AN OVERVIEW OF THE MANAGEMENT PRACTICES FOR WOOL PRODUCTION AMONGST THE COMMUNAL FARMERS OF THE HEWU DISTRICT IN THE EASTERN CAPE PROVINCE

BY

MBULELO JOSEPH MAKAPELA

Submitted in fulfillment/partial fulfillment of the requirements for the degree

M Tech in Agri Business Management

NELSON MANDELA METROPOLITAN UNIVERSITY

PORT ELIZABETH, SOUTH AFRICA

DECEMBER 2008

PROMOTER : DR AC GEYER

CO-PROMOTER : MR WR VAN HEERDEN

DEPARTMENT OF ACADEMIC ADMINISTRATION
EXAMINATION SECTION
SUMMERSTARND NORTH CAMPUS
PO Box 77000
Nelson Mandela Metropolitan University
Port Elizabeth
6013

Enquiries: Postgraduate Examination Officer

Nelson Mandela Metropolitan University
for tomorrow

DECLARATION BY CANDIDATE

NAME: **Mbulelo Joseph Makapela**

STUDENT NUMBER: **9929015**

QUALIFICATION: **M Tech (Agriculture)**

TITLE OF PROJECT:

An overview of the management practices for wool production amongst the communal farmers of the Hewu district in the Eastern Cape Province

DECLARATION:

In accordance with Rule G4.6.3, I hereby declare that the above-mentioned treatise/ dissertation/ thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification.

SIGNATURE: _____

DATE: _____

ACKNOWLEDGEMENTS

Quite a number of people have made important contributions in many ways through the duration of this research project. However, I would like to thank the following people in particular:

The Almighty God, who gave me the courage and strength to complete this project.

- My ancestors for their support
- My promoter, Dr A C Geyer, for his encouragement and valuable input.
- My co-promoter, Mr W R van Heerden, for his encouragement and contributions.
- Mrs M Bezuidenhout, for her valuable input.
- The extension officers from the Department of Agriculture, for their support.
- My wife, parents, children and friends, who are a great inspiration in my life and who carried me through this project with prayers, encouragement and enthusiasm.
- The Land Bank for the financial assistance.
- The personnel of the National CMW and National Wool Growers Association for their friendly assistance.
- All the farmers of the Hewu district who were involved with the collection of the data. Thank you for your co-operation and interest. Without your involvement this project would have been impossible.

I hereby declare that this project which is hereby handed in for the M Tech Agriculture degree at the Nelson Mandela Metropolitan University by me, has never before been handed in by myself for another degree at any other university.

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ABSTRACT

The research was conducted in the Hewu area situated between Queenstown (20 km) and Whittlesea (15km) in the Eastern Cape Province of South Africa. In this area communal farming is practiced. Livestock and livestock products (wool) are the main sources of income. The farmers are mainly farming with Merino and Döhne Merino sheep.

The lack of management systems (production, reproduction and management) for communal farmers resulted into ineffective communal farming defining the research problem. The research objectives set were:

- To establish production norms for wool sheep.
- To establish reproduction norms for wool sheep.
- To establish effective management practices for wool sheep farmers.
- To examine key constraints of wool sheep farmers.

The farmers shear their sheep every 12 months usually in October of every year. The average wool production per sheep is 2.17kg. The clip averages a fineness of 19.1-20 micron. That is far below the wool production of the commercial farmers of the Eastern Cape who are producing between 4kg to 5kg per sheep at an average growing period of 12 months. The lack of proper fencing and camps causes major reproduction problems. The lambing percentage of the ewes is 94.85%. The weaning percentage referring to the reproductive efficiency of the mated ewes is only 17.24%. The survival rate of the lambs born alive is only 18.18%. Reproduction is the biggest problem of communal farms.

Effective livestock- and grazing management systems for communal areas are essential for the successful development of farmers on communal grazing areas. Unfortunately the Hewu farmers still have many problems effecting their wool production and the production of lambs.

END

SUMMARY

1. RESEARCH AREA

The Hewu area is formed by 22 villages. It is situated between Queenstown (20 km) and Whittlesea (15km) in the Eastern Cape Province of South Africa. In this area communal farming is practiced. Livestock and livestock products (wool) are the main sources of income. The livestock are grazing on a communal grazing area. The research area is under Hewu tribal authority known as KwaZulu Zimema. Hewu forms a part of the former Ciskei. The former Ciskei is an area fronting onto the South Eastern coast of Southern Africa (Indian Ocean). The boundaries on the coast are between East London and the coastal resort of Port Alfred. The Ciskei then stretches North-Westerly to Queenstown. The Western boundary is marked by the Great Fish River and further inland, the Cat River, while the Swart Kei and Klippaat Rivers form the Eastern border.

The farmers are mainly farming with pure bred Merino sheep and pure bred Döhne Merino sheep. There is also some Döhne Merino and Merino cross bred sheep. Cross breeding only occurs when there are no other rams available. Cross breeding is overall not part of their breeding practices.

2. RESEARCH PROBLEM

The lack of production, reproduction and management information for communal farmers result into an ineffective communal farming system in the Hewu area.

3. RESEARCH METHOD

The research method consisted of a structured questionnaire followed by interviews for the completion of the questionnaires.

The questionnaire (Appendix A) consisted of 65 questions and 10 categories of indicators (sections) namely:

A. General
B. Production
C. Selection practices
D. Mating and reproduction
E. Purchasing of rams
F. Animal health

G. Feeding
H. Lamb Mortalities
I. Fecundity (Fertility)
J. Marketing

4. RESEARCH OBJECTIVES

During the survey of this research project the following objectives and goals are set for the Hewu research area:

- To establish production norms for wool sheep.
- To establish reproduction norms for wool sheep.
- To establish effective management practices for wool sheep farmers.
- To examine key constraints of wool sheep farmers.

5. HYPOTHESIS

Skills and infrastructure constrains hamper proper management systems resulting into low production and reproduction percentages causing poverty in communal areas.

6. PRODUCTION

The farmers shear their sheep every 12 months usually in October of every year. It is preferred to shear their sheep in late spring when the weather is warm and sufficient grazing is available. The average wool production per sheep is 2.17kg. The clip averages a fineness of 19.1-20 micron.

Wool production is the major source of income for the Hewu farmers. In the communal areas of the Eastern Cape, wool produced per sheep is between 2kg and 3kg. That is far below the wool production of the commercial farmers of the Eastern Cape who are producing between 4kg to 5kg per sheep at an average growing period of 12 months. The quality of wool produced by communal farmers is not good. The main reasons for poor wool production are:

- The poor quality of rams used.
- The poor quality of breeding ewes.
- Inbreeding practices by communal farmers.

- The lack of good quality rams to purchase.
- The poor quality wool produced by communal farmers is also caused by the unavailability of good quality feed during winter months.
- In general, quality of wool produced by communal farmers is not meeting the standards set by the NWGA of SA.

7. REPRODUCTION

The farmers use two percent rams for mating purposes (Two rams per 100 ewes). The reason was that grazing is common for all the farmers and that all the rams will serve all the available ewes. Rams stay with the ewes during the year (12 months - 52 weeks) resulting in a continuous mating practice.

The grazing is not fenced off into camps causing major problems for sheep management. Farmers indicated that the best months for mating are during December and January. During those two months enough grazing is available and the ewes and rams tend to be in good condition. The lack of proper fencing and camps causes young ewes not to be separated from old ewes during mating. The farmers also do not understand why young ewes need to be mated separately from old ewes. No teaser rams are used.

The lambing percentage of the ewes is 94.85% (Number of lambs born alive (4384) divided by the number of ewes mated (4622)). The weaning percentage referring to the reproductive efficiency of the mated ewes is only 17.24% (Number of lambs weaned (797) divided by the number of ewes mated (4622)). The survival rate of the lambs born alive is only 18.18% (Number of lambs weaned (797) divided by the number of lambs born alive (4384)). The farmers do not welcome twins. They do not want twins because twins are requiring more attention.

Mating and reproduction are some of the most important factors for sheep management. It is clear that the farmers have many problems which effect their

production poorly. Reproduction is the biggest problem of communal farms. Reasonable lambing percentages can be seen on the communal farms. Many lambs died few weeks after birth, which resulted in very low weaning percentages. Low weaning percentages affect the selection of replacement ewes and the sale of surplus livestock negatively. High death percentage of lambs after birth is mainly caused by lambing during the winter months of the year. Apart from the cold spells during the winter months, there is also no good quality grazing available.

A key requirement for sustainable communal development is the integration of communal planning with the Department of Agriculture planning process. In order to achieve sustainable agriculture in the communal areas, land use must be ecologically sound, economically viable and socially acceptable.

8. MANAGEMENT

Farmers inoculate sheep against pulpy kidney, blue tongue and enzootic abortion during dry and normal seasons. Pulpy kidney is regarded as the most important disease. The sheep are dipped four times a year. Most farmers are dipping their sheep against sheep scab and Karoo paralysis tick. The sheep are dosed against roundworm, tapeworm and liver fluke.

The farmers do not make use of creep feed for ewes during a normal season or a dry season. They also do not supplementary feed ewes during the late pregnancy stage. During the lactating phase, 73% of farmers do supplement the lactating ewes using planted pastures. Other farmers (19.27%) use rested veldt as a form of supplementary feeding for the lactating ewes. The most important reasons for the high lamb mortality rate are due to poor veldt conditions, poor mothering characteristics and predators/vermin. Stillborn lambs do not occur in the area.

When selecting for wool sheep, the farmers select for body weight, conformation and fertility. When the selection for rams is done, wool quality is the most important characteristic, followed by length of the wool and the staple formation. When selecting for ewes, fineness of the wool is the most important characteristic followed by length and staple formation.

No ewes are culled that did not take the ram because the farmers did not identify the ewes that did not lamb. The other reason mentioned was that because of the small numbers of animals, the farmers cannot afford to cull the ewes. No culling takes place of ewes with weak mothering characteristics either, reasoning the small numbers of ewes and the fact that they are not marked properly.

No rams are bought at auctions because the former Ciskei government used to supply farmers with rams. Some rams were bought from fellow farmers or direct from ram breeders out of hand. Formal ram auction do not exist in the area of investigation.

No slaughter-lambs are sold. There is just not enough numbers to sell any surplus stock. In some cases farmers are selling adult weathers and old ewes to the local markets.

The limited number of young ewes results in communal farmers being unable to select young ewes for replacement purposes. All young ewe lambs are kept for the replacement of old ewes. This is a problem as it transfers poor traits from one generation to another. This can also be seen as negatively impacting on wool production and the size of the animals.

Mortalities of lambs among the communal farmers are high due to:

- Lambing during winter months when grazing is limited and the weather is very cold. Farmers on the communal farm are letting nature takes its

course when it comes to mating. Mating of ewes is not controlled and managed by farmers.

- The other aspect causing high death percentages of lambs is due to a lack of farm management skills.
- Predators are causing major problems in the farming communities.

9. CONCLUSION

It is clear from the discussion that the long term sustainability of wool production in the Hewu area is closely linked to the availability of suitable or appropriate natural resources and infrastructure. Currently the resources available, the internal and external infrastructure in the Hewu area, are not maintained well enough to support the effective utilization of the resources for successful wool production. The influence of the rapidly increasing population growth results into a greater demand for natural resources. Effective livestock- and grazing management systems for a communal area is essential for the successful development of farmers on communal grazing areas.

END

CHAPTER 1

OVERVIEW OF THE WOOL INDUSTRY

1.1 INTRODUCTION

Chapter 1 will provide some background on the history of wool production in South Africa and the national and international position of the wool industry in South Africa. It will conclude with wool production in the Eastern Cape communal areas, problem statements, objectives and the hypothesis of the study.

1.2 HISTORY OVERVIEW OF WOOL PRODUCTION IN SOUTH AFRICA.

The first sheep that were kept at the South point of Africa were “vetstertskape” (Afrikaners) and were kept mainly for meat production. The first merino farming venture dates back from 1800 and started in the area of Darling in the Western Cape. On the farm Grootpost, Darling, the Cape Government bred pure merino rams to distribute amongst farmers. The upgrade from “inheemse” sheep to wool sheep, also pure merino sheep, started spreading quickly from 1850 (Brand, 1998:1).

The sheep and wool industry is one of the oldest agricultural industries in South Africa. It plays an important economic role as an earner of foreign exchange for the country, and provides employment to some 250 000 people. Although carpet type wool have been produced in North Africa for centuries, the production of fine apparel types on the African continent only commenced with the arrival of the first Merino sheep at the Cape in 1789, and the subsequent establishment of the wool sheep industry on commercial basis under British colonial rule (1806-1910). During the whole of its colonial period, the Cape Province remained the most important wool-producing area in South Africa. The sheep industry spread rapidly throughout virtually the whole country during subsequent years.

According to census recordings (Halloways, 1925:418) the total wool sheep population in the Cape Province (8.5 million) in 1904 was approximately 72% of

the total wool sheep population of South Africa (11.8 million). In 1924 the number of wool sheep increased to 14.7 million from a total of 27.1 million wool sheep in South Africa. That was a decrease from 72% to 54% of the total number of wool sheep in South Africa. Non–wool sheep were 3.3 million in 1904 and 3.6 million in 1924. According to those figures it seems that the Cape Province historically made a vast contribution to wool and meat production in South Africa.

1.3 NATIONAL POSITION OF THE SOUTH AFRICAN WOOL INDUSTRY.

During 1965/66 wool production in SA reached a peak of 148.3 million kg (fat wool). During 1978/79 a low point was reached, when only 98.8 million kg was produced. The 1982/83 wool production then increased again to 107.3 million kg (De Klerk C.H., Düvel G.H and Terblanche E. le F., 1983:12). During the 1998\99 season only 54 million kg of wool was produced. This decrease took place progressively (Cape Wools SA Yearly Report, 1999:4). Wool production during the 1999\2000 season decreased for the first time lower than 50 million kg with an eight percent decrease from 1998\99 (Agric Review, 2001:6). South African wool production is today the lowest since 1917. (Wool Farmer, 2001:10)

According to De Klerk *et. al.* (1983:14) statistics showed that in the period from 1960 until 1969 a reasonable constant sheep population of approximately 36 million were maintained, of which the merino sheep component was between 27 million and 28 million. There was, however, a decrease of 7.5 million merino sheep for the period 1969 until 1982, whilst other wool sheep numbers increased from 2.7 million to 4.7 million and non-wool sheep numbers from 4.2 million to 5.7 million. Further analysis of the statistics indicated that the merino sheep component made up 76.2% of the total sheep population in 1969 compared to only 63.5% in 1982. According to Table 1.1 the merino sheep component was only 51.99% in the year 2001 and 55.30% in 2006. The latest numbers of Merino sheep, other wool breeds and non-wool breeds are shown in Table 1.1.

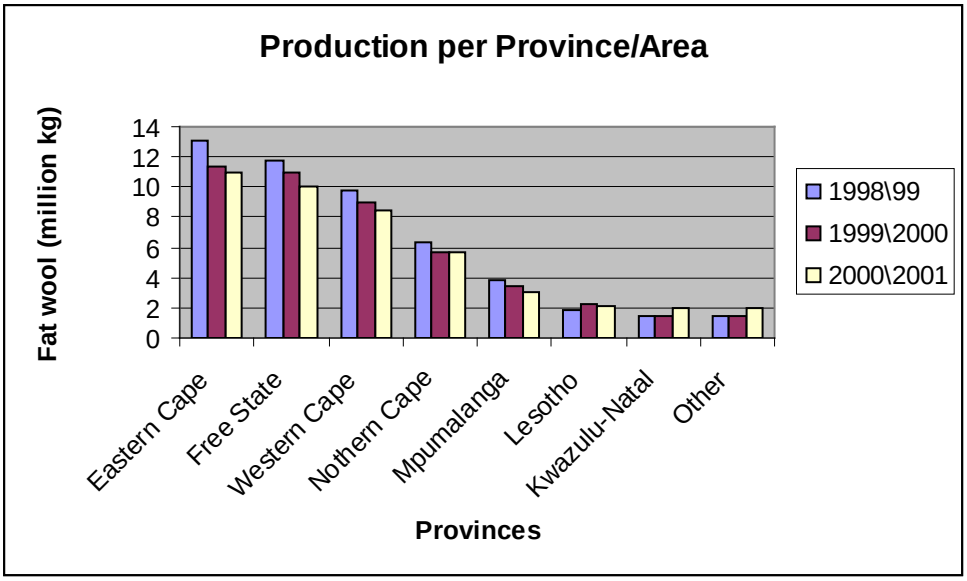
Table 1.1: Sheep numbers (million) in South Africa 2001 - 2006

Year	Merino	Merino percentage of total (%)	Other wool breeds	Non-wool breeds	Total
2001	11,943	51.99	4,145	6,883	22,971
2002	12,265	54.29	3,779	6,545	22,589
2003	11,801	52.06	4,364	6,503	22,668
2004	11,383	51.12	4,583	6,301	22,267
2005	11,771	52.98	4,226	6,217	22,214
2006	12,118	55.30	4,567	5,226	21,911

Source: Department of Agriculture 2006.

The percentages in table 1.1 show a slight increase in the numbers of the Merino sheep proportionally to the other breeds within the total sheep population of South Africa. According to statistics of Cape Wools SA, the Eastern Cape Province produces the most wool (14.1 million kg) in South Africa, compared to the other provinces.

Figure 1.1: Wool production per Province/Area 1998/1999 – 2000/2001 (million kg greasy wool)



Source: Cape Wools SA 2006/2007.

Figure 1.1 illustrates the significant decrease in wool production of the different provinces from the 1998/1999 up to 2000/2001 seasons.

Table 1.2: Wool Production per Province/Area 2004/2005–2006/2007

(million kg greasy wool)

Province	2004/2005	2005/2006	2006/2007
Eastern Cape	13.6	12.3	14.1
Free State	9.8	9.1	10.3
Western Cape	8.0	7.8	8.3
Northern Cape	5.5	5.2	5.5
Mpumalanga	2.6	2.5	2.6
Lesotho	3.1	3.7	3.3
KwaZulu-Natal	1.0	0.7	0.8
Other	0.5	0.3	0.6
Total	**44.1**	**41.6**	**45.5**

Source: Cape Wools SA 2006/2007.

Table 1.2 shows that there is an increase greasy wool production for the 2006/2007 season.

1.4 INTERNATIONAL POSITION OF THE SOUTH AFRICAN WOOL INDUSTRY.

South African wool is largely on export commodity, in both greasy and semi-processed form. It is produced and traded in a sophisticated free market business environment into the international marketplace, where supply and demand forces determine price levels (www.capewools.co.za).

Australia is the largest wool producing country in the world. The Australian total wool clip has decreased the past few years with approximately 50 000 ton to 596 000 ton. The decreasing of wool production is an international tendency. All the major wool producing countries in the world produce less wool.

Table 1.3: Wool production of main export countries 2005/06-2006/07

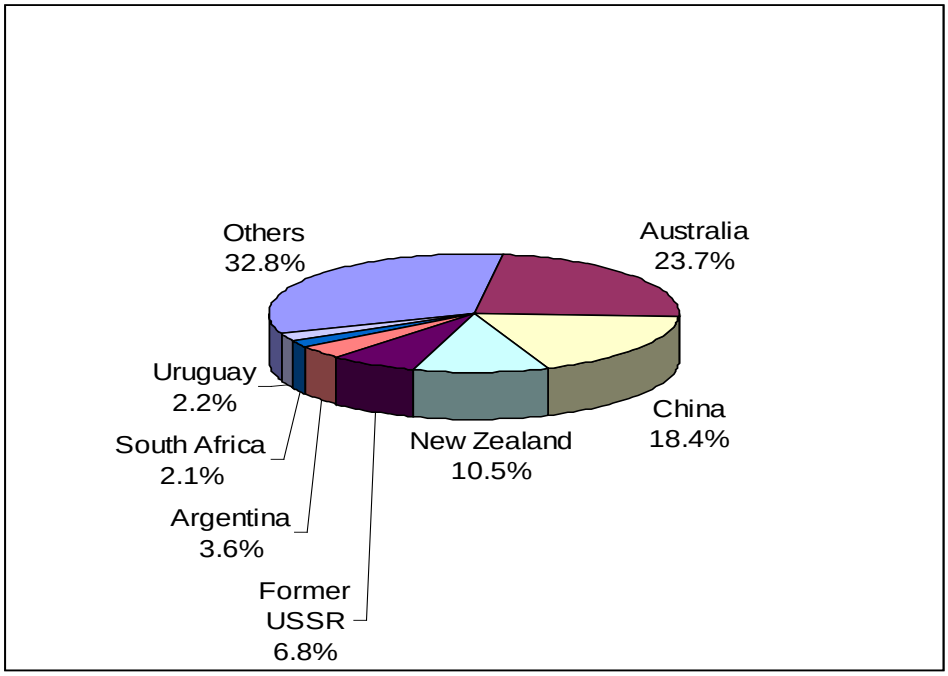
(million kg clean wool)

Countries	2005/2006	2006/2007
Australia	520	508
New Zealand	216	225
China	392	394
CIS Countries	12	12
Uruguay	37	46
Argentina	80	77
South Africa	46	45

Source: Cape Wools SA 2006/2007.

Table 1.3 shows a slight decrease in the wool production of all the major export countries, except New Zealand and Uruguay.

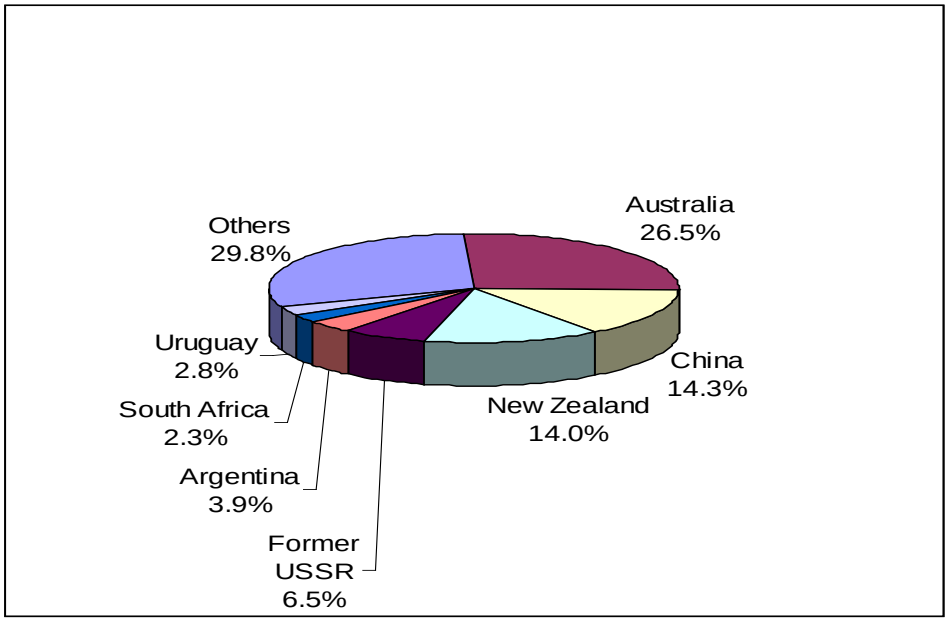
Figure 1.2: World Wool Production: Greasy Wool (2006/2007)



Source: Cape Wools SA 2006/2007.

The world production of wool is approximately 2 147 million kg wool, whilst South Africa produces approximately 45 to 46 million kg. South Africa produces approximately 2.1% greasy wool of the total world production (Strydom personal communication. 2006). Graph 1.2 illustrates that Australia produces 23.7% of the greasy wool of the world, followed by China (18.4%) and New Zealand (10.5%).

Figure 1.3: World Wool Production : Clean Wool (2006/2007)



Source: Cape Wools SA 2006/2007.

Figure 1.3 illustrates the same pattern as graph 1.2 with Australia (26.5%) being the largest clean wool producer in the world followed by China (14.3%) and New Zealand (14%). South Africa produces 2.3% of the world's clean wool.

The South African wool industry provides a high quality, environmentally sound product, which meets the needs of the textile industry. On farm classing and clip preparation of greasy wool is of a high standard and is considered one of the many tangible assets of the industry. South African wools have over the years earned a reputation for uniformity, softness to the touch and other quality features (www.capewools.co.za).

Table.1.4: Main export destination of the South African wool clip (2006/2007)

Country	(million kg clean)	% of Total
Italy	5 223.6	19.1
Germany	3 432.1	12.6
China	7 875.1	28.8
France	460.1	1.7
Korea	526.8	1.9
Czech Republic	4 320.3	15.8
UK	1 113.2	4.1
Mauritius	393.4	1.4
USA	299.3	1.1
Spain	703.3	2.6
Bulgaria	942.3	3.5
India	1 353.6	5.0
Other	669.3	2.4
Total	**27 312.4**	**100.0**

Source: Cape Wools SA 2006/07.

China (28.8%) is the destination where South Africa's largest percentage wool export is shipped to, followed by Italy (19.1%), Czech Republic (15.8%) and Germany (12.6%).

1.5 WOOL PRODUCTION : EASTERN CAPE PROVINCE COMMUNAL AREAS.

During the 1997\98 season, only 222 610 kg wool was sold through formal channels with a total value of R 1,5 million. This figure increased to 2 345 991 kg with a value of R 30 791 496 million during the 2006/2007 season. The latter represents approximately 51,2% of the total clip of the Eastern Cape. It therefore is clear that the informal market is still significant. The average price per kg received was 1 313c in comparison with the 2 594c of the national clip. It is clear

that significant improvements are still possible. The main factors for the low average price received in comparison with the national average are : contamination, low clean yield, bad classing and under weight bales. (NWGA of SA, 2006/2007).

Table 1.5: Wool production: Eastern Cape Province Communal Areas

Season	Kilogram	Value (Rand)
97/98	222 610	1 502 908
99/00	336 700	1 965 557
01/02	535 911	6 927 640
03/04	2 029 556	17 768 955
05/06	2 222 883	14 954 931
06/07	2 345 991	30 791 496

Source: NWGA of SA 2006/2007.

1.6 PROBLEM STATEMENTS

The lack of management systems for communal farmers results into ineffective communal farming in the broader Hewu area.

1.6.1. Sub-problem

The following sub-problems were identified from the major problem statement:

- The limited existence of production standards for wool (kilograms wool per sheep shorn, fineness, clean yield and length).
- The lack of reproduction standards (selection, lambing percentage and weaning percentage).
- The difficulty of access to management information by farmers on grass root level.

1.7 OBJECTIVES OF THIS RESEARCH

The following objectives are envisaged:

- To establish production norms for wool sheep.
- To establish reproduction norms for wool sheep.
- To establish effective management practices for wool sheep farmers.

1.8 HYPOTHESIS

Skills and infrastructure constrains hamper proper management systems resulting into low production and reproduction percentages causing poverty.

1.9 CONCLUSION

An analysis of export figures for 2007/08 shows that South Africa has become a primarily grease-wool exporter. Grease wool exports accounted for 71.3% of the total free-on-board value of wool export. The main grease-wool importers were China, taking up 13.98 million kg, followed by the Czech Republic with 6.99 million kg, India 3.77 million kg, Italy 2.66 million kg and Germany 2.27 million kg. The total grease-wool exports have increased by 39% in the period 2004/05 to 2007/08 (Cape Wools SA, 2008:2).

An overview was given of the history of wool production, the national and international positions of the wool industry in South Africa, wool production in the Eastern Cape Province communal areas and then closing the chapter with the problem statements, objectives and hypothesis of the research study.

Chapter two will cover the literature study. A literature overview on the human needs and aspirations, small-scale farmers, management, management strategies, production, reproduction, animal health and feeding will be discussed.

CHAPTER 2
LITERATURE STUDY

2.1 INTRODUCTION

In this chapter a detailed overview is given on the human needs and aspirations, small-scale farmers, management, management strategies, production, reproduction, animal health and feeding. Accordingly a theoretical framework for this study will be provided.

2.2 HUMAN NEEDS AND ASPIRATIONS

The pre- 1994 government policy of separate development has created development challenges, especially in the former homelands of Qwaqwa, Kwandebele, Ka-Ngwane, Kwa Zulu, Lebowa and the TBVC states (Transkei, Bophuthatswana, Venda, Ciskei). The present challenge is to meet the needs and aspirations of an expanding and developing population. The most basic of these requirements is to improve livelihoods. Scogings, De Bruyn and Venter (1999) reported that many of the people, who live in these areas, depend on natural resources for their livelihoods. The needs and aspiration of people could be met through the development of sustainable livelihoods, taking into account the available natural, physical, social, financial and human resources. Most of the rural farmers on communal grazing areas in African countries desire to improve their standard of living (Mukhala, 1999). Farmers on communal grazing areas would also like to make a profit, generate income, increase well being and improve food security and the sustainability of environmental resources.

Brundtland, Khalid and Agnelli (1986) found that the fulfilment of human needs and aspiration is the major objective of both developing and developed countries. Sustainable development requires meeting the basic needs of all and extending to all the opportunity to attain their dreams for a better life. Carney (1998) explains that a livelihood comprises the capabilities, assets (both material and social resources) and activities required for a means of living. A livelihood is

sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, both now and in the future, while not undermining the natural resource base. Scogings *et. al.* (1990) believe that, in order to achieve sustainable agriculture in the communal grazing areas, land use must be ecologically sound, economical viable, socially acceptable and politically supported. Sustainable agricultural production and the conservation of natural resources should be emphasized in the agricultural policies of South Africa.

2.3 SMALL-SCALE FARMERS

According to Kotsotoane (1999), small-scale or smallholder agriculture in Africa has characteristic features that distinguish it from large-scale agriculture. In general, smallholder agriculture, which is not homogeneous, is a low-input and low–output system with wide social dimensions impacting positively or negatively on productivity. Paradoxically, however, small-scale agriculture is the linchpin of rural development in many African communities.

There are several definitions of small-scale farmers. Kirsten & Van Zyl (1998) regarded “small-scale farming “in South Africa as often equated with a backyard, non-productive, non–commercial, subsistence type of agriculture that is found in the former homeland areas. It is generally associated with black farmers, creating the perception that black farmers do not have the ability to become large-scale commercial farmers.

Van der Mey (1995) defines a “small-scale farmer in the new dispensation as “anyone who uses cattle and agricultural resources to derive all or part of their livelihood from cattle”. This definition recognises the farming community and its environment as a continuum or spectrum. Small-scale farmers are usually known as producers with limited resources and can also be divided into different categories:

- Pre-commercial (step-up progressive), with a reasonable income from farming. Mainly black and with limited resources and under communal, leaseholds or freehold tenure. Willing to learn improved farming techniques.
- Semi-commercial (step-up) and not earning enough from farming to give up other tenure arrangements including share cropping.
- Sub-commercial (subsistence), with a negligible surplus for sale or storage. Extremely small parcels of resources (finance, power, equipment, input and information). Upward mobility is restricted (Dillon(1998), Kirsten & Van Zyl (1998) and Kotsokoane (1999)).

Small-scale farmers constitute the bulk of the world's farmers. Small-scale farmers operate in a context of increasing local population pressure, with a very small resource base and a chronically low standard of living (Sirur & Van den Brink, 1995). Small-scale farmers live in the margin rather than in the mainstream of society in terms of political influence and the provision of health, education and other services, and usually live in absolute poverty (Dillon & Hardarker, 1993).

To be successful, small-scale farmers should be equipped with good management practices, technical skills and comprehensive financial management and extension support.

2.4 MANAGEMENT

Management means to lead and to have control over something going into a particular direction. Any organization consists of people and resources striving for specific objectives. However organizations do not reach their own objectives. Notwithstanding the people, equipment and expertise in the organization, one important element is required to enable to steer the resources and activities to achieve the objectives. This element is management. Without management, focused orientated actions are not possible.

According to Cronje (1997:95) management is the key element in any organization for the following reasons:

- Management is necessary to steer an organization to achieve objectives. Without the input of a manager the resources of the enterprise will not be directed towards the objectives.
- Management is necessary to achieve balanced operations in the organization. In the micro environment of the organization a balance should exist amongst the objectives of the organization and the resources available to achieve these objectives, the personal goal of employees and the interest of the owners.
- Management is also needed in the organization to ensure a balance with the environment. Management adapts the organization to the environment by accommodating environmental changes. Management strives to balance the organization and the environment by changing the environment to achieve the goals of the organization.
- It is important for management to achieve the goals of synergy and the highest possible production. Management strives to use the lowest possible inputs from production material to achieve the highest possible outputs.

With reference to the background portrayed in the introductory discussion of management, it can be simply defined as a process that is utilized by managers to achieve the goals of the organization (Cronje, 1997:95).

Farm management can be seen as a process where a farmer organizes all the production factors namely ground, labour and capital in his farming venture in order to pre-plan, motivate, co-ordinate and control in order to achieve certain goals like maximum profit, growth and an improved standard of life (Standard Bank, 1988:2).

The strategic management process, which usually exists out of 6 intertwined steps, is nothing else but thorough planning and management. (Standard Bank, 1999:5). This process can only be successful if all 6 steps are adhered to.

- **Step 1: Formulating a mission statement:**

  The mission of the enterprise is the platform from where the organization moves. It is important to answer certain questions before the mission of the farm can be formulated:

  - What is the nature of the farming?
  - Where/what is my market?
  - Where is the farming heading to?

- **Step 2: Formulation of farming goals:**

  Farming goals form an integral part of the mission. The mission can be seen as a concise description of how and why the farming goals should be achieved. Goals give direction to the organization, assist with the planning process and enable the farmer to determine the current situation and the way forward.

- **Step 3: Evaluation of the farming venture environment:**

  Environment is used in a narrow as well as a broad sense. In the narrow sense the farmer must study the physical, biological, climatically and other factors which have a direct influence on the farm. This type of information will set the production boundaries of the farming operations i.e. livestock and crop production. In the broader sense, the manager must manage the technological changes in the market environment, government governance, which also has an influence on the management of the farming venture.

- **Step 4: Strategic development:**

  Given the mission and goals, the physical and economical environment of the farming venture, the farmer will have to decide how these goals will be achieved. It is also imperative to establish which goals should be achieved at

certain dates. In this part of strategic planning the physical, economical and financial aspects should be integrated.

- **Step 5: Applying the strategy:**
  The art is to manage the planned physical and financial factors without derailing the process. The entire proceeding element is now put into work.

- **Step 6: Evaluating the results and performing remedial steps if necessary:**
  Progress must continuously be evaluated towards the goals. As the farming venture is a total system, the farmer should be thoroughly aware of the fact that balance in a synchronized development process is necessary. The results of all processes in the total system, positive or negative, must be continuously considered in the light of physical and financial implications.

2.5 MANAGEMENT STRATEGIES

Management strategies are defined as the sum total of the management practices which takes place. Grounded knowledge of animals characteristics, feeding requirements, grazing habits, sicknesses (their healing or prevention) the veldt and plantation as well as the reaction of both the animal and the veldt on the grazing and saving of camps is necessary to ensure good management. (Hugo & Badenhorst ,1957:142).

A good herd program and adapted animals will ensure that farmers operate an economically passed sheep farming (Ferreira, 2002:1). According to Ferreira (2002:1) sheep farmers have full control over the two most important factors which will enable them to make a success of sheep farming, namely:

- Flock management
- Breeding

If these two factors are managed correctly, farmers can be assured that they will achieve economical success.

2.5.1 Flock management

Flock management relates to environmental factors such as feeding, sickness and parasite control, breeding and breeding methods, as well as the handling of animals. Flock management practice will determine how the genetic potential of a flock is realized. Good knowledge of grazing, feeding and animal production is of cardinal importance.

2.5.2 Breeding

Breeding improvements is determined by genetic factors and can be controlled by making use of good rams, select ewe lambs which are genetically better than their mothers for future breeding purposes, the culling of unproductive and uneconomical producers and the correct application of general breeding practices. If the principles are applied correctly, the average quality of meat and wool production as well as the reproduction results of the flock will be increased.

2.6 MANAGEMENT OF NATURAL RESOURCES

The management of natural resources in South Africa is regulated by the Conservation of Agricultural Resources Act (43\1983) (CARA), which empowers the Minister of Agriculture to take wide ranging steps to protect the natural agricultural resource base of the country. In particular, the Act aims to combat and prevent soil erosion, protect water sources and control invader plants and weeds. The powers of the Department of Agriculture and the Minister of Land Affairs can be summarised as follows (Department of Land Affairs, 2001):

- the cultivation of virgin soil,
- the utilisation and protection of cultivated land,
- the irrigation of land,
- the regulating of the flow pattern of runoff water,
- the control of weeds and invader plants,
- the prevention and control of veldt fires,

- the protection of water sources against pollution, and
- exercising control over the maximum number and type of animals that may be kept on veldt.

The Act provides that land users must, at all times (except where the Act or a scheme provides otherwise), maintain a soil conservation plan at their own expense. (Department of Land Affairs, 2001).

Embarking on a farming enterprise without assets, managerial experience or skills is not only frustrating, but also affects the level of production and may lead to the failure of the enterprise (Claassen, 1998:33). Barnard and Nix (1973:10), as well as Gordijn and Whitehead (1995), state that adequate management and management ability are key factors in making a profit from dairy farming. Management skill, knowledge and familiarity with livestock raising, especially feeding and veldt management practices, are essential for small-scale farmers.

2.6.1. Environmental challenges

Environmental challenges, issues and options differ significantly according to climate and land capabilities. The environmental challenge is to identify the policies, institutional arrangements and technologies that will enhance the positive and mitigate the negative effects of grazing. According to Botha and Stevens (1999), the occurrence of veldt deterioration has regularly been reported in South Africa since 1775, and several extension and research programmes have been launched to address this problem.

2.6.2 Land degradation

Early veldt management recommendation (developed during the 1940's) in South Africa emphasised the importance of rest during the critical growth phase (Haschke & Kirkman, 1994). The severity of degradation depends both on the degree to which production is reduced and the duration for which it is reduced (Scholes, 1994). Degradation is a complex problem with various levels of

causation. Seely and Jacobson (1994:21-36) and Berliner (1999:1-11) distinguished between ultimate and proximate causes of degradation. Ultimate causes can be roughly categorized as political, administrative, economic or social in nature.

2.6.3 Grazing system

Klug and Webster (1993) are of the opinion that “before starting a plan, it is essential to assess the available natural resources and their present degree of utilisation’’. Scogings *et. al.* (1999:2-11) further argue that “in order to achieve sustainable agriculture in the communal rangelands, land use must be ecologically sound, economically viable, socially acceptable and politically supported”. A team of researchers from Plaas (1999) concluded that veldt must be looked after well so that the grass and soil are not damaged and animals can get enough food. Scholes (1994) concludes that soil and grass have a symbiotic relationship. If grass is overgrazed by animals, the sun will dry up the soil so that grass roots cannot hold the soil, which means the soil can be eroded, grass will not grow on it again and animals will have less food.

2.6.4 Management

Botha and Stevens (1999:28) reported that sound management of environmental resources is of the utmost importance. Veldt management research and extension education, training and practice in general have to take cognisance of and develop more participatory approaches to extension.

According to Stewart (1995), management is the most important factor for successful farming. As a result of the diversity of skills required, successful farming makes greater demands on management. Stewart (1995) stresses the fact that livestock farming may be conducted as a sideline to some other enterprises or as a single enterprise by the specialist livestock farmer. There are several approaches to resource management. At a broad level, resource management studies take the physical environment as one possible departure

point, and the human attributes and the interaction between physical and human attributes, as the other two possible departure points. For organisational convenience, the human or managerial attributes are frequently grouped under the ethnological approach (Claassen, 1998:33).

The ethnological approach stipulates that cultural differences influence the way people perceive and use the resources of their environment. The use of a resource is therefore related to specific cultural themes and different perceptions of resources. Management is a farmer's understanding of what to do and when to do it. Sanitation, ventilation, feeding, treatment, close observation and the provision of adequate space for water, feed, rest and exercise, are all important management practices (Stewart, 1995).

2.7 REPRODUCTION

Reproduction is the single most important biological and economical factor determining the productivity of a flock. This is also basic in any attempt for progress in animal husbandry through selection. The importance of reproduction lies in the following:

- Maintaining breeding stock
- Supplying surplus animals for replacement and sales
- Maintaining an effective selection differential (Hofmeyer, 1984:5)

For the purpose of this study reproduction refers to the lambing and weaning performances of the research area. As the ram is responsible for creating a number of lambs, preparing the ram for mating is very important. If the ram is not in a good physiological and anatomical condition, optimal use of the ram cannot take place. (Schutte *et. al.,* 1986:113)

Optimal reproduction of the ewe is determined by:

- The number of normal egg cells developed and released during ovulation
- The number of egg cells fertilized
- The number of fetes which develop, survive and are born

- The number of lambs which are born which can be used for productive and reproductive purposes in the flock. (Schutte *et. al.,* 1986:114)

According to De Klerk *et. al.* (1983:105) reproduction is the most economic factor in small livestock farming, and this relates to profitability, selection possibilities and genetic progress of the flock. In order to ensure optimal reproduction and utility, preparation of the rams and ewes the last two months before mating is essential. (Coetzee, 1998:1)

Spermatogenesis takes place over a period of at least 6 weeks and feeding must be intensified over a period of two months or more before mating takes place. Rams bought at auctions must be allowed a two months adaptation period in order to prevent temporary infertility. Rams must get enough exercise and remain fit. For a flock 2% - 3% rams are recommended. (Schutte *et. al.,* 1986:114) It is recommended that for young ewes a higher percentage rams (up to 4%) is used. The more times a ewe is mated, the more likely it is that she will get pregnant and the better the chance of twins. (Coetzee, 1998:1)

2.7.1 Management of the ewe

The ewe must also be prepared for mating and it must be ensured that she can raise her lamb. Ewes should be dosed with Vitamin A one month before mating. Consistent, balanced feeding throughout the year determines meat and wool production, puberty and reproductive abilities. It is the body mass of a young ewe that determines reproductive abilities and not her age. Young ewes which grow at a steady rate from the start are sexually mature sooner than young ewes which do not eat well. Ewes should be mated with short wool; otherwise they should be sheared before mating. (Schutte *et. al.,* 1986:114) Farmers should remember that young ewes are on heat for a shorter period (30min-24hours) than mature ewes (12hours-36hours). It is therefore more possible that a ram might skip a young ewe, therefore the higher the percentage rams with young ewes. (Coetzee, 1998:1)

2.7.2 Selection

Selection is of course an important factor as far as reproduction is concerned. According to Ferreira (2002:1) a flock should be kept young and vital, and therefore 25% of the ewes should be replaced annually. Young ewes normally have a lower reproduction percentage than the flock average, but this increases with maturity and peaks at 4-5 years of age. If there are too many ewes over 5 years of age, lambing percentage can be negatively influenced, while the lamb mortality rate is also higher. Older ewes are more inclined to lamb later in the season, and they are also more sensitive to bad feeding conditions and need more supplementary feeding in dry times. Regular elimination of older ewes should therefore improve lambing and weaning percentages.

2.7.3 Selection of rams

According to Steyn (1996:14) rams must be selected from fertile families. Testing of rams for fertility, sexual diseases and mating ability is essential. Rams must be well grown, fit, healthy and full of vitality, with the ability to fertilize lots of ewes through the mating season. Physical defects, especially weak hind legs (upright heels and weak joints), overlong scrotum and hanging penis should be guarded against. A lively ram with a strong constitution, in growing condition and well shorn (6 weeks before mating) will be the most effective over a 34 day mating season.

2.7.4 Breeding

According to Ferreira (2002:1) the success and profitability of a sheep enterprise is closely related to the level of lamb production. Reproduction in sheep is a complete mix of environmental factors and hormonal responses in ewes and rams. However, the ewes are affected to a greater degree than the rams. Sheep are known as short day breeders. The ratio of light to dark in 24 hour period is an important central in physiological responses in reproduction. Therefore, under natural conditions sheep will breed in the fall and give birth in the spring. Reproduction in sheep is controlled by the hypothalamus area of the brain, the

pituitary gland and the ovaries. As the amount of daylight decreases over time, this is sensed by the hypothalamus, which in turn signals the pituitary gland via gonadotrophin releasing hormones. The pituitary then stimulates the ovaries by releasing follicle stimulating hormone and luteinizing hormone. Then, the ovary secretes estrogen and a heat cycle results. Once sheep cycle, they will continue to come into estrus every 15 to 17 days until successful bred or until they reach the anestrous period. Gestation in ewes last for 144 to 152 days, depending on breed and season of lambing.

According to Steyn (1996:2-3) the economic viability of merino farming is determined by the weaning percentage. The weaning percentage is the number of lambs weaned from ewes mated, and it can only be increased if conception, lambing percentage and fecundity are high and lamb mortality is limited. Two important genetic components play a role in the breeding programme, namely:

- **Ewes:** Among ewes high fertility, milk production and maternal qualities contribute to a higher weaning percentage which is a basic requirement for genetic progress and economic success. Good quality breeding ewes are of utmost importance in the breeding programme for wool production, reproduction and milk production. The contribution of ewes selection to genetic improvement of the flock normally is 30% because a relatively large proportion of excellent genetic basis for breeding and increases the standard of the current flock and therefore the income from wool and lambs.

- **Rams:** Accurate selection of rams for production properties and quality wool, a strong constitution, fertility and vigor is essential to retain the flock's genetic superiority. Because a much smaller percentage of rams are selected, their contribution to the genetic improvement (normally 70% and higher) is the largest. The genetic improvement of the flock, especially with regard to type (skin development) conformation, amount of wool, fiber

thickness and quality, is mainly brought about by the ram. It is of utmost importance to use a good sire in one's flock. The value of sire can be determined by his conformation and the offspring he produces.

Increased reproduction ensures stricter selection and therefore faster genetic progress and the sale of more surplus animals, which results in the highest revenue from sheep farming. The reproduction tempo of woolled sheep flock in the R.S.A. is fairly low. According to the survey of De Klerk *et. al.* (1983) only 74 lambs were born per 100 ewes mated, which furthermore indicated an even lower weaning percentage than 70% (lambs weaned from 100 ewes mated) due to lamb mortality and losses.

2.7.5 The role of temperature in reproduction of sheep

The role of the temperature in reproduction of sheep is important. Most breeds begin cycling in cooler weather. Some sheep such as the Suffolk are particularly sensitive to heat stress. Other breeds, such as Dorper and Merino, tend to cycle year-round and appear to be little affected by higher temperature during breeding and early gestation. Lamb birth weight are reduced and lamb survival is decreased when temperature remain high throughout pregnancy which is often the case for fall-born lambs.

Sperm production is sensitive to temperature changes. Environmental temperature above 32 °C for a prolonged period of time will usually interfere with the production of semen. During prolonged periods of excessive heat, the ram may become sterile. This damage is usually not permanent, but requires approximately 50 days of cooler temperatures before the ram fully recovers. Heat stress is greater as the relative humidity rises. The fertile ram should be kept or have access to a cool environment (24 °C) for at least 50 days before turning him with the ewes. Shearing will help keep him cool. (http://www.nwkv.co.za).

Genetic make-up of the flock is a major factor in reproductive performance. Some breeds and lines of sheep are known for out-of-season lambing (more extended breeding season), high prolificacy, good mothering, high milk production. Conversely, some sheep are genetically incapable of responding to management practices to optimise reproduction. One of the big keys to successful sheep production is to match up genetics with environment and management systems.

2.7.6 Reproduction in sheep can be increased by the following practices:

- **Discarding of ewes**

The elimination of ewes that do not produce lambs, ewes that skip, ewes with poor maternal qualities and positive selection of ewes that produce multiple offspring and that can raise lambs and wean them, are sound practices. Ewes maintaining a high wool production, lambing regularly and weaning heavy lambs, are highly fertile, have a good milk production are functionally efficient, can be effectively selected through close observation during the lambing season and by keeping records.

- **Lambing chances – Maiden ewe**

Heredity values of as much as 40% for the number of lambs born per ewe are reported when the observations are made in the second to third season. In practice it is recommended that maiden ewes that do not lamb with the first mating should be given a second chance. About 80% of such maiden ewes constantly lamb in later years with the ability to raise their lambs. Maiden ewes that lose their lambs during the first lambing season because of poor maternal qualities should be culled. The ability to raise lambs is inherited and offers a good selection opportunity to increase the survival rate of lambs. To determine whether a ewe has raised a lamb till the weaning stage, a simple selection technique such as the “wet and dry” method can be applied.

- **Multiple births**

Merinos multiple births are common and fecundity is inherited to a greater degree. Thus the number of lambs born per ewe mated can be increased by selecting for multiple births. In practice it entails the selection of ewes and/or rams that are offspring of multiple births. It will serve no purpose to select for twins if the ewes do not raise and wean the lambs. More twin lambs than single lambs die. The economic value of twins is so high that it is justified to give special attention to them in the feeding and management programme. The effectiveness of fodder consumption of ewes with twins is 35-50% higher than that of ewes with single lambs.

- **Feeding and management**

The main factor in increasing fertility in Merino flocks (90%), is good feeding (flushing, growing condition of ewes in rested camps) and well planned management practices before using teaser rams and during the mating season, late gestation and lactation. Feeding affects all stages of reproduction, from puberty to sexual maturity, the production of eggs and sperm, higher sexual activity, start and extension of mating season and milk production.

Inadequate feeding during the abovementioned critical production phases results in lower conception percentages, lower lambing percentages, higher lamb mortality, lower weaning percentage, lower weaning weights, poor growth and development of young sheep and therefore fewer animals available for selection and surplus marketing.

Reproduction is the most important economic factor in sheep farming. It is a function of deliberate management action and the application of farming practices that influence fertility. Against this background reproduction can be used as criterion to determine the effectiveness of farming management. (Steyn, 1996:5-9).

- **Body mass (size)**

Body mass at the age of 15-18 months (two-tooth) is a good criterion for increasing the following:

- **Wool production:** Body weight at age 15-18 months has a positive influence on raw wool production because it affects the skin area. Selection for body size at two-tooth age therefore is an important component in increasing wool production per sheep.
- **Reproduction:** It was found that body weight (ewe size) at 15-18 months correlates positively with reproduction, and has a large influence on the number of lambs born. For every (4,5kg) increase in body mass, 8 more lambs are born per 100 ewes mated, while the rate of survival of lambs also improves.

According to Steyn (1996:13) who studied the influence of mating on reproduction in Merino ewes at the Carnarvon experimental farm, and finding of other researchers the following can be deduced:

- To reproduce a ewe must weigh at least 36kg during mating.
- Ewes that have twins normally weigh 40kg or more during mating.
- Ewes must have a positive mass balance before mating.
- The condition of the ewe should be not too fat or too thin.
- The lightest 5-10% of ewes within each age group (1½ to 6½ years) usually are the ewes that are not served and that can be discarded with good results.
- By ensuring that maiden ewes reach the minimum mating mass (36kg) with their first mating, the reproduction rate of the flock can be significantly increased.
- Thus it appears that the threshold value for single lambs in the flock is reached with a mating mass of about 36kg and that for twins at about 40kg.

The most effective body mass for adult Merino ewes under good feeding condition is between 50-60kg. Body mass for economic and effective

reproduction in Merino ewes ranges between the poles of at least 36kg for maiden ewes and 60kg for adult ewes.

2.7.7 Comparative wool meat ratio of Merino and the Döhne Merino

According to Geyer (2007:54) the Merino wool meat ratio is 38% income from wool and 62% from meat. The extent of the results and the norms which were determined provides a good basis upon which could be further expanded on.

The Döhne Merino wool meat ratio is 31% income from wool and 69% income from meat. Döhne Merino is a dual purpose breed producing both wool and mutton. The Döhne Merino is a highly productive sheep breed which is very well suited to the current economic climate. The hardiness and adaptability of the Döhne Merino means that high production is achieved in tough, low cost commercial situation, assuring breeders of the highest possible profits from their sheep production enterprise (http://www.Döhne.com/merinos-to-Döhnes.html).

2.8 ANIMAL HEALTH

A major problem for the farmer is very often the difficulty to identify a disease or to correctly diagnose a sick animal. In some instances it may be a very simple task but very often it requires a very experienced vet and or chemical and microscopic tests to correctly diagnose a sick animal (Mönnig & Veldman, 1986:1).

2.8.1 Bluetongue

Bluetongue is a ruthless virus disease carried by insects. The Orbi-virus which causes bluetongue has 24 stems of which 21 occur in South Africa. (Du Preez, 2001:1) According to Du Preez (2001:1) bluetongue is seasonal. It occurs in the middle of summer in autumn until the first frost occurs. The Bluetongue virus will remain on stock during winter in particular on cattle. Indigenous sheep breeds such as Namakwa Afrikaner, Black headed Persey and Karakul are less susceptible while European breeds such as the Merino are very susceptible.

According to Mönnig and Veldman (1986:7-8) the Merino is no doubt the most susceptible of all sheep breeds to bluetongue. General symptoms are that sheep show a fever (40°C - 42°C) and become restless. The mouth (tongue and lips) swell up, the sheep drivel and lick their lips. The various membranes are at first red and later on blue. The duration of the illness will be from a few days up to 2 weeks. When sheep recover there is usually a break in the wool. Bluetongue vaccine gives a reasonable long immunity. The vaccination can commence as soon as ewes have lambed in the winter. Lambs of ewes which have been vaccinated should not be vaccinated before they are 6 months old as the passive immunity lasts for a period of 6 months. The lambs of ewes which have not been vaccinated can be vaccinated from 4 weeks. (Du Preez, 2001:1).

2.8.2 Pulpy Kidney

Pulpy Kidney is a disease which occurs in South Africa and elsewhere and is caused by Clostridium Ovitoxcum. The pulpy kidney germ is widespread amongst sheep and is found in the intestinal canal of healthy sheep, but is however inactive and does not cause any damage. The inactive germs can however be stimulated by different circumstances or factors and can then multiply rapidly or release more toxins of poison which can be fatal. The duration of the disease can be quick or acute. Where signs of the disease are visible, two different cases can be identified:

- The loss of conscious and paralysis
- Nervous symptoms and convulsion

All sheep of 3 months and older can be vaccinated with pulpy kidney (Mönnig & Veldman, 1986:37).

2.8.3 External parasites

Millions of rand of damage are caused annually by external parasites, which is much more than the costs of strategic control. When concentrating on external control of external parasites, it must be borne in mind that damage caused by

external parasites will differ from area to area. The susceptibility of animals to parasites or deceases caused by parasites will also differ. (Anon, 2002:1) Substantial losses in meat and production are caused by parasites. Suppressed production of sick animals as well as inferior quality animal produce such as wool hides and skins is a direct result of the damage caused by external parasites. Indirect losses can also be described to a wide range of organisms transmitted by parasites. The production of sick animals is low. It is expensive to treat them and they may eventually die. (Anon, 2002:1) The premise from which should be departed is the accurate diagnostic assessment or identification of the relevant parasites. It is also important to simultaneously gather information relating to the lifespan and habits of the parasites.

The knowledge gained regarding parasites will be valuable during the preparation of the management program, the monitoring of the status of the parasites on the farm and, when necessary, to adapt the management program.

2.8.4 Internal Parasites

The resistance of any organism is the inherited ability to survive the deadly effect of an unfriendly and harsh environment. Registered vaccines or medicines to control parasites must be used with great care to guard against the selective resistance of internal parasites. Different medicines and/or vaccines with active ingredients should be used form time to time. They should also never be diluted or a lesser quantity used as prescribed (Anon, 2002:1).

South Africa is undoubtedly the international leader on selection and breeding of sheep which are resistant to wire worm infestation as well as the biological control there of (Van Rooyen, 2001:1). According to Van Rooyen certain sheep are less susceptible to certain worms/parasites. By cross breeding of sheep and the elimination of sheep that are more susceptible from the flock, farmers will be able to gradually and naturally increase their resistance to for example wireworm.

Certain sheep will be better equipped to handle wireworms. They develop a resistance which does not allow the worms to develop on them. Some animals are initially susceptible but later on become immune. These sheep are identified in laboratories by worm counts in faeces samples. Their worm counts are lower than others. (Van Rooyen, 2001:1).

The **FAMACHA** system is used to identify wireworm's infestation. The system compares the colour of the membrane of the eye with a colour chart which has photographs of the membranes of the eye. The membrane appears red to almost white. A red membrane shows that there is nothing wrong with the sheep. A light pink membrane is an indication that the sheep suffers from anaemia due to the fact that the wireworms destroyed the red blood cells. The more pale the membrane of the eye, the greater the wireworm infestation. It is however important for farmers to know that the **FAMACHA** system is only effective on bloodsucking internal parasites such as wireworms and not other worms such as bankrupt and nasal worms. These parasites do not rob the sheep of the blood and the eye membrane will not show a high infestation of these worms. It is therefore important that farmers on a regular basis have faeces samples analyzed to assess worm counts. (Van Rooyen, 2001:1)

2.9 FEEDING

For practical reasons grazing can be divided into two broad categories, namely:

- Green grazing, which include both growing green veldt as well as planted grazing, and
- Dry winter grazing, which represents grazing after flower stadium and where translocation of nutrition to the plant roots already took place. Because of the hardening which took place here, both the digestibility and the voluntary intake of such grazing are low. (De Waal, Baard & Engels, 1989:27).

Grazing provides in the larger part of the roughage and nutritional needs of ruminants. Where grazing falls short in this regard, the growth of the animals is

delayed with a consequent reduction in both production and reproduction. To prevent these problems, supplementary feed is given. The nature and number of supplements that must be provided are determined by the availability and quality of the grazing material, as well as the production function of the animals on the grazing. (Dickinson *et. al.,* 1993:357)

2.9.1 Stimulant feeding

Stimulant feeding is a term which refers to the increase in the nutritive level, with often a coupled increase in body mass of the ewe, during the period of three to four weeks before mating. Stimulant feeding gives rise to an increase ovulation tempo; better fertilization and consequently a higher percentage of twins and triplets are born. A decrease in body mass of the ewe three to four weeks before mating time will have the opposite result. Ewes that are in a good condition and already on a high nutritive level will rarely benefit from stimulant feeding due to the fact that they are unable to reach the required tempo of mass increase. It is therefore not economical to provide fat ewes with stimulant feeding. Any type of high energy supplements (grazing and/or grain supplements) can be used as stimulant feeding. (Schutte *et. al.,* 1986:114).

Grain ferments quicker and is likely to cause acidosis. An adaptation period is therefore necessary and where large quantities of grain are used, a buffer (ex. feed lime, slaked lime, bicarbonate of soda) must be included. It is known that sheep of about six weeks need to adapt to high starch diets (ex. grains), especially where large quantities are provided. Sheep are ruminants and roughage (straw, hay or grazing) must be available. With high concentrate diets at least 10% roughage must be available. Grazing is highly degradable (about 85%) and if protein sources are used as supplements, the best results are achieved with low degradable sources. It is especially important with young growing lambs and pregnant and lactating ewes. (Brand & Aucamp, 2000:1).

2.9.2 Supplements

According to Brand & Aucamp (2000:1) it must be kept in mind that when large quantities of urea are consumed (more than 10g - 14g per sheep per day), that it is poisonous. The consumption must therefore be limited and it must be mixed thoroughly. Salt is usually utilized as a consumption regulator. According to De Waal (1999:1) salt is very beneficial but too much could also hamper its good purpose which could lead to lower production and become a health hazard to the animals.

In order to make supplements justifiable, it must be given at the right time of the production stage. It is recommended that licks be introduced during the last six weeks of pregnancy and first eight weeks of lactation. The introduction of licks as a supplement will depend on the type of grazing, the availability of minerals and the price thereof. (Brand & Aucamp, 2000:1)

Although Sodium, one of the elements of salt, thus Sodium Chloride (NaCl) performs a very important role in the body of that of humans and animals, it is important that the intake is not too high. The problem is that most farmers cannot distinguish between physiological needs of salt for animals, their blatant desire therefore or when it is mixed together in the licks with more tasty ingredients such as molasses and other energy and protein sources. According to the latest information available, sheep require 5g - 8g of salt per day.

The disadvantages of excessive salt intake are:

- Lower wool growth
- Slower growth especially among young animals
- Lower production by ewes in lactation thus slower lamb growth
- Excessive intake could even be toxic.

  (De Waal, 1999:1)

Protein is the most critical feeding material to assist in raising colostrum and production levels and also plays a vital role in limiting lamb deaths. Lamb survival depends on the successful interaction between the ewe and lamb shortly after birth, as well as the speedy and sufficient intake of energy and antibodies through the colostrum. Insufficient colostrum will reduce the lifespan of the newborn lambs. (Coetzee, 1999:1).

According to Coetzee (1999:1) it was found in Australia that storks on a low nutrition diet with a shortage of well fed nutritional proteins only produces 977 ml colostrum, in comparison to 2078 ml by storks with high nutritional levels with enough well fed nutritional proteins. Well fed nutritional proteins is supplied by natural protein sources which breaks down slowly in the rumen, like brewers grain, fish, meat, blood, cotton oil cake and maize gluten 60-flour.

It is recommended that wool and meat producers increase their herds weaning percentages and lamb growth as well as their milk and wool production by introducing natural protein and trace elements concentrate at strategic times during their supplementary feeding program on any type of grazing. (Coetzee, 1999:1).

2.10 PRODUCTION

2.10.1 Wool production trends

During 1989 wool production was at a high level and world production peaked. In 1990 political turmoil in wool's two major markets, China (following Tiananmen Square massacres) and Russia (fall of Communism) resulted in the withdrawal of both countries from the wool market, virtually overnight. Together they bought about 36% of total world production. During 1991 world wool price collapsed and a huge stockpile was built up in Australia (4,7 million bales). In the years of 1991-1995 prices remained at low levels and the world production declined. In 1996 prices improved slowly, but the 1997 financial crisis in Asia caused prices to fall. In 2002 world wool production dropped to a 30-year low, while there was an

estimated 30% over capacity in the world primary processing chain. Supply concerns increased as a result of the deepening shortage of Merino wool for apparel. Prices rose to record high levels due to mad scramble by primary processors for raw wool and resultant strong competition on primary processing levels for wool to keep mills running. This trend is in the opposite direction to retail demand. In addition, currencies of major exporters weakened to record low levels. During 2003 the latter half of year saw downward correction as global uncertainties, slow economic growth and the outbreak of SARS rattle markets. During 2003-2005 prices remained at low levels. In 2006/2007 market started to improve on the back of stronger demand following improved global economic growth in major markets for wool. Fears of wool shortage as a result of drought in Australia caused prices to soar in the second half of 2006 and the first half of 2007. Cape Wools SA indicator rose from August 2006 to June 2007. Supply concerns not expected to impact on the market to the extend it did in 2003 (Cape Wools SA, 2008). At the close of the season, the wool market was 42% up compared from the opening of the sales. The season's average price at R 36.11 per kg (clean), was 47% higher than the average for 2005/6 – the best level since the abnormal exchange rate fluctuation. In USA terms, the market closed more than 40% higher than at the opening.

The 2006/7 season turned out to be the best in four years. The market opened with prices at considerably higher levels than the previous season, which continued to improve throughout the season. The overall indicator, at its highest level since 2003 at the penultimate scale, reached R 43.73 per kg for clean (scoured) wool. The SA Merino indicator in the last week of September 2007 was R 56.00 per kg compared with the same indicator in the last week of September 2008 on R 53.50 per kg (Cape Wools SA, 2008:1).

The new 2008/09 season got off to a shaky start when Cape Wools' Merino indicator opened almost 10% lower compared with the closing sale. The market continued to drift downward in the weeks to follow before a tumbling rand came

to the rescue and helped to push the overall indicator up at the last two sales of September 2008. Turmoil in global financial markets no doubt will exert downward pressure on the market in the months to come. It can only be hoped that the decrease in Australian production, which is expected to fall another 6% to its lowest level in 80 years, will to some extent support the wool market (Cape Wools SA, 2008:1)

2.10.2 Feeding and fibre fineness

Wool growth is largely influenced by the quality and quantity of nutrients the animal receives. The influence of nutrition on wool production, fibre diameter, and fibre length and crimp frequency is well-known. Any shortage of or deficiency in nutrition is reflected clearly and almost immediately in the thickness of the fibre. Any change in the feeding level has a greater influence on fibre thickness than on crimps per 25,4mm and the length of the fibre. An imbalance in nutrients may be the cause of a change in the ratio of crimps to fibre thickness of the wool, with the result that the wool lacks substance and bulkiness. Under nutrition reduced wool production by 31,8% and fleece density by 36%. Tensile strength decreased by 37%.

An imbalance or shortage of trace elements leads to a weakening of fibre forming, which seriously reduces the quality of wool. One of the most common mineral deficiencies occurring particularly in certain regions is a copper deficiency. The fibre became straight while deficient or incomplete keratinisation occurs in the fibre. (Steyn, 1996:59-60).

2.10.3 Wool production and skin development

In the Merino as specialised woolled breed the amount of wool per sheep is of primary importance for the highest income. When we consider the properties relating to wool production per sheep, five components are involved in increased wool production through selection, and all of them should be kept in the right balance.

These are:

- Type of sheep - degree of skin development (larger skin surface).
- Body weight - it affects the skin area for wool production
- Density - the number of fibres per square 25mmm of skin surface
- Length - length of wool in mm for growing period.
- Fineness - average fibre thickness (micron) of the wool fibre in practice also in practice also expressed as spinning count (Steyn, 1996:46-47).

2.10.4 What makes wool useful as a fabric?

Several characteristics set it apart from other types of fibre and make it a favourite of many clothing manufacturers.

- **Flame resistance**

Because of its unique physical and chemical make up, wool does not melt or support combustion.

- **Absorbency**

Wool works with the body's natural temperature regulating system to keep you warm in the winter and cool in the summer. How does it work? It all revolves around wool's absorbent capabilities. During the winter when the air is cold and damp, wool absorbs the moisture and keeps a layer of dry, insulating air next to the skin. When it is warm, it again absorbs moisture in the form of perspiration and keeps insulating dry air next to the skin. In fact, this special feature has also caught the attention of the oil industry. More and more companies are turning to wool products for help in cleaning up oil spills. Wool can absorb from 10 to 30 times its weight in oil while still repelling water. The oil can then be squeezed out and the wool can be reused up to eight times.

- **Adaptability**

Wool comes in a variety of weights and weaves. The quality of the wool depends upon the type of sheep from which it comes, and the condition under which the sheep is raised. Some sheep produce fine woollen fibres, while others grow coarse or medium ones. The wool industry uses all types. Coarse wool makes excellent carpets, medium wool turns into comfortable blankets, and fine wool produces beautiful dresses and suits.

- **Durability**

With the high cost of clothing these days, consumers want clothing that wears long and well. Wool provides persevering wear, resists snags or tears, and retains its original shape for a long time. It doesn't even wrinkle, which is good for people on the go. (Montgomery, 2007. www.ecomall.com,).

2.10.5 Factors of economic importance in wool production

According to NWGA of SA (2007) the following factors are of economic importance in wool production:

- **Fineness**: (spinning count) Refers to fibre thickness and determined mainly by the size of the crimps. The smaller the crimps the finer the wool and vice-versa.

- **Length**: The ideal is a good uniform length throughout the fleece for the age of growth i.e. period of growth. The difference in length of fleece wool packed in the same class or container must be less than 25 mm for wool longer than 50 mm, and 20 mm for wool shorter than 50 mm (See Table 2.1).

Table 2.1: The length classes of Merino wool

NWGA Length symbol	Minimum length in Millimetres (mm)	Trade length In months
AA	**Min length 90 mm**	**12/14**
A	**Min length 80 mm**	**12**
BB	**Min length 70 mm**	**10/12**
B	**Min length 60 mm**	**9/11**
C	**Min length 50 mm**	**8/10**
DD	**Min length 40 mm**	**7/9**
D	**Min length 30 mm**	**6/8**
EE	**Min length 20 mm**	**64/6**
E	**Shorter than 20 mm**	**Under 4/6**

NWGA of SA, 2007

Make every effort to maintain an even length within a line (class). Normally there are significant differences in prices for wool longer than 50mm and wool shorter than 50mm, on account of the different end–uses of the wool. Keep that in mind when deciding on shearing time and when classing wool.

- **Quality**: Quality refers to the definition and evenness of crimp, the handle and the presence or absence of deviating fibres. In practice, quality plays an important role in determining the fibre diameter.

  Degrees of quality: Good, Fair, Poor (common)

  - Good: A well–defined and even crimp, a kind handle of the wool and the absence of deviating fibres.
  - Fair: Irregular or indistinct crimp (dull appearance), a somewhat coarse handle of the wool, and indications of deviating fibres.
  - Poor: A lack of definition or regularity of crimp, a harsh handle of the wool and/or the presence of noticeably coarse fibres or hair.

- **Clean yield**: The clean yield is the percentage of clean scoured wool. Clean yield is determined by the colour and the quantity of yolk, the quantity of foreign matter such as sand, seed, etc. present in the wool, the staple formation and the tip.

  Degrees of clean yield: Light, Medium, Heavy

  - Light: White to light cream colour, good staple formation and the absence of weather or pointed tip and too much foreign matter. A clean yield of about 60% and more.
  - Medium: Deep cream to slightly yellow colour, ropy staple formation or noticeably weather or pointed tip and a greater percentage of foreign matter. A clean yield of about 55%.
  - Heavy: Yellow to rusty colour, watery staple formation or excessively weathered or pointed tip and a clean yield of about 50% and lower.

  Note: The characteristic physical properties of the wool of Merino sheep, viz. length, fibre diameter, quality and clean yield, are best evaluated in combination with each other and not separately .

2.11 PROPERTIES OF WOOL

The following commercial wool properties excels itself from other natural fibres: (NWGA of SA, 2008)

2.11.1 Wool is cool in summer and warm in winter

A property of wool that has never been imitated is that of wool's being a poor conductor of heat. This is because small air bubbles are trapped between the spirals of the fibre. Lightweight wool keeps the body cool in summer, as it is a poor conductor of heat, it repels external heat. Furthermore, the wool fibre, by breathing, allows a free circulation of air. Wool is therefore the ideal fibre for summer.

2.11.2 Wool is elastic

Because of the spiral shape of the amino acids, the wool fibre can be stretched to a third more than its normal length. When the fibre is wet, its stretching ability extends to 60% more than its normal length. This renders the fibre extremely suitable for the manufacture of garments and is therefore most comfortable to wear.

2.11.3 Wool for summer is light

Wool is naturally light in weight. This makes it the ideal fibre for clothing. Clothes that are light in weight are ideally suitable for air travel as mass is this case determining factor.

2.11.4 Wool is durable

Wool is durable fibre for clothing. A good fibre must be elastic, pliable and strong. Wool possesses all three properties. It is important that the structure of the wool fibre should be understood before the properties can be dealt with individually.

2.11.5 Wool dyes easily

Because the wool fibre absorbs moisture easily and as a result of its structure, dyes can penetrate to the core where they are retained. The amino acids in the wool fibre have free radicals or free ends that protrude. Dies react with these free radicals and then form a stable compound with the wool fibre itself. Such dyes are known as reactive dyes. The old idea that ‘wool is grey or brown’ has long since been replaced by the new fibre in a kaleidoscope of bright colours.

2.11.6 Wool does not burn easily

Proteins are noted for the characteristic that they do not burn easily and wool is no exception. Another factor that makes wool even more fire resistant is that it absorbs moisture. It will smoulder although it will not catch alight. Wool is therefore ideal to wear as protective clothing and is particularly popular with fore brigade personnel and racing drivers. Clothes that catch alight are often the cause of very serious burns. That is why wool blankets are the very things with which to extinguish flames.

2.12 CONCLUSION

This chapter indicated the importance of management supported with management strategies. These factors determine the direction for strategic planning and risk management. An overview on animal health, feeding, reproduction and wool production completed the holistic picture of farm management.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The discussion of the research area, research problems and the research questionnaire will thoroughly be dealt with in this chapter.

3.2 RESEARCH AREA

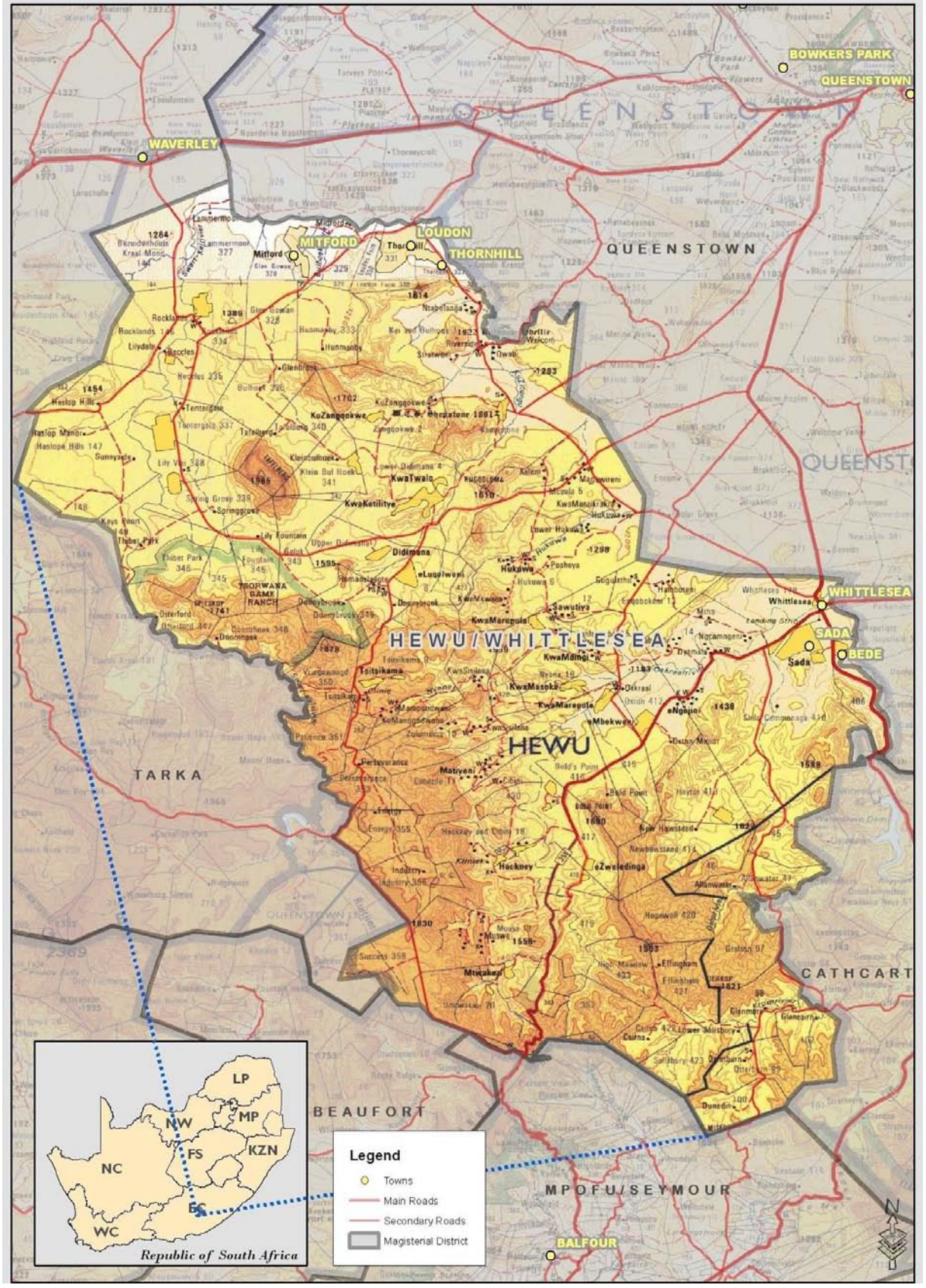
The Hewu area is formed by 28 villages. It is situated between Queenstown (20 km) and Whittlesea (15km) in the Eastern Cape Province of South Africa (Figure 3.1).

In this area communal farming is practiced. Livestock and livestock products (wool) are the main sources of income. The livestock are grazing on a communal grazing area. The size of grazing land ranges from 2000 to 5000 hectares.
In this area two types of households are practiced.

- The first type of household has access to grazing and arable land for agricultural purposes.
- Type two has not yet been granted the right to graze or the use of arable land.

The research area is under Hewu tribal authority known as KwaZulu Zimema. Hewu forms a part of the former Ciskei. The former Ciskei is an area fronting onto the South Eastern coast of Southern Africa (Indian Ocean). The boundaries on the coast are between East London and the coastal resort of Port Alfred. The Ciskei then stretches North-Westerly to Queenstown. The Western boundary is marked by the Great Fish River and further inland, the Cat River, while the Swart Kei and Klippaat Rivers form the Eastern border.

Figure 3.1 Hewu research area Location Map



The Province of the Eastern Cape is classified as the second poorest province in South Africa. This province has also the highest level of unemployment and has a population of about 6.3 million people (Department of Agriculture, 2002).
Although the Transkei and Ciskei are now incorporated with the Eastern Cape Province, the traditional “communal” area remains very much the same. De Wet (1987: 459) described the main forms of land tenure as communal tenure, quitrent tenure, free hold tenure and trust tenure (now effectively modified to communal tenure with the independence of Ciskei and Transkei).

In the Transkei and Ciskei the majority of the population is involved in communal tenure systems. The people who live in these areas usually have established a garden next to their homestead. The size of the residential site is limited to 0.43ha and the size of arable land is limited to 3.43ha (De Wet, 1987: 460-461).

During time of the former Ciskei government communal farms were under the control of chief and headman management, reporting to the district magistrate. Each village (communal farm) was under the control of the headman. The headman was the ruling body. Each village appointed a management committee for farm management in order to control farming and social activities. The headman was reporting to the chief and the chief was reporting to the magistrate.

There was also a district department of agriculture working together with the tribal authority. The department of agriculture divided the Hewu area into small sections. Each section was given an extension officer and an animal health officer. The duties of the department officials were to assist farmers with farming information. Farm management was fully under the control of department officials reporting to the village headman. The animal health aspect was fully under the control of the animal health officials. The government was supporting the communal farms with livestock medicine, which was controlled by the officials of the state.

All livestock were vaccinated according to the department vaccination programs. During vaccination dates all farmers were forced to bring their livestock for vaccination. During the day of vaccination, each farmer's livestock were accounted and recorded for the next vaccination. The village headman and his committee were responsible for making sure that all farmers brought their livestock for vaccination. If a farmer did not bring his livestock for vaccination, his livestock were not allowed to graze on the common grazing and he was also to be punished for not obeying the instruction of the state.

The state officials were also responsible for veldt management. Their duties were to check that veldt is not overgrazed and that the village is following the department rotational grazing systems. During those days grazing was properly fenced and the camps were numbered. The officials of the department were informing farmers of which camps will be rested for a period of 12 months. The other duties of the state officials were to organize livestock auctions for each and every year. The state appointed officials among the villagers to pound livestock grazing rested veldt and check the fence for repairs.

During middle 1980's the National Wool Grower's Association of South Africa (NWGA of SA) started a shearing shed system whereby all farmers are shearing their sheep in one shed. This system brought a modern system of classing of wool. The baling of wool clips was done according to the NWGA requirements. The second advantage of a shearing shed system was to cut transport cost for transporting wool to the nearest BKB depot, which is in Port Elizabeth. Due to this system, shearers were trained in order to improve their shearing skills. The advantage of the system to farmers was the wool income. Since this system was started farmers were fetching good prices for their wool. The state supported farmers with breeding rams in order to improve the quality of communal farm livestock. Mating of ewes was managed by the farm committee with the assistance of the extension officials. Rams were separated from ewes after mating. One mating season was followed per year.

During the early 1990s the system changed from a committee system to an individual management system. This change was caused by politics of the country. Villagers started destroying farm infrastructure including fencing. People with no farming rights started farming due to political pressure.

3.3 CLIMATE

3.3.1 Rainfall

The average monthly rainfall for Whittlesea over the last 22 years is illustrated in Table 3.1. The total rainfall for Whittlesea per year is 485.7 millimetres. The lowest rainfall occurs during the winter months of June and July and the highest rainfall in November to December. Figure 3.2 illustrates the annual rainfall.

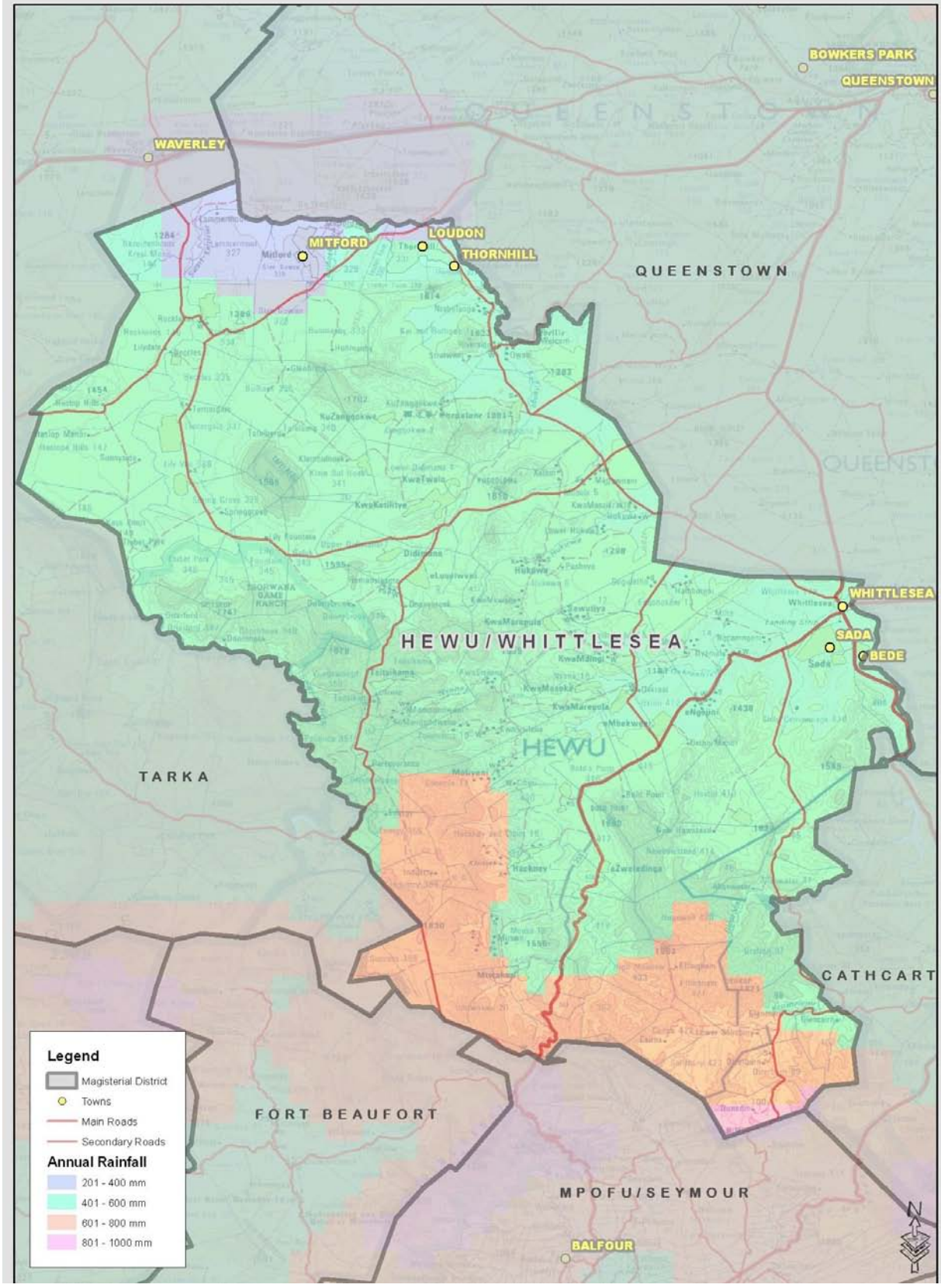
Table 3.1: Monthly average rainfall for Whittlesea area for the last 22 years.

MONTH	RAINFALL (Millimetres)
January	79.0
February	86.6
March	74.2
April	34.0
May	17.5
June	13.0
July	7.9
August	8.6
September	32.0
October	34.3
November	34.0
December	64.8

Source: Whittlesea weather station 2006

According to Table 3.1, the highest rainfall occurred from October to April with the highest rainfall in February (86.6 mm) and the lowest in July (7.9 mm). This is a clear indication that Hewu is a summer rainfall area.

Figure 3.2 Hewu research area Annual Rainfall



3.3.2 Temperature

The community farms do not have a weather station. Although the climate varies markedly over short distance, the nearest weather station is in Whittlesea with a latitude of 32˚C 10' and longitude of 26˚ C 00'. The altitude of the town is 1052 meters above sea level. The research area is about 15 kilometres from Whittlesea.

Frost occurs usually at the beginning of autumn. Temperatures can fall to minus 6˚celsius in winter and can rise to extremes of 38˚celsius in summer. The average daily maximum temperature for January is 29˚celsius and 18˚celsius during July while the average minimum temperature in January is 14.5˚celsius and for July 2.6˚celsius (Whittlesea weather station, 2008). Figure 3.3 illustrates the annual maximum temperature and figure 3.4 illustrates the annual minimum temperature.

3.3.3 Vegetation

There are 7 different veldt types represented in the Hewu area (Figure 3.5):

- Amathole Mistbelt Grassland
- Amathole Montane Grassland
- Eastern Temperate Freshwater Wetlands
- Karoo Escarpment Grassland
- Queenstown Thornveld
- Southern Mistbelt Forest
- Tarkastad Montane Shrubland

Figure 3.3 Hewu research area Annual Maximum Temperature

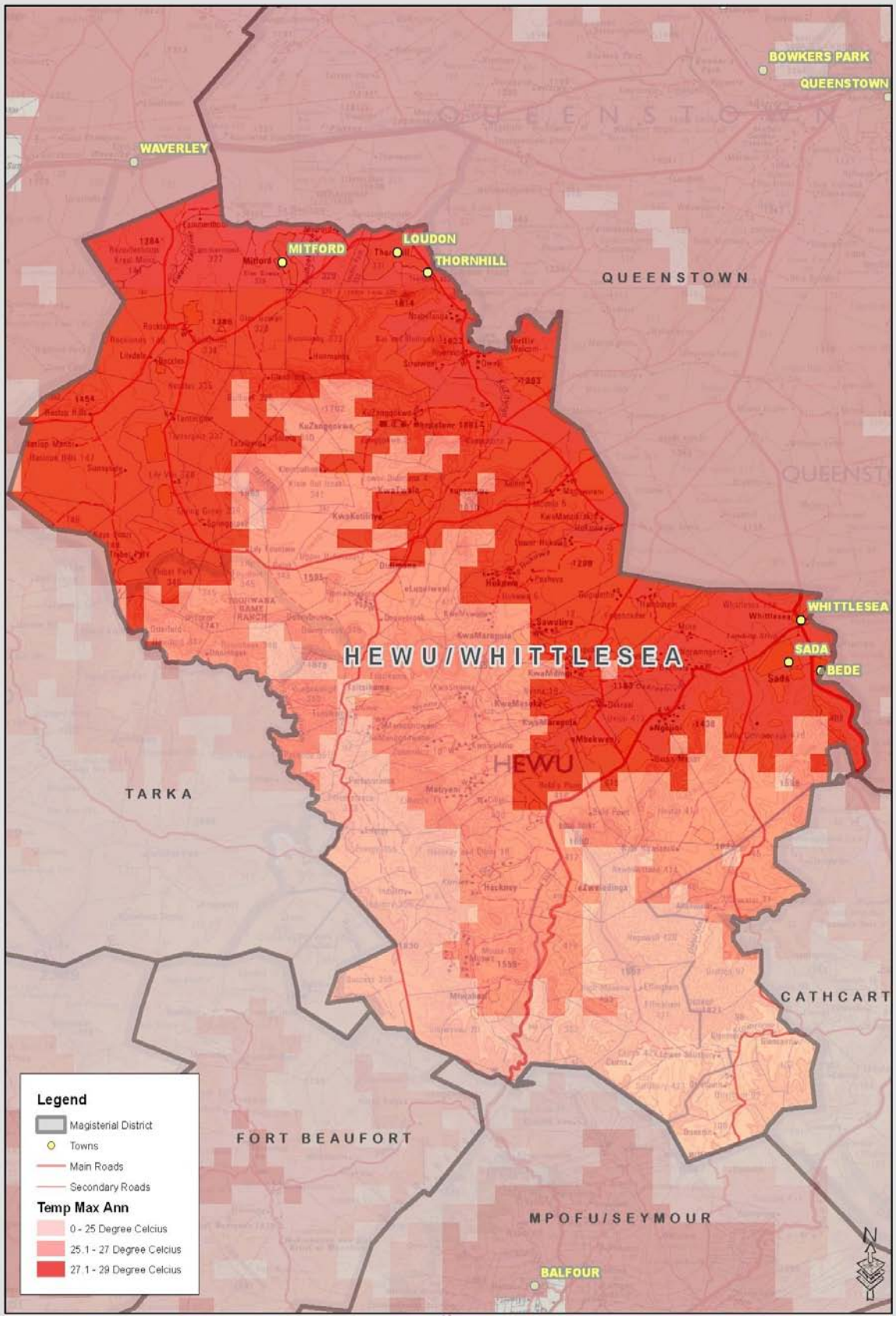


Figure 3.4 Hewu research area Annual Minimum Temperature

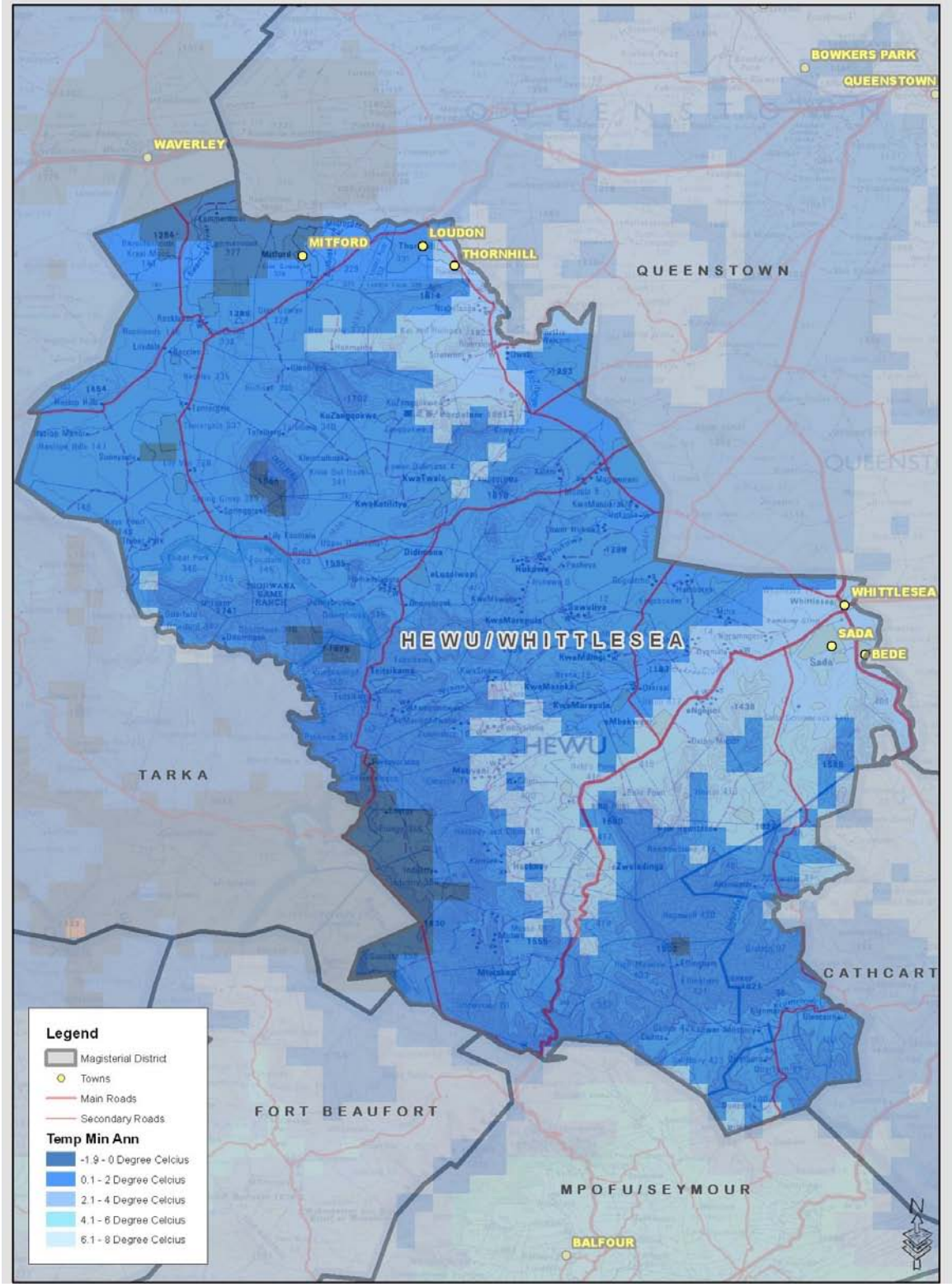
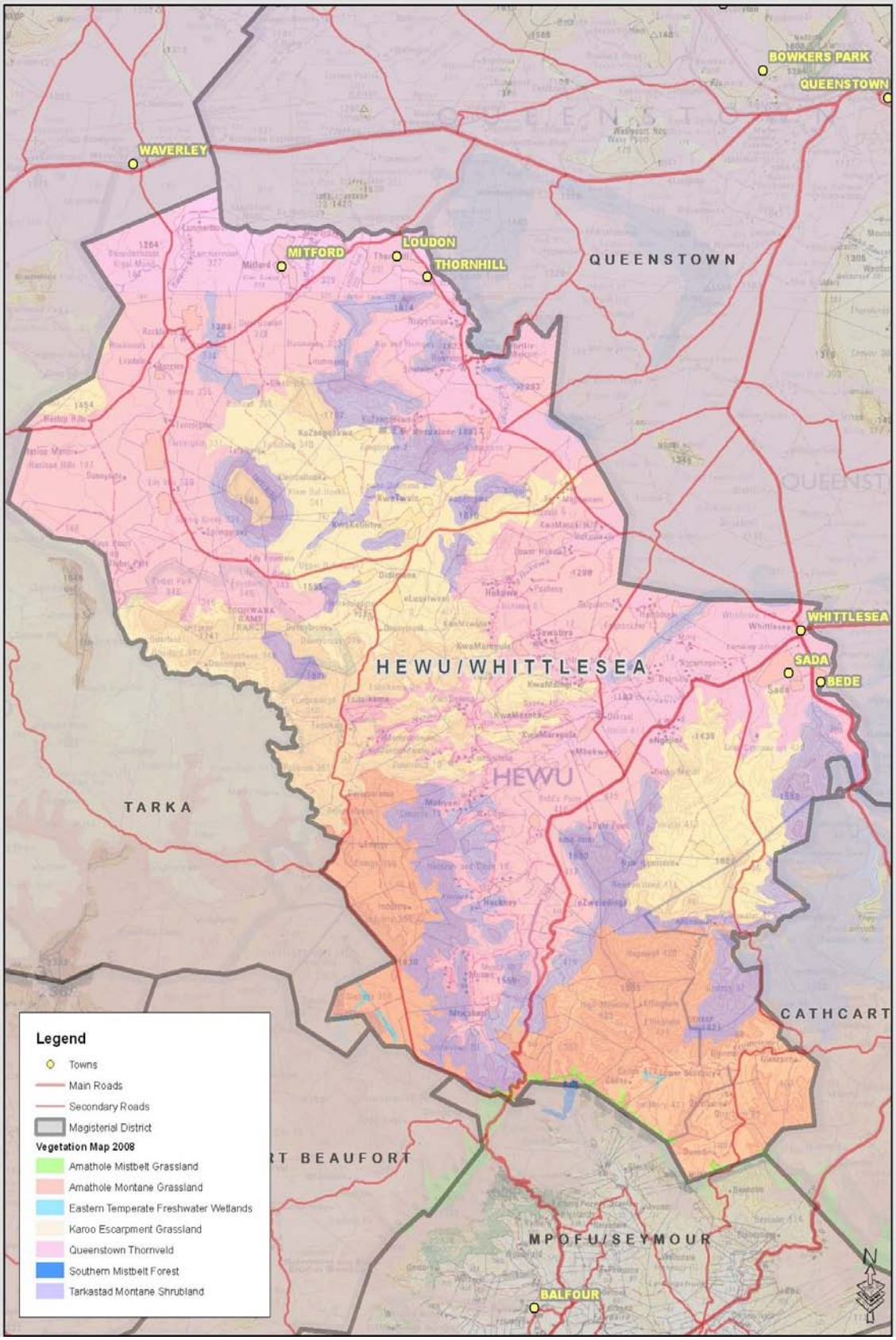


Figure 3.5 Hewu research area Vegetation Map



3.4 RESEARCH PROBLEM

The lack of management information systems for communal farmers results into ineffective communal farming in the Hewu area.

3.4.1 Production

Wool production is the major source of income for the Hewu farmers. In the communal areas of the Eastern Cape, wool produced per sheep is between 2kg and 3kg. That is far below the wool production of the commercial farmers of the Eastern Cape who are producing between 4kg to 5kg per sheep at an average growing period of 12 months (Cape Wools SA, 2006/2007).

The quality of wool produced by communal farmers is not good. The possible reasons for poor wool production are:

- The poor quality of rams used.
- The poor quality of breeding ewes.
- Inbreeding practices by communal farmers.
- The lack of good quality rams to purchase.
- The poor quality wool produced by communal farmers is also caused by the unavailability of good quality feed during winter months.
- In general, quality of wool produced by communal farmers is not meeting the standards set by the NWGA of SA.

3.4.2 Reproduction

Reproduction is a problem of communal farms. Reasonable lambing percentages can be seen on the communal farms. Many lambs died few weeks after birth, which resulted in very low weaning percentages. Low weaning percentages affect the selection of replacement ewes and the sale of surplus livestock negatively. High death percentage of lambs after birth is mainly caused by lambing during the winter months of the year. Apart from the cold spells during the winter months, there is also no good quality grazing available.

3.4.3 Management

The limited number of young ewes results in communal farmers being unable to select young ewes for replacement purposes. All young ewe lambs are kept for the replacement of old ewes. This is a problem as it transfers poor traits from one generation to another. This can also be seen as negatively impacting on wool production and the size of the animals. The other aspect causing high death percentages of lambs is due to a lack of farm management skills.

Mortalities of lambs among the communal farmers are high due to:

- Lambing during winter months when grazing is limited and the weather is very cold.
- Farmers on the communal farm are letting nature takes its course when it comes to mating. Mating of ewes is not controlled and managed by farmers.
- Predators are causing major problems in the farming communities.

3.5 RESEARCH METHOD

The research method consisted of a structured questionnaire completed by way of an interview.

3.5.1 Research questionnaire

The questionnaire (Annexure A) consisted of 65 questions and 10 categories of indicators (sections) namely:

A. General
B. Production
C. Selection practices
D. Mating and reproduction
E. Purchasing of rams
F. Animal health
G. Feeding
H. Lamb Mortalities
I. Fecundity (Fertility)
J. Marketing

The wording has been carefully formulated to eliminate any possible ambiguities. The space provided on the questionnaire for recording information, were arranged appropriately so that the data would be readily accessible for analysis. In order to satisfy the objectives of the study, a questionnaire was developed for use among farmers on communal land. The questionnaire contains structured questions, making provision for farmer comments by means of open ended questions and encouraging respondents to express their own perception in their own words.

3.5.2 Selection of indicators

It is possible to classify and use some indicators either as continuous or categorical indicators, depending on how they were approached or measured. An example for instance, is the number of extension visits to farmers on communal farms area per year, which can be measured and classified as a continuous indicator, or as a categorical indicator if the researcher is only interested in whether the farmers received extension visits or not.

3.5.3 Interviews

Structured interviews were held with the 70 Hewu participants each completing the questionnaire. Such visits were usually preceded by discussion with the local Extension Officers, to win their understanding, trust and support. All questionnaires were filled in by the interviewer. In general, the procedure followed when conducting the interviews was aimed at facilitating the gathering of ideas, viewpoints, opinions, suggestions and comments from the farmers on wool production on communal land. Special care was taken during the interview sessions to ensure that respondents understood the issues.

3.5.4 Fieldwork

It is important that the researcher visits the research area regularly to obtain first hand knowledge about the participants and the area. There are several

advantages to the observational fieldwork conducted for evaluation purposes in this study (Jordaan, 1997:84-85)

- It provides a better understanding of the context within which the study activities take place.
- It provides important information participants may ignore or omit, willingly or unwillingly, in an interview.
- It permits the researcher to present a more comprehensive view of the study.
- It facilitates understanding and interpretation of the study area by providing personal knowledge and direct experience.

3.5.5 Data capturing

All the respondents interviewed were farming on communal farms. The researcher interviewed 70 respondents. The interviews were conducted with individual farmers at their respective farming locations. The questionnaires were not handed out to the farmers, but were completed by the interviewer. Although the questionnaire was compiled in English, the language used in the interviews was Xhosa. The researcher personally conducted all interviews, and the completion time varied between 100 and 120 minutes per questionnaire. In general, good co-operation was obtained from the communal farmers.

3.6 CONCLUSION

In this chapter the research methodology was discussed. The research area of Hewu is situated between Queenstown and Whittlesea in the Eastern Cape Province. It is a summer rainfall area, hot summers and very cold winters. The research problem to be addressed refers to a lack of management systems for communal farmers resulting into ineffective communal farming. The main sub problems identified for research purposes were wool production, reproduction and management information. A structured questionnaire was used to gather the information.

Chapter four will cover the research results.

CHAPTER 4
RESULTS

4.1 INTRODUCTION

The presentation of the results will be tabled in this chapter. This chapter is concerned with the actual findings of the research.

4.2 BACKGROUND

The results from the Hewu area give a close overview of the agricultural situation. The 70 farmers that were questioned indicated how they farm. From the results it is quite obvious that the area is communal land where the farming practices are unique.

4.3 THE RESEARCH RESULTS ARE PRESENTED IN THE FOLLOWING CATEGORIES:

- General information
- Production
- Selection practices
- Mating and reproduction
- Purchasing of rams
- Animal health
- Feeding
- Lamb mortalities
- Fecundity (Fertility: Ability to produce multiples)
- Marketing

4.4 GENERAL INFORMATION

4.4.1 Magisterial district.

All the farmers are in the Hewu area situated between Queenstown and Whittlesea.

4.4.2 Sheep breeds.

The farmers are farming mainly with pure bred Merino and Döhne Merino wool sheep.

4.4.3 Cross breeding on cull ewes.

Cross breeding only occur when there are no other rams available. Cross breeding is not part of their breeding practices.

4.4.4 Recordkeeping.

Detail record keeping for economic purposes is extremely difficult in a communal area. It is usually just the number of animals that are regarded as important.

The following recordkeeping options were presented:

A. Keep complete records of the production performance of all the sheep in the flock
B. Keep record of number of ewes mated as well as lambing and weaning percentages
C. Keep figures and know how many lambs have been weaned
D. Keep figures, but no records

The last option (D) was used by all 70 of the farmers in the research area.

4.4.5 Sources of information.

The following options as sources of information were available:

A. Department of Agriculture
B. BKB and or CMW agents

C. Fellow farmers

D. Wool farmer news

E. Grootfontein Agricultural College

F. Other (Name them)

All the farmers chose options A and C. Their most important sources of information are the Department of Agriculture and their fellow farmers.

4.4.6 Problems affecting efficiency of sheep farming.

The respondents had to choose the three most important problems. The following results were obtained:

Table 4.1: Problems affecting the efficiency of sheep farming

Problems	Number of responses	Percentage (%)
A	**23**	**32.86**
B	**70**	**100.00**
C	**47**	**67.14**
D	**0**	**0**
E	**0**	**0**
F	**58**	**82.86**
G	**12**	**17.14**
H	**0**	**0**
TOTAL	**210**	**300.00**
N = 70		
n = 70		

Where:

A = Predators/vermin

B = Poor veldt conditions

C = Theft

D = Labour

E = Straying problems (Do not stay in camps)

F = Management problems in the lambing season

G = Diseases and disease control

H = Other

N = Population size

n = Number of respondents

From Table 4.1 it is clear that poor veldt conditions (Option B) is the major problem to all the farmers (100.00%) followed by management problems in the lambing season (Option F – 82.86%) and Theft (Option C – 67.14%).

4.5 PRODUCTION

4.5.1 Shearing intervals

In the communal area all the sheep are shorn during the same period. In the Hewu area, the entire sheep flock is shorn every 12 months.

4.5.2 Months of shearing

The community of Hewu shears during October of every year.

4.5.3 Total amount of wool produced by the different wool producers

A total amount of 17 217 kg of wool is produced by 59 wool producers in the Hewu area. The composition of the wool producers contributing to the total wool clip is illustrated in Table 4.2.

Table 4.2: The distribution of the wool producers in the Hewu area.

Weight (kg)	Group Number	Number of responses	Percentage (%)
2.1 - 199.99	**1**	**30**	**50.85**
200 - 299.99	**2**	**13**	**22.03**
300 - 399.99	**3**	**6**	**10.17**
400 - 499.99	**4**	**3**	**5.08**
≥500	**5**	**7**	**11.87**
TOTAL		**59**	**100.00**
N = 70			
N = 59			

Where:

N = Population size

n = Number of respondents

Group 5 (7 producers) contributes the largest amount of wool (5478 kg) representing 11.87% of the producers. Group 1 (30 producers) contributes less than 199.99 kg of wool representing 50.85% of the producers.

4.5.4 Fineness of the wool clip

Being a communal area, the wool is offered for sale in the name of the shearing shed. A split sheet is prepared to indicate the contribution of each individual. The clip averaged a fineness of 19.1 – 20 micron.

4.5.5 Number of sheep shorn

The total number of sheep shorn is shown in Table 4.3.

Table 4.3: The total number of sheep shorn (October 2006)

Category	Numbers of sheep	Percentage (%)
Lambs	**0**	**0**
Weaned lambs	**599**	**7.55**
Young ewes	**907**	**11.44**
Young wethers	**565**	**7.13**
Adult ewes	**4547**	**57.33**
Adult wethers	**1151**	**14.51**
Adult rams	**162**	**2.04**
TOTAL	**7931**	**100.00**
N = 70		
n = 70		

Where:

N = Population size

n = Number of respondents

Table 4.3 illustrates that the total number of sheep shorn is 7931. The adult animals (5860) represent 73.98% of the total flock. The ram ewe ratio is 3.56%. The total amount of wool shorn is 17 217kg as discussed in paragraph 4.5.3 that results in 2.17kg of wool per animal per year.

4.6 SELECTION PRACTISES

4.6.1 Important characteristics for the selection of sheep

The respondents had to choose the three most important characteristics. The most important characteristics a sheep farmer should bear in mind when selecting wool sheep are represented in Table 4.4.

Table 4.4: The most important characteristics for the selection of sheep.

Characteristics	Number of responses	Percentage (%)
A	**61**	**87.14**
B	**70**	**100.00**
C	**45**	**64.29**
D	**27**	**38.57**
E	**0**	**0**
F	**7**	**10.00**
G	**0**	**0**
TOTAL	**210**	**300.00**
N = 70		
n = 70		

Where:

A = Conformation
B = Size (Body weight)
C = Fertility
D = Mothering characteristics
E = Good developed sexual organs
F = Healthy udder
G = Other
N = Population size
n = Number of respondents

From Table 4.4 it is quite clear that the size (body weight) of the animal is the most important characteristic to all the farmers (100.00%) followed by conformation (87.14%) and fertility (64.29%).

4.6.2 Important wool characteristics when selecting rams

The respondents had to choose the three most important wool characteristics when selecting rams. The results are demonstrated in Table 4.5.

Table 4.5: The most important wool characteristics for the selection of rams.

Characteristics	Number of responses	Percentage (%)
A	23	32.86
B	56	80.00
C	70	100.00
D	48	68.57
E	13	18.57
F	0	0
TOTAL	210	300.00
N = 70		
n = 70		

Where:

A = Fineness

B = Length

C = Quality (Definition of crimp, the handle etc)

D = Staple formation

E = Colour

F = Other

N = Population size

n = Number of respondents

From Table 4.5 it is obvious that the quality of the wool is the most important wool characteristic of all the farmers (100.00%). It is followed by length (80.00%) and staple formation (68.57%).

4.6.3 Important wool characteristics when selecting ewes

The respondents had to choose the three most important wool characteristics when selecting ewes. The results are demonstrated in Table 4.6.

Table 4.6: The most important wool characteristics for the selection of ewes.

Characteristics	Number of responses	Percentage (%)
A	70	100.00
B	63	90.00
C	35	50.00
D	42	60.00
E	0	0
F	0	0
TOTAL	210	300.00
N = 70		
n = 70		

Where:

A = Fineness

B = Length

C = Quality (Definition of crimp, the handle etc)

D = Staple formation

E = Colour

F = Other

N = Population size

n = Number of respondents

Table 4.6 illustrates that fineness is the most important wool characteristic when the farmers are selecting ewes (100.00%), followed by length (90.00%) and staple formation (60.00%).

4.6.4 Measures to ensure that ewes which did not take were effectively culled from the flock

The following measures to ensure that ewes which did not take were effectively culled from the flock were presented to the respondents:

A. Keep full production records and cull ewes accordingly

B. Mark all ewes that did not take and cull ewes accordingly

C. Mark only some of the ewes that did not take for slaughtering

D. Do not cull ewes that did not take because ewes were not identified

Option D was selected because the farmers did not identify the ewes that did not lamb. The other reason mentioned was that because of the small numbers of animals, the farmers cannot afford to cull the ewes.

4.6.5 Methods to select against weak/poor mothering characteristics

The proposed methods to follow for selection against weak mothering characteristics were as follows:

A. Use strict supervision during the lambing season and mark all ewes with udder defects and those which reject lambs and then cull the lambs and ewes.

B. Use strict supervision during the lambing season and mark all ewes with udder defects and those which reject lambs and then cull only the ewe.

C. Mark only ewes with obvious udder defects and ewes which reject lambs and cull the ewe.

D. Mark only some of the ewes whose lambs do not flourish or which die and cull the ewe.

E. Do not cull for weak or mothering characteristics.

The Hewu farmers selected option E. They do not cull for weak mothering characteristics. The reason for this is the fact that the numbers of the ewes are too small. The effected ewes are also not marked.

4.6.6 Methods to identify multiple ewes and relevant lambs

The following methods were tabled to identify multiple ewes and the relevant lambs:

A. Identify and mark all multiple ewes as well as their lambs under strict supervision for future identification.

B. Keep ewes with multiple lambs separate without marking them for future identification.

C. Take note of the multiple births and keep some of the multiple ewes (triplets) and her lambs separate.

D. Do not mark multiple ewes and their lambs for identification.

Option D applies here for the Hewu farmers. No ewes or lambs are marked by the farmers. Some of the farmers own sheep, but are not involved with the management of the sheep.

4.6.7 Methods to select young ewes for replacement.

The following options as sources of information were available:

A. Farmer himself
B. BKB or CMW
C. Fellow farmer
D. Farmer and BKB/CMW
E. Other (name)

Farmers are selecting young ewes themselves. Option A applies here. Selection of younger ewes is not very important for communal farmers. The reason for this is the lack of information and the small size of the flock.

4.6.8 Methods to determine whether the rams used were fertile.

The following options as sources of information were available:

A. Had clinical fertility test done in all rams just before mating season and had their reproductive organs examined by a veterinarian.
B. Had reproductive organs examined by a veterinarian just before mating season
C. Examined reproductive organs by yourself just before mating season
D. Did not do anything

The Hewu farmers chose option D. They do not test rams for fertility. The reason is that they believe the ram is naturally fertile.

4.7 MATING AND REPRODUCTION

4.7.1 Number of rams used per 100 ewes.

As all farmers in the Hewu area farm with small flocks of sheep, each farmer tries to keep 2 rams per 100 ewes. The grazing is common for all the farmers and the rams will serve all available ewes.

4.7.2 Duration of mating period.

In the Hewu area the rams are always with the ewes for the total year (52 weeks). The reason is that it is difficult to separate rams from ewes due to no proper camping systems.

4.7.3 Types of mating practice.

The following methods were tabled as sources of information:

A. Rams are continuously with the ewes
B. Mates once a year
C. Mates three times in two years
D. Artificial Insemination (AI)
E. Other

In this question all farmers chose option A. The rams are thus continuously with the ewes due to the lack of separated camps.

4.7.4 Two months of the year best for mating in the Hewu area.

Hewu farmers chose December and January as the two best months for mating. The reasons are that during these two months enough grazing is available and the ewes and rams tend to be in a good condition.

4.7.5 Methods of mating young ewes.

Hewu farmers are not mating young ewes separately due to a lack of farming infrastructure and information.

4.7.6 Do you use teaser rams before the mating season?

The farmers in the Hewu area do not use teaser rams before the mating season. The reason is that they do not understand the concept of using teaser rams.

4.7.7 Number of ewes in the breeding flock excluding ewe lambs.

The total number of breeding ewes in the Hewu area is 4 622 ewes.

4.7.8 Number of ewes mated in the past season.

All the ewes (4 622) were mated in the previous season in the Hewu area.

4.7.9 Number of ewes which did not take a ram.

According to the farmers in the Hewu area 227 ewes did not take ram in the past mating season. The reason is that some of the ewes were old and some were not in a good condition.

4.7.10 Number of ewes aborted.

The total number of ewes aborted in the Hewu area were 50.

4.7.11 Number of lambs born alive.

During the past season 4384 lambs were born alive. For the season these farmers had a high lambing percentage of 94.85%.

- **Lambing percentage : $\frac{\text{Number of lambs born alive}}{\text{Number of ewes mated}}$**

$$= \frac{4\,384}{4\,622}$$

$$= 94.85\%$$

4.7.12 Number of lambs weaned

There were only 797 lambs weaned. Excessive losses took place (3587 lambs lost/died).

- **Weaning percentage: Number of lambs weaned**

  Number of lambs born alive

  = 797

  4 384

  = 18.18%

This formula refers to the management performance of the farmers. The farmers managed to wean only 797 lambs from the 4 384 lambs born alive (18.18%). This formula also refers to the survival rate of the lambs.

- **Weaning percentage: Number of lambs weaned**

  Number of ewes mated

  = 797

  4 622

  = 17.24%

This formula refers to the reproductive efficiency of the ewes. Only 17.24% of the ewes managed to wean a lamb. It means further on that 82.76% of the ewes did not wean a lamb. If there were multiples, then the reproductive rate of the ewes is actually even worse.

4.7.13 Number of lambs died from birth to weaning (not weaned)

The total number of lambs dead was 3587. It is a result from bad veldt conditions, cold spells, predators and management.

- **Percentage lambs died: Number of lambs died**

  Number of lambs born alive

  = 3 587

  4 384

  = 81.82 %

4.7.14 Lambing system practice

The following options as sources of information were available:

A. Kraal method with small pens for multiples.
B. Pastures
C. Small flock in small camp
D. Large flock in large camp
E. Drifting system
F. Other

All the farmers chose option D. The large flock in large camp as their lambing system for the area. Large flocks lambing in large camps are thus the lambing management practice followed by the Hewu farmers.

4.8 PURCHASE OF RAMS

4.8.1 Have you ever bought rams at auctions?

The farmers from the Hewu area have never bought rams at auctions. The reason is that the former Ciskei government farmers were supplied with rams. Some rams were bought from fellow farmers or direct from ram breeders out of hand. Formal auctions do not exist in the Hewu communal area.

4.8.2 Problems with purchasing of rams.

All farmers in the Hewu area had problems with purchased rams. The main reason is the lack of contact with proper ram breeders. The availability of good breeding material is a problem.

4.8.3 Identify the problems according to the items below.

The respondents were asked to choose the two most important problems experienced from newly bought rams.

Table 4.7: Problems with newly bought rams

Problems	Number of responses	Percentage (%)
A	48	72.73
B	30	45.45
C	0	0.00
D	34	51.52
E	20	30.30
F	0	0.00
TOTAL	132	200.00
N = 70		
n = 66		

Where:

A = Rams have problems adapting to veldt conditions

B = Some rams die shortly after they were bought

C = Some rams do not have servicing capabilities

D = Some rams do not service the ewes in the first mating season after purchased

E = Some rams are sterile

F = Other (Name them)

N = Population size

n = Number of respondents

Table 4.7 illustrates that the most important problem with newly bought rams is to adapt to veldt conditions (72.73%), followed by some rams that do not service the ewes in the first mating season after being purchased (51.52%) and then some rams die shortly after they were bought (45.45%).

4.8.4 Purchasing of flock rams at veldt ram auctions

If the farmers had the opportunity, they would prefer to buy rams at veldt ram auctions. There are no veldt ram auctions in the Hewu area.

4.9 ANIMAL HEALTH

4.9.1 Against which of the following diseases do you inoculate sheep?

The respondents had to choose the three most important diseases against which they inoculate their sheep. The following results were obtained.

Table 4.8: Diseases sheep are inoculated against

Diseases	Number of responses	Percentage (%)
A	**70**	**100.00**
B	**60**	**85.71**
C	**45**	**64.29**
D	**0**	**0**
E	**0**	**0**
F	**0**	**0**
G	**35**	**50.00**
H	**0**	**0**
I	**0**	**0**
TOTAL	**210**	**300.00**
N = 70		
n = 70		

Where:

A = Pulpy kidney

B = Blue tongue

C = Enzootic abortion

D = Blue udder

E = Gas gangrene (C.Septicum)

F = Orf (Scabby mouth)

G = Dysentery

H = Other (Name)

I = Do not inoculate at all

N = Population size

n = Number of respondents

Table 4.8 Illustrates that pulpy kidney is the most important disease affecting efficiency of sheep farming (100.00%) followed by blue tongue (85.71%) and enzootic abortion (64.29%).

4.9.2. The three diseases that usually cause the most problems.

The respondents had to choose the three most important diseases that normally cause the most problems in the area. The following results were obtained:

Table 4.9: Diseases normally causing problems

Diseases	Number of responses	Percentage (%)
A	**70**	**100.00**
B	**57**	**81.43**
C	**11**	**15.71**
D	**49**	**70.00**
E	**0**	**0**
F	**0**	**0**
G	**23**	**32.86**
H	**0**	**0**
TOTAL	**210**	**300.00**
N = 70		
n = 70		

Where:

A = Pulpy kidney
B = Blue tongue
C = Enzootic abortion
D = Blue udder
E = Gas gangrene (C.Septicum)
F = Orf (Scabby mouth)
G = Dysentery
H = Other (Name)
N = Population size
n = Number of respondents

Table 4.9 illustrates that pulpy kidney is the most important disease (100.00%) followed by blue tongue (81.43%) and blue udder (70.00%).

4.9.3. External parasites affecting efficiency of sheep farming

The respondents had to choose the most important external parasites affecting efficiency of sheep farming. The following results were obtained.

Table 4.10: External parasites affecting efficiency of sheep farming

External parasites	Number of responses	Percentage (%)
A	**0**	**0**
B	**20**	**28.57**
C	**1**	**1.43**
D	**2**	**2.86**
E	**23**	**32.86**
F	**24**	**34.28**
G	**0**	**0**
TOTAL	**70**	**100.00**
N = 70		
n = 70		

Where:

A = Australian itch mites

B = Ticks (“normal ticks”)

C = “Bont” leg tick

D = Sheep blowfly

E = Karoo paralysis tick

F = Sheep scab

G = Do not dip at all

N = Population size

n = Number of respondents

Table 4.10 illustrates that sheep scab is the most important external parasites (34.28%), followed by Karoo paralysis tick (32.86%) and Ticks (“normal ticks”) with (28.57%).

4.9.4. How regularly do you dip your sheep per year (as well as pour on remedies)?

In the Hewu communal area, all the sheep are dipped 4 times a year. The farmers follow the dipping programme from the government that also provides the dip.

4.9.5. Internal parasites affecting the efficiency of sheep farming

The respondents had to choose the most important internal parasites affecting efficiency of sheep farming. The following results were obtained.

Table 4.11: Internal parasites affecting efficiency of sheep farming

Internal parasites	Number of responses	Percentage (%)
A	**23**	**32.86**
B	**25**	**35.71**
C	**6**	**8.57**
D	**0**	**0**
E	**16**	**22.86**
F	**0**	**0**
G	**0**	**0**
TOTAL	**70**	**100.00**
N = 70		
n = 70		

Where:

A = Roundworm

B = Tapeworm

C = Liver fluke

D = Conical fluke

E = Nasal worm

F = Other (Name)

G = Do not dose at all

N = Population size

n = Number of respondents

Table 4.11 illustrates that the three most important internal parasites are tapeworm (35.71%), followed by roundworm (32.86%) and nasal worm (22.86%).

4.9.6 How often do you dose your sheep per year?

All the farmers in the Hewu area are dosing twice per year. Once during the summer months and once during the early winter.

4.10 FEEDING

4.10.1 Flushing of ewes.

All the farmers in the communal farms are not flushing ewes before mating. They do not understand the concept of flushing the ewes. There is a lack of information.

4.10.2 Methods of supplementary feeding ewes in the late stage of pregnancy.

The communal farmers do not use supplementary feed for their ewes during the late stage of pregnancy. There is a lack of knowledge and information. For them grazing is always the source of feed irrespective of the condition of the veldt.

4.10.3 Supplementary feeding of lactating ewes

During lambing season only 41 (58.57%) of the 70 farmers make use of supplementary feed for the lactating ewes.

4.10.4 Types of supplementary feeding of lactating ewes

The types of feed used for supplementary feeding are shown in Table 4.12

Table 4.12: Types of supplementary feed for lactating ewes

Feed	Number of responses	Percentage (%)
A	0	0
B	0	0
C	0	0
D	0	0
E	12	29.27
F	29	70.73
G	0	0
H	0	0
TOTAL	41	100.00
N = 70		
n = 41		

Where:

A = Chocolate maize
B = Maize
C = Lucerne
D = Feed pellets
E = Rested veldt
F = Pastures
G = Licks
H = Other (Name)
N = Population size
n = Number of respondents

Table 4.12 illustrates that 70.73% of the farmers use pastures as supplementary feeding for the lactating ewes while 29.27% uses rested veldt if there is rested veldt available.

4.11 LAMB MORTALITIES

4.11.1 The three most important causes of lamb losses in the last year.

The respondents had to choose the three most important causes of lamb losses in the last season. The following results were obtained.

Table 4.13: The three most important causes of lamb losses

Causes of lamb losses	Number of responses	Percentage (%)
A	45	64.29
B	70	100.00
C	50	71.43
D	15	21.43
E	0	0
F	30	42.85
G	0	0
TOTAL	210	300.00
N = 70		
n = 70		

Where:

A = Predators/Vermin

B = Poor veldt condition

C = Poor mothering characteristics

D = Multiples of which some lambs are too weak and too difficult to cope with for the ewe and the supervisor

E = Ewes stray and becomes separated from lambs

F = Coccidiosis

G = Other (Name)

N = Population size

n = Number of respondents

Table 4.13 illustrates that poor veldt condition is the most important cause of lamb losses (100.00%), followed by poor mothering characteristics with 71.43% and predators/vermin with 64.29%.

4.11.2 What percentage stillborn lambs have ewes had in the past lambing season?

None. There were no stillborn lambs in the Hewu area.

4.11.3 Percentage of losses occurred from birth to weaning in the past lambing season.

During the past lambing season 9 farmers (12.86%) had lamb losses of 13% from birth to weaning and 61 farmers (87.14%) had lamb losses of 87% from birth to weaning. The reason of the high percentage of losses was mainly poor veldt conditions and the wrong lambing seasons.

4.11.4 Percentage losses from weaning to 12 months

All communal farmers had zero percent losses from weaning to 12 months. The reason is that very few lambs were weaned therefore management was easy.

4.12 FECUNDITY (FERTILITY)

4.12.1 Total weaning percentage for the area

The weaning percentage of the Hewu area was 18.18% and 17.24% (See paragraphs 4.7.12 and 4.7.13).

4.12.2 Percentage of ewes lambed twins in the past season

For all the farmers of the Hewu area only one percent of twins were born in the past season. The reason was that the ewes were not properly managed before and during the mating season.

4.12.3 Weaning percentage farmers are aiming for

All the farmers in the Hewu area are aiming for a 100% weaning percentage.

4.12.4 Do you welcome if ewes give birth to twin lambs?

For this question all the communal farmers said no. They do not want twins because twins are weak and require more attention.

4.13. MARKETING

4.13.1 At what age do you market slaughter lambs?

The communal farmers are not selling lambs. They do not have information regarding marketing or the selling of lambs.

4.13.2 Average weight of slaughter lambs during marketing

The communal farmers are not weighing lambs because they do not have equipment.

4.13.3 Marketing of sheep.

All the farmers are selling wethers, culled sheep and old animals.

4.13.4 Market for sheep.

They are selling the animals to the local market.

4.14 CONCLUSION

The results presented in this chapter give a clear indication of the farm management practices. Although the Hewu area is a communal area, the results indicated how the farm management process works. The very low weaning percentages indicated major problems to be solved. The lamb mortalities are far too high. A lot of information is available and need to be discussed and introduced to the farmers. It is important to ensure that specific problems need to be addressed to complete the important research that was done.

CHAPTER 5

DISCUSSION OF RESULTS

5.1 INTRODUCTION

This chapter refers to the discussion of the results. The results will be discussed under the categories of general information, production, selection practices, mating and reproduction, ram purchases, animal health, feeding, lamb mortalities, fecundity (fertility) and marketing.

5.2 GENERAL

5.2.1 Cross breeding.

The farmers are mainly farming with pure bred Merino sheep and pure bred Döhne Merino sheep. Cross breeding is not part of their breeding practices.

5.2.2 Record keeping.

Detail record keeping for economic purposes is extremely difficult in a communal area. It is usually just the number of animals that are regarded as important. Option D (Keep figures but no records) was used by all 70 of the farmers in the research area. Figures refer to the numbers of animals where records include all the other information like wool and meat prices received, progeny of the ewe or ram, important dates, reproduction data, wool production information etc. According to Gordijn and Whiteheads (1995) and Venter (1997), it is essential that farmers keep adequate records. Keeping records is perhaps one of the most important barometers of managerial skill. It is difficult for a farmer to manage a farm without keeping proper farming records (Nel, 1998:20).

5.2.3 Sources of information.

Farmers in the area of investigation chooses options A (Department of Agriculture) and C (fellow farmers) as they sources of information. The Department of Agriculture is always considered as a very important source of information. Currently farmers experience that there are not enough extension officers from the Department of Agriculture to assist them at curtail times.

5.2.4 Most important problems affecting sheep farmers.

- Option B (Poor veldt conditions) was chosen as the most important problem affecting the efficiency of sheep in the area (Table 4.1).
- Option F (Management problems in the lambing season) was identified as the second most important problem.
- Option C (Theft) was identified as the third most important problem.

Botha and Stevens (1999:28) reported that sound management of environmental resources is of the utmost importance. Research, education and practical training in general have to take cognizance of and develop more participatory approaches to extension. Scogings *et. al.* (1999:2-11) further argued that "…. in order to achieve sustainable agriculture in communal rangelands, land use must be ecologically sound, economically viable, socially acceptable and politically supported.'' A team of researchers from Plaas (1999) concluded that veldt must be looked after well so that the grass and soil are not damaged and animals can get enough food.

5.3 PRODUCTION

5.3.1 Shearing intervals.

In communal areas all the sheep are usually shorn during the same period. In the Hewu area, the entire sheep flock is shorn every 12 months. The sheep are shorn by the farmers themselves that was trained in sheep

shearing. They are paid by their fellow farmers to do the shearing of the sheep. The blade shearing (hand shearing) method is used for shearing the sheep.

5.3.2 Months during which shearing takes place.

In the Hewu area sheep are shorn during October every year. According to the farmers, the late spring period is suitable for shearing because of warm weather and good veldt conditions.

5.3.3 Wool production.

Wool production is divided into five groups (Table 4.2).

- Group 5 (7 producers – 11.87% of producers) contributes the largest amount of wool (5478 kg) representing 31.82% of the total wool clip.
- Group 1 (30 producers – 50.85% of producers) contributes the second largest amount of wool (4983kg) representing 28.94% of the total wool clip.

Group 1 and group 5 contributed 60.76% of the wool produced in the Hewu area. These two groups dominate the wool farming of the area (Table 4.2). The average amount of wool shorn per sheep is 2.17kg.

5.3.4 Fineness of the wool clip.

Being a communal area, the wool is offered for sale in the name of the Hewu shearing shed. A split sheet is prepared to indicate the contribution of each individual. The clip averages a fineness of 19.1-20 micron.

5.3.5 Number of sheep shorn.

The total number of sheep in the Hewu area is 7931. The adult animals (5860) represent 73.98% of the total flock. The ram ewe ratio is 3.56%. The total amount of wool shorn is 17 217 kg (Paragraph 4.5.3) resulting in 2.17kg of wool shorn per animal per year.

5.4 SELECTION PRACTICES

5.4.1 The most important characteristics for the selection of animals.

In this category no distinction was made between the rams and ewes. The respondents had to choose the three most important characteristics when selecting sheep. The following characteristics were regarded as important (Table 4.4):

- Option B (Size: Body weight) was chosen as the most important characteristic for the selection of ewes.
- Option A (Conformation) was the second most important characteristic for the selection of ewes.
- Option C (Fertility) was the third most important characteristic for the selection of ewes.

It is quite interesting that the farmers regard the size and the build of the animals more important than fertility. The main objective for farming with ewes is for reproduction purposes. Wool production is the secondary objective. The primary objective for ewes is to produce lambs.

5.4.2 The most important characteristics for the selection of wool.

5.4.2.1 Rams.

The following wool characteristics were regarded as important for the selection of rams (Table 4.5):

- Option C (Quality – Definition of crimp, the handle etc) was chosen as the most important wool characteristic for the selection of rams.
- Option B (Length) was the second most important wool characteristic for the selection of rams.
- Option D (Staple formation) was the third most important wool characteristic for the selection of rams.

5.4.2.2 Ewes.

The following wool characteristics were regarded as important for the selection of ewes (Table 4.6):

- Option A (Fineness) was chosen as the most important characteristic for the selection of ewes.
- Option B (Length) was the second most important characteristic for the selection of ewes.
- Option D (Staple formation) was the third most important characteristic for the selection of ewes.

5.4.3 How the ewes that did not take were effectively culled.

All farmers chose Option D (Do not cull ewes that did not take because ewes were not identified) because the farmers did not identify the ewes that did not lamb. The other reason mentioned was that, because of the small numbers of animals, the farmers cannot afford to cull the ewes. There are almost no surplus animals to sell. The reasons relates back to the problems with the very low weaning percentage.

5.4.4 Methods applied to select against weak mothering characteristics.

Option E (Do not cull for weak mothering characteristics) was the choice of all the farmers. They did not cull for weak mothering characteristics. The reason for this is the fact that the numbers of the ewes are too small and the effected ewes were also not marked.

5.4.5 The single method applied in the past lambing season to identify multiple ewes as well as the relevant lambs.

Option D (Do not mark multiple ewes and their lambs for identification) was the preferred choice by all the farmers. No ewes or lambs were marked by the farmers. Some of the farmers own sheep, but are not involved with the management of the sheep. It is clear that there is an urgent need for training farmers how to manage their sheep.

5.4.6 The selection of young ewes to be taken up in the flock as replacement ewes.

The selection of young ewes is done by farmers themselves (Option A: Farmer himself). Selection of younger ewes is not very important for communal farmers because of the small size of the flock. All the young ewes are usually taken up in the flock.

5.4.7 Methods used to determine the fertility of rams.

The farmers did not do anything to determine the fertility of the rams (Option D: Did not do anything). No rams are tested for fertility. The reasons are that they believe the rams are naturally fertile and never had infertility problems with rams.

5.5 MATING AND REPRODUCTION

5.5.1 Number of rams used per 100 sheep.

All the farmers farm with small numbers of sheep. Each farmer keeps only 2 rams per 100 ewes. The reason is that the grazing is common for all the farmers and that all the rams will serve all available ewes. Ownership of rams does not really matter when it comes to mating. There is no mating season as such, the rams mate the ewes whenever nature calls. The informal nature of farming results in a slower progress of development. This compares very well with the comment from Dillon (2002) that a lack of infrastructure and subsequent conflict over the use of existing resources has greatly hampered agricultural development.

5.5.2 Duration of mating period and type of mating practices used.

The rams are always with the ewes for the full 12 months (52 weeks) of the year. The reason is that it is difficult to separate rams from ewes due to no proper camping systems. The lack of infrastructure results in no fences, no grazing systems and poor veldt management.

5.5.3 Two months of the year best for mating.

December and January is the two best months for mating. The reasons are that during these two months enough grazing is available and the ewes and rams tend to be in a good condition. The Hewu area is a summer rainfall area. That is why there is sufficient grazing available resulting into the ewes and rams in a phase of gaining weight.

Young ewes are not separated from the old ewes during the mating season because of a lack of camp systems. According to Schutte *et. al.* (1986:77) and Van Tonder (1985:19) it has been proven that conception is higher during periods of maximum mating activities, shortly before the highlight of the natural mating season. Closer to the peak of the mating season, the heat period tends to be longer and the total ovulation also increases. The outcome is that the chances are higher that the ewes are impregnated during autumn (natural mating season) than in the spring mating season.

5.5.4 Reproduction management of ewes and rams.

No farmers are using teaser rams before mating. According to Boshoff and Coetzee (1999:18) 3% of all active teaser rams must be place with the ewes, 14 days prior to mating time. They must be replaced on the evening of day 14 by 3% - 4% rams.

In the Hewu area the total number of ewes is 4 622 and all of them are mated. Only 227 ewes did not take the ram in the past season. The reason is that some of the ewes were too old and some were not in a good condition. About 50 ewes aborted. The communal system with a lack of infrastructure and knowledge make it very difficult to manage the sheep in a scientific way.

A total of 4384 lambs were born alive. That is a lambing percentage of 94.85% (paragraph 4.5.11). This result is very high because the animals mate when nature calls which is different from a more controlled and artificial mating period. This lambing percentage is higher than that of De Klerk *at. al.* (1983:106) who states that the average lambing percentage of Merino sheep is 71%, the average lambing percentage of wool farmers with other wool sheep breeds is 74.3%. According to McMaster (1999:7) the average lambing percentage of the Döhne Merino of Katkop in the Karoo is 98% for mature ewes and 92% for young ewes. According to Geyer (2007a:54) the average lambing percentage for Merino sheep in the 2006 study groups were 89.44%. He stressed the importance of lambing percentage as a reproduction norm.

There were only 797 lambs weaned (18.18% survival rate and 17.24% ewe productivity rate). Excessive losses took place. A total number of 3587 lambs were lost or died (81.82%). These huge losses occur because the ewes were mated at the wrong time. Mating in the summer means that lambing is in the winter. During the winter months in Hewu it is very cold and very dry as it is a summer rainfall area. The ewes lamb during the coldest time of the year with no good food. Because of the frost and snow the grass available only acts as a dry matter with almost no protein. That is why supplementary feeding during the winter months is essential.

The only way to solve the problem of mating at the wrong time is to put up some fences. Fencing will help to keep all the rams separate from the ewes. That will mean that the rams and ewes can be well prepared for the mating season. The mating season for that area is suppose to be during autumn resulting in a spring lambing season. The ewes will then lamb during the warmer part of the year with better veldt than during the winter. If such a system can be introduced, the lambing and weaning percentage can be increased. With an increase in the weaning percentage, more

surplus lambs will be available to replace old ewes and to be sold. Old ewes and the surplus weaned lambs can then be sold to improve the financial position of the farmers. According to Geyer (2007a:54) the average wool income for Merino sheep in the 2006 Merino study groups was 38% leaving the mutton income at 62%. Wool farmers need to sell meat as well to survive (Geyer, 2008). That will help to alleviate poverty in those areas. With good fences it will be possible to introduce veldt management systems, animal health programs and proper sheep management programs. It is quite clear that the Hewu area is in desperate need for sheep management training and proper fences to develop into a financially sustainable farming community.

5.5.5 Lambing systems.

All the farmers chose Option D (Large flock in large camp). With this lambing system and a lack of proper fencing and management skills, it is understandable why only 18.18% of the lambs born were weaned. Management of new born lambs in a system of large flock in large camps is almost impossible. Very little control can be exercised over a large number of ewes lambing under poor veldt conditions. The current results and lambing system followed emphasizes the urgent need for training and infrastructure.

5.6 RAM PURCHASES

The farmers had never bought rams at auctions. The reason is that the former Ciskei Government used to supply farmers with rams. Some rams were bought from fellow farmers or direct from ram breeders out of hand. Formal ram auctions do not exist in the area of investigation.

5.7 ANIMAL HEALTH

5.7.1 Vaccination.

All the farmers inoculated the sheep against pulpy kidney, blue tongue and enzootic abortion. Pulpy kidney is seen as one of the most important diseases. It is a great concern that blue udder is causing problems for 70% of the respondents but they do not treat the sheep in advance to limit the disease (Table 4.8, 4.9 and 4.10).

5.7.2 Dipping.

The farmers dip their sheep four times a year. The most important problem for the area is sheep scab and Karoo paralysis tick (Table 4.11).

5.7.3 Dosage.

The farmers dose their sheep against Roundworm, Tapeworm and Liver fluke during a normal season. Worms caused the most problems as internal parasites in the research area (Table 4.12). The farmers dosed their sheep twice a year during a normal season, once during the summer and once during the early winter.

According to Herselman (1999:24), the high cost of dose remedies together with the increase in the resistance of parasites against the most dose remedies necessitate the farmers to use alternative parasite controls. To save and prevent unnecessary exposure of low parasite infection (or contamination) from dose remedies, it is important to dose only when it is really necessary.

5.8 FEEDING

The results in paragraph 4.8.1 state that no farmers flush their ewes. They do not understand the reason for the flushing of ewes. The farmers need to be trained on sheep management. They also do not use supplementary feeding during the late stages of pregnancy.

5.8.1 Supplementary feeding for lactating ewes.

Most of the farmers use supplementary feeding for the lactating ewes. Table 4.13 shows that 73% of the farmers use pasture and 19.27% use rested vested veldt as supplementary feed to the lactating ewes. It is a very good practice to provide supplementary feed to the lactating ewes. The supplementary feeding will help the ewes to increase their milk production.

5.8.2 The aspect of creep feeding to ewes.

No farmers make use of creep feed for their ewes during a normal season. Haresign (181:197) and Meaker and Van Niekerk (1971:107) clearly states that meaningful increases in the ovulating rate will only be achieved should ewes be creep fed for at least one estrus cycle (17 days) before mating time and also on condition that the ewes condition is normal and not overweight.

5.9 LAMB MORTALITIES

5.9.1 The most important causes of lamb losses.

The farmers indicated that the most important reasons for the high lamb mortality rates are due to poor veldt conditions (33.33%), followed by poor mothering characteristics (23.81%) and predators/vermin with 21.43%. That corresponds with the study group results that predators, poor veldt conditions, management and cold spells are the most important causes for lamb losses (Geyer, 2007). Most of the lamb losses occur between birth and weaning. A total of 9 farmers reflected a loss of 13% and 61 farmers had lamb losses of 87% from birth to weaning. This indicates the need of training to the farmers to raise lambs from birth to weaning. It also boils back to the problem of mating during the wrong time (spring, summer) and lambing in the winter months with poor veldt conditions and cold spells. The mating period need to be changed.

All the farmers had no losses between weaning up to 12 months of age. It is because of the very few lambs that were weaned and therefore the management was easy.

5.10 FECUNDITY (Fertility)

The problems regarding the low weaning percentage of only 18.18% was discussed in paragraph 5.5.4 (Management of ewes and rams). Another interesting result is that none of the farmers welcome twins. They do not want twins because twins require more attention. It is therefore clear that these farmers need to be trained how to raise twins. It is important that they understand the benefits of twins. There must be a much more optimistic thought about twins.

5.11 MARKETING

The marketing of stock seems to be a major problem. No lambs are sold because of the very low numbers that survive. All the wethers, culled sheep and old animals are sold amongst the other farmers or to the local market. The farmers also mentioned the fact that it is very difficult to get the sheep in a good condition to be marketed because of the poor veldt conditions and a lack of knowledge of how to prepare sheep to be sold for slaughtering purposes.

The farmers have very limited knowledge about marketing. Price determination is also a serious problem. The farmers have to rely on the prices paid by the speculators. Formal markets and auctions are almost non existent. The marketing of sheep needs to be a very important program when training farmers. It is important for the farmers to realize that they need to sell sheep to make a living.

5.12 CONCLUSION

The results presented in Chapter 4 were discussed in Chapter 5. There is a major concern about a large number of outcomes. It was continuously discussed raising questions about certain practices like record keeping, problems affecting sheep farming, wool production, selection criteria for ewes, rams and wool separately, mating and reproduction, lambing systems, ram purchases, animal health, feeding, lamb mortalities and the issue of marketing.

The discussion of the results paved the way for improvement from the current situation. Communal farming is a very sensitive matter. All the people need to farm together as a unit, with no one owning any land. The results illustrated that there is a desperate need for training, extension and development.

CHAPTER 6

INTERPRETATION, RECOMMENDATIONS AND CONCLUSION.

6.1 INTRODUCTION

Chapter 6 consists of the general interpretation, conclusion and recommendations of the research being done. This chapter will bring all the information together resulting in an important tool for decision making, training and skills development.

6.2 GENERAL

The Hewu district is formed by 22 small villages. It is situated near Queenstown in the Eastern Cape Province of South Africa. In these areas communal farming is practiced and livestock is the major source of income. The size of the grazing land ranges from 2000 hectares to 5000 hectares. Wool production is one of the major products produced.

The farmers are not crossing their cull ewes. Detail record keeping for economic purposes is extremely difficult in a communal area. It is usually just the number of animals that are regarded as important. The farmers use the Department of agriculture as the most important source of information. The most important problems affecting the efficiency of sheep farming are poor veldt conditions, management problems in the lambing season and stock theft.

Veldt management is the most important tool for profitable farming. Poor veldt will directly lead to poor livestock production which will influence the quality of the product produced and the income part of the farm. If a high number of lambs can be born and weaned, it will result into better income as well as sufficient numbers of young livestock for the selection of replacement ewes.

6.2.1. Recommendations

- The Department of Agriculture must support the small farmers with extension services.
- Determine the training and skills development needs required.
- Assist the farmers to improve the quality of the product produced.
- Organize information days for demonstration purposes and hands on training.

6.3 PRODUCTION

The farmers shear their sheep every 12 months usually in October of every year. It is preferred to shear their sheep in late spring when the weather is warm and sufficient grazing is available. The average wool production per sheep is 2.17kg. The clip averages a fineness of 19.1-20 micron.

6.3.1. Recommendation

- The very low wool production per sheep (2.17kg) can be increased by good quality breeding stock. Good quality rams and ewes need to be introduced in the area.
- Farmers need to be trained in wool classing.

6.4 SELECTION PRACTISES

When selecting for wool sheep, the farmers select for body weight, conformation and fertility. When the selection for rams is done, wool quality is the most important characteristic, followed by length of the wool and the staple formation. When selecting for ewes, fineness of the wool is the most important characteristic followed by length and staple formation.

No ewes are culled that did not take the ram because the farmers did not identify the ewes that did not lamb. The other reason mentioned was that because of the small numbers of animals, the farmers cannot afford to cull

the ewes. No culling takes place of ewes with weak mothering characteristics either, reasoning the small numbers of ewes and the fact that they are not marked properly.

The selection of young ewes is done by farmers themselves. The selection of young ewes is not very important for communal farmers. The reason this is lack of proper information and the size of the flock.

The farmers also do not test their rams for fertility because they believe the rams are naturally fertile.

The selection of sheep is very important in order for the farmer to keep the best ewes or rams to improve the genetics of the breeding stock. With no selection at all, it is impossible to get rid of unwanted traits.

6.4.1. Recommendation

- Intensive training on the genetics of breeding and selection.
- Farmers need to be trained on the important characteristics for the selection of rams, ewes and wool separately.

6.5 MATING AND REPRODUCTION

The farmers use two percent rams for mating purposes (Two rams per 100 ewes). The reason was that grazing is common for all the farmers and that all the rams will serve all the available ewes. Rams stay with the ewes during the year (12 months - 52 weeks) resulting in a continuous mating practice.

The grazing is not fenced off into camps causing major problems for sheep management. Farmers indicated that the best months for mating are during December and January. During those two months enough grazing is available and the ewes and rams tend to be in good condition.

The lack of proper fencing and camps causes young ewes not to be separated from old ewes during mating. The farmers also do not understand why young ewes need to be mated separately from old ewes. No teaser rams are used.

The lambing percentage is 94.85% (Lambs were born alive as a percentage of the number of ewes mated). The weaning percentage was only 18.18% (Lambs weaned as a percentage of the number of lambs born) and 17.24% (Lambs weaned as a percentage of the number of ewes mated). Mating and reproduction are some of the most important factors for sheep management. It is clear that the farmers have many problems which effect their production poorly.

A key requirement for sustainable communal development is the integration of communal planning with the Department of Agriculture planning process. In order to achieve sustainable agriculture in the communal areas, land use must be ecologically sound, economically viable and socially acceptable.

6.5.1. Recommendation

- Intensive involvement from the Department of Agriculture for extension services and support
- The involvement of the National Wool Grower's Association from South Africa (NWGA of SA).
- The urgent need for fencing and camps.
- The major need for training and skills development.

6.6 RAM PURCHASES

No rams are bought at auctions because the former Ciskei government used to supply farmers with rams. Some rams were bought from fellow farmers or direct from ram breeders out of hand. Formal ram auction do not exist in the area of investigation.

6.6.1. Recommendation

- Farmers need to be trained and assisted when buying rams.
- Farmers need to have access to formal ram sales in their area.

6.7 ANIMAL HEALTH

Farmers inoculate sheep against pulpy kidney, blue tongue and enzootic abortion during dry and normal seasons. Pulpy kidney is regarded as the most important disease. The sheep are dipped four times a year. Most farmers are dipping their sheep against sheep scab and Karoo paralysis tick. The sheep are dosed against roundworm, tapeworm and liver fluke.

6.7.1. Recommendation

- Farmers need to be supported continuously with new animal health information.

6.8 FEEDING

The farmers do not make use of creep feed for ewes during a normal season or a dry season. They also do not supplementary feed ewes during the late pregnancy stage. During the lactating phase, 73% of farmers do supplement the lactating ewes using planted pastures. Other farmers (19.27%) use rested veldt as a form of supplementary feeding for the lactating ewes. The most important reasons for the high lamb mortality rate is due to poor veldt conditions, poor mothering characteristics and predators/vermin. Stillborn lambs do not occur in the area.

6.8.1. Recommendation

- The Department of Agriculture urgently needs to develop a detail veldt management system.
- Farm planning and fences is an absolute necessity.
- The farmers need to be trained in feeding and supplementary feeding.

6.9 FECUNDITY (fertility)

The lambing percentage of the ewes is 94.85% (Number of lambs born alive (4384) divided by the number of ewes mated (4622)). The weaning percentage referring to the reproductive efficiency of the mated ewes is only 17.24% (Number of lambs weaned (797) divided by the number of ewes mated (4622)). The survival rate of the lambs born alive is only 18.18% (Number of lambs weaned (797) divided by the number of lambs born alive (4384)). The farmers do not welcome twins. They do not want twins because twins are requiring more attention.

6.9.1. Recommendation

- Training in sheep management practices is urgently important (During which months the rams need to mate the ewes, how to ensure sufficient feed during the lambing and weaning seasons, how to raise a lamb, etc).
- The abovementioned results urge the absolute need for fences and camps.

6.10 MARKETING

No slaughter-lambs are sold. There is just not enough numbers to sell any surplus stock. In some cases farmers are selling adult wethers and old ewes to the local markets.

6.10.1. Recommendation

- The farmers need some training on how to determine the value of an animal.
- The farmers need some training on the marketing of their livestock as well as the wool produced.

6.11 CONCLUSION

6.11.1 Hypothesis

The research project succeeded in proofing the hypothesis correct:

- **Skills and infrastructure constrains hamper proper management systems resulting into low production and reproduction percentages causing poverty.**

The outcome of this research project showed quite clearly that poor management systems exist. The lack of certain skills and poor infrastructure resulted into poor production and reproduction actions. These poor performances are directly responsible for the poverty that exists.

6.11.2 Objectives

The research project managed to meet the objectives:

- **Establishment of production norms (PRODUCTION : Paragraph 4.5)**

It was established that the farmers are shearing every 12 months during October. The clip averaged a fineness of 19.1 – 20 micron. A total number of 7931 sheep was shorn with the adult animals (5860) representing 73.98% of the total flock. The ram ewe ratio is 3.56%. The total amount of wool shorn is 17 217kg as discussed in paragraph 4.5.3 that results in 2.17kg of wool per animal per year.

- **Establishment of reproduction norms (MATING AND REPRODUCTION : Paragraph 4.7)**

As all farmers in the Hewu area farm with small flocks of sheep, each farmer keeps 2 rams per 100 ewes. The rams are always with the ewes for the total year (52 weeks). It is difficult to separate rams from ewes due to no proper camping systems. The grazing is common for all the farmers and the rams will serve all available ewes.

The lambing percentage is 94.85% (Lambs were born alive as a percentage of the number of ewes mated). The weaning percentage was only 18.18% (Lambs weaned as a percentage of the number of ewes mated). Mating and reproduction are some of the most important factors for sheep management. It is clear that the farmers have many problems which effect their reproduction poorly.

- **Establishment of effective management practices for wool sheep farmers (SELECTION PRACTICES : Paragraph 4.6; PURCHASE OF RAMS : Paragraph 4.8; ANIMAL HEALTH : Paragraph 4.9; FEEDING : Paragraph 4.10; LAMB MORTALITIES : Paragraph 4.11; FECUNDITY : Paragraph 4.12; MARKETING : Paragraph 4.13 & 5.11)**
  - **Selection practises and purchasing of rams:** When selecting a ram, the quality of the wool is the most important wool characteristic of all the farmers (100.00%). It is followed by length (80.00%) and staple formation (68.57%). For the selection of ewes, fineness is the most important wool characteristic when the farmers are selecting ewes (100.00%), followed by length (90.00%) and staple formation (60.00%). The farmers did not cull for weak mothering characteristic because the remaining number of ewes is too small. The fertility of the rams is not examined in advance. The farmers have never bought rams at auctions. The availability of good breeding material is a problem.
  - **Animal health:** The three most important diseases affecting efficiency of sheep farming in the research area seems to be pulpy kidney, blue tongue and enzootic abortion. The most important external parasites are sheep scab, Karoo paralysis tick and normal ticks. The most important internal parasites are tapeworm, roundworm and nasal worms. All the farmers in the communal farm are not flushing the ewes before mating.

- **Feeding, lamb mortalities, fecundity and marketing:** Poor veldt condition is the most important cause of lamb losses (100.00%), followed by poor mothering characteristics with 71.43% and predators/vermin with 64.29%. The lambing percentage is 94.85% (Lambs were born alive as a percentage of the number of ewes mated) while the weaning percentage was only 18.18% (Lambs weaned as a percentage of the number of ewes mated). No lambs are sold because of the very low numbers that survive. All the wethers, culled sheep and old animals are sold amongst the other farmers or to the local market. The farmers have very limited knowledge about marketing.

6.11.3 A 10-point plan for the improvement of communal farming

1) The establishment of selection objectives for animal production and wool production.
2) Special preparation (feeding and animal health) of rams and ewes before the mating period.
3) Increasing of lambing percentage (lambs born alive).
4) Care for ewe and lamb during the lactation period.
5) Increased weaning percentage (survival of the lambs).
6) Value adding of the product (wool classing).
7) Investigate alternative marketing options.
8) Adapt to a continuously changing environment (technology).
9) Maintain and extend infrastructure.
10) Continuous improvement of management skills.

6.11.4 General

- The long term sustainability of wool production in the Hewu area is closely linked to the availability of suitable or appropriate natural resources and infrastructure. Currently the resources available, the internal and external infrastructure in the Hewu area, are not

maintained well enough to support the effective utilization of the resources for successful wool production. The influence of the rapidly increasing population growth results into a greater demand for natural resources. Effective livestock- and grazing management systems for a communal area is essential for the successful development of farmers on communal grazing areas.

- Guidance in farming matters should not only be given to household heads, but also to spouses and children. The involvement of wives and successors in the decision-making process will ensure the success of sheep farming and the implementation of long-term plans and programmes. A low level of formal educational and training and a lack of independent experience impact negatively on the managerial skills and farming know-how of farmers. To overcome this obstacle, it is recommended that farmers undergo managerial training and receive technical assistance.
- Commonage development has the potential to make a very significant contribution towards the development of the rural areas, in particular with regard to the following: the creation of household food security, wealth creation by means of market gardens, the creation of opportunities for micro-entrepreneurs, securing land for stockowners and job creation. Farmers and community members, who have access to grazing and cultivated land in communal areas, must be part of grazing committees at local level.
- To be successful and to make a profit, farmers should make the right financial decisions with regard to the cost of the following: production, reproduction, culling rate, young ewe management, flock distribution, housing and environment, animal feed and feeding. Farmers must be able to formulate objectives, formulate well-considered plans and implement them. The implementation strategy must include a timetable of events to identify priorities, and enable the farmer to set goals and target dates for development needs. The following must be

borne in mind: finances, overhead costs, capital development expenses, labour and machinery, cash-flow budget, livestock flow and other factors such as the availability of markets and transport facilities, as well as restrictions such as quotas.

- The service delivery system should become more responsive to the needs and aspiration of sheep farmers. Development activities directed towards sheep farming operation should therefore be based upon sound technical, financial and administrative procedures. Training directed at sheep farmers should basically focus on helping them to achieve self-reliance and economically and environmentally sound practices. The success of sheep farming may be enhanced by emphasizing training and ensuring the availability of funds.
- A detailed survey and evaluation of the extension services available to farmers grazing on communal land need to be done. Extension can play a supportive role in informing farmers of the availability and accessibility of such services. It must be the responsibility of the extension services to render a service for training, skills development, management information and economic analyses to help farmers in decision making.

6.12 FUTURE RESEARCH

- Research need to be done on the livestock carrying capacity of communal land to develop proper veldt management systems.
- Determine the training needs of the people.
- Determine the level on which training should be conducted.
- Determine the life skill abilities of the households.
- Develop a system to gather reliable information for economic analyses.

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END

ANNEXURE A

A. GENERAL

In which **MAGISTERIAL DISTRICT** do you farm?

……..

……..

With what sheep breed do you farm?
(Mark **only ONE** with a X)

Wool breed	**Dual purpose breed**	**Cross breed**	**Other (Name)**
Merino	Döhne-Merino		

Question 1:

Do you apply cross-breeding on your **cull-ewes**?

(a) Yes ……
(b) No ……
(c) Not applicable ……

If **Yes:-** With what other breed do you do cross-breeding on your herd? ……

Question 2:

Mark applicable option with X (Mark only ONE)

Which of the following options apply to the **recordkeeping** of your sheep farming?

(a) Keep complete records of the reproduction and performance of all the sheep in the flock ……

(b) Keep records of number of ewes mated as well as lambing and weaning percentages ……

(c) Keep figures and know how many lambs have been weaned ……

(d) Keep figures, but no records ……

Question 3:

Who or what are the **TWO** most important **sources of information** of which you make use in your sheep farming?

Mark the most important source with 2 and the less important source with a 1

(Mark only TWO!)

(a) Department of Agriculture ……

(b) BKB and/or CMW agents ……

(c) Fellow farmers ……

(d) Wool Farmer News ……

(e) Grootfontein Agricultural College ……

(f) Other (Name) ……

Question 4:

What do you see as the **THREE** most important **problems** which effect your effort to enhance the efficiency of your sheep farming?

Mark the most important problem with a 3, the second most important with a 2 and the less important with a 1

(Mark only THREE!)

(a) Predators/vermin ……

(b) Poor veld conditions ……

(c) Theft ……

(d) Labour ……

(e) Straying problems (do not stay in camps) ……

(f) Management problems in the lambing season ……

(g) Diseases and disease control ……

(h) Other (Name) ……

B. PRODUCTION

Question 5:

Do you usually shear your sheep every 8, 10, or 12 months?

Indicate the option mostly applicable to you, with a X

(a) 8 months ……

(b) 10 months ……

(c) 12 months ……

(d) Other (Name) ……

Question 6:

During which month(s) of the year do you shear?

Indicate only the specific month(s) that are applicable to you, with a X

YEAR 1

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

YEAR 2

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

YEAR 3

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Question 7:

What is the total amount of wool (net mass), being shorn during the previous clip?

Write in: ……kg (net mass)

Question 8:

Indicate the option mostly applicable to you, with a X

What is the average micron of your last clip?

(a) 19 micron and finer ……

(b) 19,1 – 20 micron ……

(c) 20,1 – 22 micron ……

(d) 22,1 – 24 micron ……

(e) 24,1 – 27 micron ……

Question 9:

How many sheep were shorn, during the last clip?

LIVESTOCK	**AMOUNT**
Lambs	
Weaned lambs	
Young ewes	
Young hamels	
Ewes	
Hamels	
Rams	
TOTAL	

C. SELECTION PRACTICES

Question 10:

What in your opinion are the **THREE** most **important characteristics** which a sheep farmer should bear in mind when selecting his **animals**?

Mark the most important characteristic with a 3, the second most important with a 2 and the less important with a 1

(Mark only THREE with Ewes and THREE with Rams!)

		Ewes	**Rams**
(a)	Conformation	…….	…….
(b)	Size (body-weight)	…….	…….
(c)	Fertility	…….	…….
(d)	Mothering characteristics	…….	…….
(e)	Good developed sexual organs	…….	…….
(f)	Healthy udder	…….	…….
(g)	Other (Name)	…….	…….

Question 11:

What in your opinion are the **THREE** most **important wool characteristics** which a wool sheep farmer should bear in mind when selecting his **animals**?

		Ewes	**Rams**
(a)	Fineness	…….	…….
(b)	Length	…….	…….
(c)	Quality (definition of crimp, the handle etc.)	…….	…….
(d)	Staple formation	…….	…….
(e)	Colour	…….	…….
(f)	Other (Name)	…….	…….

Question 12:

What have you done in the past year to ensure that **ewes which did not take** (did not lamb) were effectively **culled** from the flock?

Mark the applicable item with a X

(a)	Keep full production records and cull ewes accordingly	…….
(b)	Mark all ewes that did not take and cull ewes accordingly	…….
(c)	Mark only some of the ewes that did not take for slaughtering	…….
(d)	Do not cull ewes that did not take because ewes were not identified	…….

Question 13:

What **method** do you apply to select against weak mothering characteristics?

Mark the applicable item with a X

(a) Use strict supervision during the lambing season and mark all ewes with udder defects and those which reject lambs and then cull the **lambs** and the **ewes** ……

(b) Use strict supervision during the lambing season and mark all ewes with udder defects and those which reject lambs and then cull **only the ewe** ……

(c) Mark only ewes with obvious udder defects and ewes which reject lambs and then cull the **ewe** ……

(d) Mark only some of the ewes whose lambs do not Flourish or which die and cull the **ewe** ……

(e) Do not cull for weak mothering characteristics ……

Question 14:

Which **single method** did you apply in the past lambing season to identify **multiple ewes** as well as the relevant **lambs**?

(a) Identify and mark all multiple **ewes** as well as their **lambs** under strict supervision for future identification ……

(b) Keep ewes with multiple lambs separate without Marking them for future identification ……

(c) Take note of the multiple births and keep some Of the multiple ewes (triplets) and her lambs separate ……

(d) Do not mark multiple ewes and their lambs for identification ……

Question 15:

Who does the **selection of young ewes** which will be taken up in your flock as replacement ewes?

Mark only the most important person with a X

(a)	Farmer himself	…….
(b)	BKB or CMW agent (alone)	…….
(c)	Fellow farmer	…….
(d)	Farmer, and BKB/CMW agent	…….
(e)	Other (Name)	…….

Question 16:

What have you done in the past year to determine whether the **rams** you used were **fertile**?

S	**Mark the item which is applicable to you with a X**	
(a)	Had clinical fertility tests done on all rams just before mating season and had their reproductive organs examined by a vet	…….
(b)	Had reproductive organs examined by a vet just before mating season	…….
(c)	Examined reproductive organs yourself just before mating season	…….
(d)	Did not do anything	…….

D. MATING AND REPRODUCTION

Question 17:

How many rams do you use per 100 ewes?

Write in the number …….

Question 18:

For **how long** (in weeks) do you put the rams with the ewes?

……. weeks

Question 19:

What type of **mating practice(s)** do you mostly use in your sheep farming?

Indicate the option which is applicable to you with a X		
(a)	Rams are continuously with the ewes	…….
(b)	Mate once a year	…….
(c)	Mate three times in two years	…….
(d)	AI	…….
(e)	Other (Name)	…….

Question 20:

Which **two months** of the year are the best mating season in your area?

Write the two months in: …… and ……

Question 21:

Do you mate the **young ewes** separately?

Mark the option which applies to you with a X

Yes ……. No …….

Question 22:

Do you use **teaser rams** before the mating season?

Mark the option which applies to you with a X

Yes …… No ……

If **YES:-** Indicate period (in weeks) of teasing?

Write in: ……. weeks

Question 23:

How many **ewes** (ewe lambs excluded) are in your breeding flock?

Write down the number ……..

Question 24:

How many **ewes** have you **mated** in the past season?

Write down the number ……..

Question 25:

How many of these **ewes did not take**?

Write down the number ……..

Question 26:

How many of these **ewes aborted**?

Write down the number …….

Question 27:

How many **lambs** were born **alive**?

Write down the number ……..

Question 28:

How many **lambs** did you **wean/**

Write down the number ……..

Question 29:

Which **LAMBING SYSTEM(S)** do you make use of?

Indicate the option most applicable to you with a X

(a) Kraal method with small pens for multiples …….

(b) Pastures …….

(c) Small flock in small camp …….

(d) Large flock in large camp …….

(e) Drifting System …….

(f) Other (Name) …….

E. PURCHASING OF RAMS

Question 30:

Have you ever bought **rams** at **auctions** (not veld ram auctions)?

Mark the option which applies to you with a X

Yes ……. No …….

Question 31:

Have you had **problems** with purchased rams?

Mark the option which applies to you with a X

Yes ……. No …….

Question 32:

Can you **identify** the **problems** according to the items below?

Mark the TWO most important problems according to your view. Mark the most important problem with a 2 and the less important with a 1

(Mark only TWO!)

(a) Rams have problems adapting to veld conditions ……

(b) Some rams die shortly after they were bought ……

(c) Some rams do not have servicing capabilities ……

(d) Some rams do not service the ewes in the first mating season after purchased ……

(e) Some rams are sterile ……

(f) Other (Name) ……

……

Question 33:

Would you prefer to buy **flock rams at veld ram auctions**?

Mark the option which applies to you with a X

Yes …… No ……

F. ANIMAL HEALTH

Question 34:

Against which of the following diseases do you **inoculate** your sheep?

Indicate the options most applicable to you with a X			
		Normal Season	**Dry Season**
(a)	Pulpy kidney	…….	…….
(b)	Blue tongue	…….	…….
(c)	Enzootic abortion	…….	…….
(d)	Blue udder	…….	…….
(e)	Gas gangrene (C. Septicum)	…….	…….
(f)	Orf (Scabby mouth)	…….	…….
(g)	Dysentery	…….	…….
(h)	Other (Name)	…….	…….
(i)	Do not inoculate at all	…….	…….

Question 35:

Which **three** of the following **diseases NORMALLY** give you the **most problems**?

Mark the most important problem with a 3, the second most important with a 2 and the less important with a 1		
(Mark only THREE!)		
(a)	Pulpy kidney	…….
(b)	Blue tongue	…….
(c)	Enzootic abortion	…….
(d)	Blue udder	…….
(e)	Gas gangrene (C. Septicum)	…….
(f)	Orf (Scabby mouth)	…….
(g)	Dysentery	…….
(h)	Other (Name)	…….

Question 36:

Which external parasites do you **NORMALLY dip (as well as pour on remedies)** your sheep for?

Indicate the options which apply to you with a X		
(a)	Australian itch mites	…….
(b)	Ticks (“normal ticks”)	…….
(c)	“Bont” leg tick	…….
(d)	Sheep blowfly	…….
(e)	Karoo paralysis tick	…….
(f)	Other (Name)	…….
(g)	Do not dip at all	…….

Question 37:

How **regularly** do you **dip (as well as pour on remedies)** your sheep per year?

Write down the number of times (number) …….

Question 38:

Which **internal parasites** do you **dose** for?

Indicate the options which apply to you with a X			
		Normal Season	**Dry Season**
(a)	Roundworm	…….	…….
(b)	Tapeworm	…….	…….
(c)	Liver fluke	…….	…….
(d)	Conical fluke	…….	…….
(e)	Nasalworm	…….	…….
(f)	Other (Name)	…….	…….
(i)	Do not dose at all	…….	…….

Question 39:

How **often do you dose your sheep** per year?

	Normal Season	**Dry Season**
Write down the number of times (number)…….	…….	…….

G. FEEDING

Question 40:

Do you **flush** your **ewes**?

Mark the option which applies to you with a X

Normal season	**Dry season**
Yes ……. No …….	Yes ……. No …….

If **YES:-** Indicate period (in weeks) of flushing

Write in: ……. weeks

Question 41:

What kind of **feed** do you use when **flushing** the **ewes**?

Mark the options which apply to you with a X

(a)	Chocolate maize	…….
(b)	Maize	…….
(c)	Lucerne	…….
(d)	Feed pellets	…….
(e)	Rested veld	…….
(f)	Pastures	…….
(g)	Licks	…….
(h)	Other (Name)	…….

Question 42:

Do you give **supplementary feeding** to ewes in the **late stages of pregnancy**?

Mark the option which applies to you with a X

Normal season	**Dry season**
Yes ……. No …….	Yes ……. No …….

If **YES:-** Indicate period (in weeks) of supplementary feeding for ewes in late pregnancy

Write in: ……. weeks

Question 43:

What is used as **supplementary feeding** for **ewes in late stages of pregnancy**?

Mark the options which apply to you with a X		
(a)	Chocolate maize	…….
(b)	Maize	…….
(c)	Lucerne	…….
(d)	Feed pellets	…….
(e)	Rested veld	…….
(f)	Pastures	…….
(g)	Licks	…….
(h)	Other (Name)	…….

Question 44:

Do you give **supplementary feeding** to **lactating ewes**?

Mark the option which applies to you with a X

Normal season	**Dry season**
Yes ……. No …….	Yes ……. No …….

If **YES:-** Indicate period (in weeks) of supplementary feeding for lactating ewes

Write in: ……. weeks

Question 45:

What is used as **supplementary feeding** for **lactating ewes**?

Mark the options which apply to you with a X		
(a)	Chocolate maize	…….
(b)	Maize	…….
(c)	Lucerne	…….
(d)	Feed pellets	…….
(e)	Rested veld	…….
(f)	Pastures	…….
(g)	Licks	…….
(h)	Other (Name)	…….

If feed pellets and/or licks are used, please indicate with an X which is applicable in your situation

Feed Pellets

Drought pellets	…….
Finishing pellets	…….
Ewe and lamb pellets	…….

Licks

Energy licks	…….
Urea lick	…….
Natural protein (ex. Fish meal)	…….
Salt-phosphate lick	…….

H. LAMB MORTALITIES

Question 46:

In your case what were the **THREE** most important causes of lamb losses last year?

Mark the most important cause with a 3, the second most important with a 2 and the less important with a 1

(Mark only THREE!)

(a) Predators/vermin ……

(b) Poor veld conditions ……

(c) Poor mothering characteristics ……

(d) Multiples of which some lambs are too weak and, Too difficult to cope with, for the ewe and the Supervisor ……

(e) Ewes strays and becomes separated from lambs ……

(f) Coccidiosis ……

(g) Other (Name) ……

Question 47:

Which percentages **STILLBORN** lambs have your ewes had in the past lambing season?

Write in the percentage ……%

Question 48:

Which percentage losses have occurred from **BIRTH TO WEANING** in the past lambing season?

Write in the percentage ……%

Question 49:

Which percentage losses have occurred from **WEANING TO 12 MONTHS** in the past lambing season?

Write in the percentage ……%

Question 50:

Which percentage losses have occurred from **12 MONTHS TO 18 MONTHS** in the past lambing season?

Write in the percentage ……%

I. FECUNDITY (FERTILITY)

(Ability to produce MULTIPLES)

Question 51:

What was the **WEANING PERCENTAGE** in the past lambing season?

Write in the percentage ……%

Question 52:

Which weaning percentage are you **AIMING** for?

Write in the percentage ……%

Question 53:

Which percentage of your ewes have lambed **TWINS** in the past lambing season?

Write in the percentage ……%

Question 54:

Do you welcome it, if your ewes give birth to **TWIN** lambs?

Mark the option which applies to you with a X

Yes …… No ……

Question 55:

If you have answered **NO** to **question 54** – Why did you say **NO**?

Mark the option which applies to you with a X		
(a)	Ewes can only raise one lamb properly	…….
(b)	Ewes usually reject one of the twins	…….
(c)	One of the twins is usually small or weak and die easily	…….
(d)	The extra work and effort to raise the second lamb is not economically justifiable	…….
(e)	If another reason, except the abovementioned Reasons, name it:	

Question 56:

Which percentage of the **SECOND** lambs of the **TWINS** will **SURVIVE** if they are left with the ewe (at lambing place and after that) without in any way interfering?

Write in the percentage ……%

J. MARKETING

Question 57:

At what **age (in months)** do you **market** slaughter-lambs?

Wool breed	**Dual purpose breed**	**Mutton breed**	**Other (Name)**	**Cross-breed**
Merino	Döhne-Merino	Dorper (white/black)		
……kg	……kg	……kg	……kg	……kg

Question 58:

What do these **slaughter-lambs weigh** on average when you market them? (Live weight)

Wool breed	**Dual purpose breed**	**Mutton breed**	**Other (Name)**	**Cross-breed**
Merino	Döhne-Merino	Dorper (white/black)		
……kg	……kg	……kg	……kg	……kg

Question 59:

How or **to whom** do you **sell** the **slaughter-lambs**?

Mark the option which applies to you with a X		
(a)	At auctions	…….
(b)	Controlled market	…….
(c)	Livestock agents (BKB/CMW)	…….
(d)	Private (self)	…….
(e)	Fellow farmers	…….
(f)	Other (Name)	…….

Question 60:

Do you market **hamels** (adult)?

Yes ……. No …….

If **YES:-**

At what **age** do you **market** hamels?

……months/years

Question 61:

How or **to whom** do you **sell** the **hamels**?

Mark the option which applies to you with a X		
(a)	At auctions	…….
(b)	Controlled market	…….
(c)	Livestock agents (BKB/CMW)	…….
(d)	Private (self)	…….
(e)	Fellow farmers	…….
(f)	Other (Name)	…….

Question 62:

How or **to whom** do you **sell** the **culled sheep (old ewes ex.)**?

Mark the option which applies to you with a X		
(a)	At auctions	…….
(b)	Controlled market	…….
(c)	Livestock agents (BKB/CMW)	…….
(d)	Private (self)	…….
(e)	Fellow farmers	…….
(f)	Other (Name)	…….

Question 63:

How many **slaughter-lambs** on average, do you sell per year?

Wool breed	**Dual purpose breed**	**Mutton breed**	**Other (Name)**	**Cross-breed**
Merino	Döhne-Merino	Dorper (white/black)		
……. amount	……. amount	……. amount	……. amount	……. amount

Question 64:

How many **hamels** on average, do you sell per year?

……. amount

Question 65:

How many **culled sheep (old ewes ex.)** on average, do you sell per year?

……. amount

END