition changed over the past 12 months?

Improved	1.
No change	2.
Deteriorating	3.

15. If the condition has changed, what are the causes?

Poor grazing	1.
Diseases	2.
Lack of water	3.
Other (specify)	4.

Breeding Aspects

1. What breeds do you have?

2. How do you mate your cattle?

Uncontrolled	1.
Group mating	2.
Artificial insemination	3.
Other (specify)	4.

3. What are the sources of cattle used for breeding?

Source	Animals
1.Locally bred	
2.Bought	
3.Donated	
4.Borrowed	
5.Other (specify)	

4. What factors do you consider when selecting breeding stock? (Rank 1-3 as the most important reason)

Reason	Cattle	
	Tick	Rank
1.Performance		
2.Conformation		
3.Body condition		
4.Health		
5.Old age		
6.Temperament		
7.Others (specify)		

5. Do you have problems of bull fertility? 1.Yes…… 2.No…

6. If yes, what are they? 1. Not enough….2. Other……

7. Cattle identification.

By names	1.
Tags	2.
Brand	3.
Other (specify)	4.

8. Do you castrate your male calves? 1.Yes……. 2.No……

9. If yes to question 8, what are your reasons? (Tick one or more)

To control breeding	1.
Meat quality improvement	2.
Get rid of unwanted traits	3.
Other (specify)	4.

10. At what age do you normally castrate male cattle?

Less than a week	1.
After two weeks	2.
After a month	3.
After three months	4.
Other (specify)	5.

11. Do you have a problem of late calving? 1.Yes…….. 2.No…

12. If yes to question 11, what are the reasons? (Rank 1-3 as the most important)

Reason	Rank
1.Nutrition	
2.Disease	
3.Inadequate bulls	
4.Breed	
5.Other(specify)	

13. On average, what is the calving interval of your cows?

One year	1.
Two years	2.
Three years	3.
Other (specify)	4.

14. Do you experience miscarriage problems with your cows? 1.Yes…… 2.No…

15. If yes to question 14, what are the causes?

Causes	Tick
Nutrition	1.
Age	2.
Diseases	3.
Other (specify)	4.

16. When do most of your cows calve down?

Rainy season	1.
Dry season	2.
Summer	3.
Winter	4.
Throughout the year	5.

17. Do you experience calving problems? 1.Yes……. 2.No…

18. What is the average length of lactation period for your cows?

Less than six months	1.
Between six and 12 months	2.
Between 12 and 18 months	3.
More than 18 months	4.

19. At what age do you wean your calves?

Less than three months	1.
Between three and six months	2.
Between six and nine months	3.
Between nine and 12 months	4.
After 12 months	5.
Weans itself	6.

20. What method do you use to wean your calves?

Natural weaning	1.
Separation	2.
Attaching a metal plate to the nostrils	3.
Other (specify)	4.

21. What are the chances of calf survival to weaning stage?

Excellent	1.
High	2.
Moderate	3.
Low	4.

22. Do you dehorn your calves? 1.Yes…… 2.No…….

23. What type of housing do you use for your calves?

Kraal	1.
Stall	2.
Other (specify)	3.
No housing	4.

24. What types of materials have been used for calf housing? (Tick one or more)

Iron sheets/asbestos	1.
Fence	2.
Stones	3.
Untreated wood	4.
Other (specify0	5.

25. At what time do you release your calves to meet their mothers?

Between 0600-0800hrs	1.
Between 0800-1000hrs	2.
Between 1000-1200hrs	3.
After 1200hrs	4.
Always with them	5.

Health aspects

1. If your animals get sick, whose advice do you seek? (Tick on or more)

Extension workers	1.
Experienced farmer	2.
Veterinary	3.
Neighbours	4.
Drug suppliers	5.
Other (specify)	6.
Animals never sick	7.
Animals never sick	8.
Nothing	9.

2. If you treat your animals, what type of medicine do you use?

Commercial	1.
Traditional	2.
Other (specify)	3.

3. What are the major causes of mortality of your cattle? (Tick one or more)

Diseases	1.
Poor diet	2.
Lack of water	3.
Extreme weather conditions	4.
Predators	5.
Other (specify)	6.

4. If you dip your animals, how often do you dip them?

Once per week	1.
Once per two weeks	2.
Once per moth	3.
Other (specify)	4.
Never	5.

5. How do you dip your animals?

Plunge	1.
Spray	2.
Pour on	3.
Other (specify)	4.

6. How do you control internal parasites?

Dosing	1.
Vaccination	2.
Other (specify)	3.
Never	4.

7. Do you conduct post-mortems on your dead animals? 1.Yes…… 2.No….

8. If yes to question 12, how do you do it? 1.Myself…….2.With professional help…

9. How do you dispose of dead animals?

Bury	1.
Burn	2.
Leave it there	3.
Eat	4.
Other (specify)	5.

10. What are the most prevalent diseases and parasites in your area? (Rank 1 as the most common)

Diseases	**Rank**
1.Red water	
2.B.quater	
3.Foot rot	
4.L.skin	
5.Gall sick	
Parasites	**Rank**
1.ticks	
2.Round.w	
3.Tape.w	
4.Other	

11. If you vaccinate your cattle, which diseases do you vaccinate against?……

12. What are the most common cattle predators in your area if any?
1.Jackals….2.Wild cats…..3.People……4.Other……..

Personal

1. Are you in a leadership position in your community? 1.Yes…… 2.No……

2. If the yes to question 1, in which position? Tick appropriate row/rows.

Political party	1.
Religious organisation	2.
Local traditional leadership	3.
Local farmers' organisation	4.
Local co-operative	5.
Other (specify)	6.

3. Are any of your best three friends in some sort of a leadership position? 1.Yes.. 2.No…

4. What kind of people do consider as your role models?

Innovators	1.
Followers	2.
Other (specify)	3.

5. Were the local people notified about the project before it started? 1.Yes….. 2.No…….

6. If yes to the above question, when were they notified? 1.one month…..2.three months….3.six months…4.twelve months …5.two year…

7. If yes to question 1, how were they informed?

Personal visit	1.
Radio	2.
Television	3.
Pamphlets/newspaper	4.
Other (specify)	5.

8. If yes to question 1, were the objectives of the projects spelled out clearly? 1.Yes ....2.No …….

9. Were the local people allowed to participate in the planning process? 1.Yes… 2.No…

10. If yes to question 5, was the participation gender balanced? Yes… No….

11. If no, can you explain ?.....

12. Did the objectives of the project suit your needs and aspirations?

Yes	1.
No	2.
Not sure	3.

13. If yes to question 8, how were they compatible with your needs and aspirations?

Needs and aspirations	Tick
1.Source of income	
2.Prestige	
3.Cultural purposes	
4.Other (specify)	

14. When did you decide to participate in the Nguni Project? 1. inception….2.After……

15. Did the promised livestock arrive on time? 1.Yes…. 2.No….

16. If yes to question 11, were they in good conditions? 1.Yes……. 2.No…. (conditions)

17. If no to question 11, what could have been the reason?

Good	1.
Mediocre animals	2.
Stress	3.

18. Who is/are responsible for daily operational activities of the project?

Project manager	1.
Hired labour	2.
Community members	3.
Other (specify)	4.

19. Have you been trained in livestock production? 1.Yes…… 2.No……

20. If yes to question 15, who trained you? (Tick appropriate row/rows).

Extension worker	1.
Agricultural specialist	2.
Experienced farmer	3.
Other (specify)	4.

21. If you need training, which areas do you require training? (Rank 1-3 as the most important)

Area	Rank
1.Feeding management	
2.Breeding management	
3.Calf rearing	
4.Rangeland management	
5.Marketing management	
6.Record keeping	
7.Health management	
8.Other (specify)	

22. Have you experienced problems in running the project? (Rank, 1 is the most important)

Problems	Rank
1.Shortage of feed resources	
2.High mortality	
3.Lack of suitable breeding stock	
4.Lack of control of parasites and disease	
5.Lack rangeland management	
6.Lack of organized markets	
7.Lack appropriate skills for livestock production	
8.Poor extension	
9.Veterinary services	
10.Institutional support	
11.Lack of infrastructural	
12.Stock theft	
13.Other (specify)	

23. Which one of the following organisation do you belong to?

Co-operative	1.
Local farmer's organisation	2.
Political party	3.
Religious organisation	4.
Other (specify)	5.

24. Are other people who would like to join the project at the later stage allowed to do so? 1.Yes….. 2.No……

25. If yes to question 19, what criteria is used?.....

26. How are the working relationships between the participants and non-participants since the introduction of the project?.....

27. Would you have preferred an individual ownership of the livestock if the project would have made that possible? 1.Yes….. 2.No…..

28. Which interventions would you prefer most to see in your village? (Rank 1 as the most important).

Intervention	Rank
1.Crops	
2.Livestock	
3.Crops and livestock	
4.Other (specify)	

29. Do you have access to Nguni project bulls? 1.Yes……. 2.No…….

30. If yes to question 14, when did you start using bulls from the Nguni project? 1. Inception….. 2. After inception……

31. What other support do you get from the Nguni cattle project? 1. Bulls….. 2. Heifers…. 3. Advice…….4. Other (specify)……

32. Are all the community members willing to participate in the Nguni project? 1.Yes….. 2.No…

33. If you need more support from the Nguni project, what type of support do you require?

Infrastructure	1.
Bulls	2.
Heifers	3.
Veterinary services	4.
Advice	5.
Capacity building	6.
Other (specify)	7.

APPENDIX C

Questionnaire for non-participants

Interviewer……..
Respondent number……..
Date...……...

Demographic Aspects

1. Gender of respondent
a. 1.Male……2.Female……

b. Marital status 1.Married….. 2.Single….. 3.Divorced…….. 4.Widowed……

c. 1.Age< 20…..2.20-35…… 3.36-45……4.46-55 ……5.>55…….

d. Highest level of education 1.No schooling…… 2.Grade 7……. 3.Grade 12……
4.Tertiary……

2. Employment status.

Nil	1
Agriculture	2
Commerce	3
Industry	4
Mining	5
Civil service	6
Other (specify)	7

3. Which land tenure is used for the project animals grazing?

Communal	1
Traditional authority	2
State land	3
Other (specify)	4

Cattle feeding aspects

1. What type of feeding system do you use?
1.Herding…. 2.Paddock….. 3.Stalling…… 4.Yard…… 5.Free grazing……
6.Combinations…….. 7.Other (specify)……

2. What are the sources of feed for your cattle? (Tick 1 or more) 1.Veld……..
2.Pasture……. 3.Conserved feed……. 4Crop residues…… 5.Bought-in feed……
6.Combinations…….. 7.Other (specify)……

3. Do you provide supplementary feeding to your cattle? 1.Yes …… 2.No…

4. If yes to question 3, when do you provide supplements to your cattle?

Emergency times	1
Dry season	2
Winter	3
Throughout the year	4
Other (specify)	5

5. What type of supplements do you provide to your cattle? (Tick one or more)

Protein	1
Energy/Roughage	2
Minerals/Vitamins	3
Other (specify)	4

6. Which class of cattle do you give supplements and why?

Class	Tick	Reason
Calves		1
Heifers		2
Steers		3
Cows		4
Oxen		5
Bulls		6

7 Assessment of grazing conditions over the past 5 years.

Deteriorating-very poor conditions little grass	1
Deteriorating-poor conditions but some grass	2
Fair-reasonable grass	3
Good-plenty of grass	4
Very good-improving	5

8 What could have led to the current state of rangelands? (Tick one or more)

Poor grazing practices	1
Poor soils	2
Low rainfall	3
Good rainfall	4
Bush encroachment	5
Veld fires	6
Other (specify)	7.

9. What problems do you face in the management of grazing areas?

No/Bad fencing	1
Inadequate water provision	2
Veld fires	3
Bush encroachment	4
Not enough grazing area	5
Other (specify)	6
No problem	7

10. What do you think can be done to improve the grazing area?

Erection of fence	1
Provision of water	2
Good grazing management	3
Other (specify)	4

11. Where do your animals get water?

Dams	1
Streams	2
Other (specify)	3

12. How far is this from where the cattle stay? 1. Nearby……2. Far away…..

13. What is the general body condition of your animals during the following periods of the year?

Excellent	1	Spring
Good	2	Summer
Poor	3	Autumn
Very poor	4	Winter

14. How has the condition changed over the past 12 months?

Improved	1
No change	2
Deteriorating	3

15. If the condition has changed, what are the causes?

Poor grazing	1
Diseases	2
Lack of water	3
Other (specify)	4

Breeding Aspects

1. How do you mate your cattle?

Uncontrolled	1.
Group mating	2.
Artificial insemination	3.
Other (specify)	4.

2. What are the sources of cattle used for breeding?

Source	Animals
1.Locally bred	
2.Bought	
3.Donated	
4.Borrowed	
5.Other (specify)	

3. What factors do you consider when selecting breeding stock? (Rank 1 as the most important reason)

Reason	Cattle	
	Tick	Rank
1.Performance		
2.Conformation		
3.Body condition		
4.Health		
5.Old age		
6.Temperament		
7.Others (specify)		

4. Do you have problems of bull fertility? 1.Yes…… 2.No……

5. If yes, what are they? 1. 1. Not enough….2. Other…

5. Cattle identification.

By names	1.
Tags	2.
Brand	3.
Other (specify)	4.

6. Do you castrate your male calves? 1.Yes……. 2.No……

7. If yes to question 9, what are your reasons? (Tick one or more)

To control breeding	1.
Meat quality improvement	2.
Get rid of unwanted traits	3.
Other (specify)	4.

8. At what age do you normally castrate male cattle?

Less than a week	1.
After two weeks	2.
After a month	3.
After three months	4.
Other (specify)	5.

9. Do you have a problem of late calving? 1.Yes…….. 2.No……

10. If yes to question 20, what are the reasons? (Rank 1 as the most important)

Reason	Rank
1.Nutrition	
2.Disease	
3.Inadequate bulls	
4.Breed	
5.Other(specify)	

11. On average, what is the calving interval of your cows?

One year	1.
Two years	2.
Three years	3.
Other (specify)	4.

12. Do you experience miscarriage problems with your cows? 1.Yes…… 2.No……

13. If yes to question 21, what are the causes?

Causes	Tick
Nutrition	1.
Age	2.
Diseases	3.
Other (specify)	4.

14. When do most of your cows calve down?

Rainy season	1.
Dry season	2.
Summer	3.
Winter	4.
Throughout the year	5.

15. Do you experience calving problems? 1.Yes……. 2.No……

16. What is the average length of lactation period for your cows?

Less than six months	1.
Between six and 12 months	2.
Between 12 and 18 months	3.
More than 18 months	4.

17. At what age do you wean your calves?

Less than three months	1.
Between three and six months	2.
Between six and nine months	3.
Between nine and 12 months	4.
After 12 months	5.
Weans itself	6

18. What method do you use to wean your calves?

Natural weaning	1.
Separation	2.
Attaching a metal plate to the nostrils	3.
Other (specify)	4.

19. What are the chances of calf survival to weaning stage?

Excellent	1.
High	2.
Moderate	3.
Low	4.

20. Do you dehorn your calves? 1.Yes…… 2.No…….

21. What type of housing do you use for your calves?

Kraal	1.
Stall	2.
Other (specify)	3.
No housing	4.

22. What types of materials have been used for calf housing? (Tick one or more)

Iron sheets/asbestos	1.
Fence	2.
Stones	3.
Untreated wood	4.
Other (specify0	5.

23. At what time do you release your calves to meet their mothers?

Between 0600-0800hrs	1.
Between 0800-1000hrs	2.
Between 1000-1200hrs	3.
After 1200hrs	4.
Always with them	5.

Health aspects

1. If your animals get sick, whose advices do you seek? (Tick on or more)

Extension workers	1.
Experienced farmer	2.
Veterinary	3.
Neighbours	4.
Drug suppliers	5.
Other (specify)	6.
Animals never sick	7.
Animals never sick	8.
Nothing	9.

2. If you treat your animals, what type of medicine do you use?

Commercial	1.
Traditional	2.
Other (specify)	3.

3. What are the major causes of mortality of your cattle? (Tick one or more)

Diseases	1.
Poor diet	2.
Lack of water	3.
Extreme weather conditions	4.
Predators	5.
Other (specify)	6.

4. How often do you dip your animals?

Once per week	1.
Once per two weeks	2.
Once per moth	3.
Other (specify)	4.
Never	5.

5. How do you dip your animals?

Plunge	1.
Spray	2.
Pour on	3.
Other (specify)	4.

6. How do you control internal parasites?

Dosing	1.
Vaccination	2.
Other (specify)	3.
Never	4.

7. Do you conduct post-mortems on your dead animals? 1.Yes…… 2.No….

8. If yes to question 7, how do you do it? 1.Myself…….2.With professional help

9. How do you dispose of dead animals?

Bury	1.
Burn	2.
Leave it there	3.
Eat	4.
Other (specify)	5.

10. What are the most prevalent diseases and parasites in your area? (Rank 1 as the most common)

Diseases	Rank
1.Red water	
2.B.quater	
3.Foot rot	
4.L.skin	
5.Gall sick	
Parasites	
1.ticks	
2.Round.w	
3.Tape.w	
4.Other	

11. If you vaccinate your cattle, which diseases do you vaccinate against?……

12. What are the most common cattle predators in your area if any?
1.Jackals….2.Wild cats…..3.People……4.Other……..

Personal

1. Are you in a leadership position in your community? 1.Yes…… 2.No……

2. If the yes to question 1, in which position? Tick appropriate row/rows.

Political party	1.
Religious organisation	2.
Local traditional leadership	3.
Local farmers' organisation	4.
Local co-operative	5.
Other (specify)	6.

3. Are any of your best three friends in some sort of a leadership position? 1.Yes..
2.No…

4. What kind of people do consider as your role models?

Innovators	1.
Followers	2.
Other (specify)	3.

5. Were you informed about the project before it started? 1.Yes….. 2.No…….

6. If yes to question 1, how were you informed?

Personal visit	1.
Radio	2.
Television	3.
Pamphlets/newspaper	4.
Other (specify)	5.

7. If no to question, how did you come to know about the project if you now know about it?

Word of mouth	1.
Radio	2.
Television	3.
Pamphlets/newspaper	4.
Other (specify)	5.

8. Why have you not joined the project?

Do not have time	1.
Do not have joining fee	2.
Strict joining rules	3.
It would be useless	4.
Other (specify)	5.

9. Having known about the project, would you consider joining? 1.Yes…… 1.No…..

10. If yes to question 5, can you explain?

Would be source of income	1.
Prestige	2.
Would serve other cultural needs	3.
Other (specify)	4.

11. Which interventions would you prefer most to see in your village? (Rank 1 as the most important).

Intervention	Rank
1.Crops	
2.Livestock	
3.Crops and livestock	
4.Other (specify)	

12. Are you comfortable with the project? 1.Yes…… 2.No…….

13. If no to question 8, why?

It degrades pastures	1.
Livestock destroys our crops	2.
Breeding with our livestock	3.
Other (specify)	4.

14. If yes to question 8, why?

Increase living standards of people	1.
Creates respectability for the village	2.
Other (specify)	3.

15. Do you get any support from the project? 1.Yes…. No…….

16. If yes to question 11, what type of support?

Bull service	1.
Advisory service	2.
Other (specify)	3.

17. What kind of improvement would you like to see at the project?.....

More bulls	1.
More heifers	2.
Supplementary feeding	3.
Fencing and dipping facilities	4.
Adequate water provision	5.
Others	6.

18. Do you have problems of low bull numbers? 1.Yes….. 2.No ……

19. Do you have access to Nguni project bulls? 1.Yes……. 2.No……..

20. If yes to question 13, when did you start using bulls from the Nguni project? 1. Inception….. 2. After introduction……

21. What other support do you get from the Nguni cattle project? 1. Bulls….. 2. Heifers…. 3. Advice……. 4. Other (specify)……

22. Are all the community members willing to participate in the Nguni project? 1.Yes….. 2.No…

23. If you need more support from the Nguni project, what type of support do you require?

Infrastructure	1
Bulls	2
Heifers	3
Veterinary services	4
Advice	5
Capacity building	6
Other (specify)	7

4.5 The research component of the Nguni project

As indicated in Chapter 1 it was envisaged that the Nguni project would have a research component. This research would be aimed at assessing the adaptability of Nguni cattle in rural communities, the potential for producing organic meat for export markets, and market research covering the market acceptability of organically produced meat.

A number of research projects based on or involving the Nguni project have been conducted by academic staff members and postgraduate students at the University of Fort Hare (some of these in collaboration with "outside" researchers. Most of these have been based in the Department of Livestock and Pasture Science at Fort Hare University. The research projects (some already completed, some still in progress) are listed in Appendix A. The information was provided by researchers based in the *School of Agriculture and Agribusiness* in the *Faculty of Science and Agriculture* at the University of Fort Hare, following a request for such information by this researcher (April 2009).

As indicated in Appendix A one research project at PhD level (focusing on meat science) was completed in 2007, while another PhD research project (focusing animal welfare and meat science) is still in progress. Four MSc Agric research projects have been completed, one of which focused on marketing of the Nguni cattle while three focused on meat science.

The Nguni project has resulted in 15 published papers in refereed journals, and six peer-reviewed conference/symposium papers of which four were presented outside South Africa. The list of research outputs also includes two non-reviewed popular publications focusing on general animal science, while two papers have been submitted to peer-refereed journals.

From this information it is clear that the Nguni project has formed the basis of a substantial number of high-level scholarly research projects. Most of the projects have been in meat science or other "technical" aspect of Nguni cattle. Only one project has considered marketing of Nguni cattle, while the aim of undertaking market research to establish the potential for a niche market for organically produced Nguni meat has not yet been achieved.