

A study of indigenous livestock management in rural KwaZulu –Natal, South Africa



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Abbreviations and Acronyms

BASED	Broadening Agricultural Services and Extension Delivery
CAHWs	Community-based Animal Health Workers
MRDP	Mdukatshani Rural Development Project
CAPE	Community-based Animal Health and Participatory Epidemiology
CPA	Common Property Association KZN Kwazulu- Natal
DFID	Department for International Development (British)
DoA	Department of Agriculture
DoVS	Department of Veterinary Services
IBAR	Inter-African Bureau of Animal Resources
ICRISAT	International Centre for Research in the Semi-arid Tropics
NGO	Non Governmental Organisations
RDP	Rural Development Project, Diocese of Marianhill
Rs	Rands, presently approx 8.8 Rs to 1 €

Executive Summary

1. Between August 13 and September 10 2003 a study was carried out on livestock keeping practices within project farms of the Rural Development Project (RDP) of the Diocese of Marianhill and of MRDP (Mdukatshani Rural Development Project) in KwaZulu-Natal, South Africa. The study was supported by Misereor and carried out in collaboration between an external consultant and the project teams.

2. The TORs for the external consultant indicated that emphasis should be given to
- what people in the project area are presently doing with livestock,
 - the reasons why they keep livestock and which types,
 - what productivity is achieved
 - constraints on livestock production
 - marketing, conflicts etc
 - exploring possible measures of technical and organisational support and investment.

Methods

3. The main methods used during the study were semi-structured interviews, supported by proportional piling. Interviews were either conducted during farm visits or during village(which are these villages Wolfgang and if they are villages they should be named) workshops, where first the species being kept was recorded, and the reason why animals were kept. For the most important species a range of aspects, such as general husbandry, feeding, animal health and breeding were discussed in greater detail. Notes were taken mainly by the project teams.

4. In the RDP three communities/church farms (Maria Trost, St Bernard's and Reichenau) were visited and 2 to 3 day workshops were conducted in each of the locations. Farm visits complemented the workshops. In the MRDP area, one three day workshop was carried out, involving four communities (Ncunjana, Nkasini, Nomoya and Mahlabathini). Other communities (Ngubo, Mathintha, Jeeza and Nqongeni) were visited and interviews with individual farmers were conducted, also covering specific themes, such as involvement of women in animal husbandry or donkey-keeping. A first feed-back to the communities was given at the end of the workshops. In two locations the workshops were affected by the death of a community member.

5. In addition contacts were taken up with the Departments of Agriculture and Veterinary Services in Ladysmith, Estcourt, Pietermaritzburg and at the Cedara Research Station. We also visited the Stockowners Association, a commercial livestock co-operative, which is breeding Nguni Jersey crosses for an NGO in Botha's Hill.

6. A final one day workshop was carried out with the MRDP advisory committee. On this occasion representatives of other organisations working in rural development were also invited. Four members of the RDP team also attended this meeting.

Results

7. As expected livestock has multiple functions. Common species are cattle, goats, chickens and dogs, with sheep, pigs, donkeys, geese and turkeys being minor species which differ according to area.

8. Cattle are regarded by most people as the most important livestock species, although not all people do keep cattle. They are animals of men. Cattle are used for draught, for lobola, for cultural slaughter, for hides, for traditional clothes, for meat and for sales. Their productivity differs greatly between areas. Age of first calves varied from 5 years at St Bernard's to 3 years or less in the Mdukatshani area. Inter-calving intervals varied from 3 years or more at St Bernard's to 1-1.5 years in the Mdukatshani area, with calf mortality generally not being regarded as a major problem. With respect to gender, cattle are clearly animals of men, with women often not even allowed into the kraal (some older men at St Bernard's were even of the opinion that low fertility of cattle may be a consequence of women now entering into the kraal.)

8.1. Ploughing teams include oxen, cows and occasionally even bulls. Ploughing teams can be quite large (up to 4 pairs of animals). The reason, such large teams are used could not be convincingly determined. It may be related the fact that animals being used for draught were introduced by white commercial farmers who used large spans.

8.2 A main reason for keeping cattle is cultural. There seems to be a trend of fewer cattle being paid for lobola than in the past. However cultural slaughter still seem to be quite important, as is customary attire, such as leather skirts for women – a kind of local wedding ring in the MRDP area.

8.3 The main constraints in cattle differ according to area. It can be disease (mainly tick born disease) or feed shortage during the dry season. At St Bernard's the long calving intervals may be caused by mineral deficiency. In the drier Msinga area in particular, frequent droughts can cause widespread cattle mortality.

8.4 Breeding bulls are largely selected on the basis of the performance of their mothers. Contrary to old beliefs, there is no surplus of males, but rather a shortage of breeding bulls.

9. Goats are, like cattle, animals of men. They are used for sales, lobola (goats can be exchanged for cattle), for meat and for cultural slaughter. Although not all households keep goats, their keeping is somewhat more widespread than cattle keeping. Their productivity is high, with age of first lambing at 12-15 months, 3 lambings in 2 years as the norm and frequent twinnings from parity 2 onwards. The main problem with goats seems to be disease. Breeding males are selected largely on the basis of the mother's performance

10. Traditionally chickens are animals managed by the women, although men may own chickens, at least in the Mdukatshani area. They are kept for meat, sales and customary slaughter. Eggs are of lesser importance, and if somebody wants to eat eggs they are often bought from commercial stores. Chicken-keeping is mostly minimal care, although on some farms supported by the Diocese enclosures are provided for hens with small chicks. They are fed once a day and water is also provided. Feeding intensity differs between farms and between areas. Hens are often

selected according to their ability to raise chicks. Cocks are selected according to size and their mothers' ability to raise chicks. Hens can raise 4 or more clutches of chicks a year but the survival rate of chicks is low. On average only 2 or 3 out of 10 chicks per clutch will survive to reach usable size. Main problems are predation by birds, wild cats and other wild animals, and in some areas disease.

11. Apart from traditional chickens, some farmers keep so-called "commercial chickens" Broiler-keeping is still promoted by the government and numerous development projects, but has failed on a grand scale. Some farmers keep broilers (we saw some grown birds) for the "young people" and for eating, much in the traditional way. Broiler chickens cannot be bred by farmers, so young chicks have to be bought to replace them. This should not be promoted.

12. Dogs are men's' animals (often cared for and fed by women) and used for guarding and hunting, supposedly in all areas. At Msinga they are also used for driving cattle or goats. Hunting dogs can be of high value and may fetch a price of several thousand Rs. Hunting may be illegal and therefore is not discussed openly. Specialised dog breeding is done by a few people, but is an activity which does not need further support

13. Donkeys are being kept for ploughing and transport, in some areas, but their cultural status is very low. It is interesting that in the Diocese areas donkeys are regarded as women's animals whereas at Msinga they are men's animals (but of low status). Although they could fit into communal farming systems the cultural resistance against them makes them a low priority for the projects.

14 Sheep are men's' animals, used for meat, money and traditional slaughter. They are obviously declining in importance. People keeping wool sheep around Reichenau, complain that they do not have any outlet for their wool and, in the Mdukatshani area, where some traditional Zulu sheep are being kept, bush encroachment has changed the environment to such an extent, that sheep-keeping has been given up as a response. People in some areas indicated that they like mutton, but buy it from the butcher.

15. Geese are used as watch-dogs and for meat, ducks (muscovy) for meat, turkeys – as a kind of super large chicken, for meat, sales and it is known that they also can be watchdogs. In one case (Reichenau) a farmer also keeps pigeons. These "other birds" are thus far rare but could enrich the animal portfolio. Turkeys – if they can be prevented from straying away from the homestead could offer additional income. At present a turkey fetches Rs 150 on the market, which is almost half the price of a goat.

16. Presently manure is only used sparsely or not at all. As many fields are already permanently cropped a decline in soil fertility and crop yields is to be expected. During the dry season, maize fields in particular, are grazed, manure and urine deposited during that time may help recycling nutrients from the stalks, but is not sufficient to offset nutrient exports from the fields through crops. Manure from kraals, which is presently not used, could help to increase yields. Manure has been tried out in vegetable gardens and on fields at St Bernard's since 1998 and at Maria Trost since 2001 in the Diocese project together with farmers, and plans are under way to, try manure on dryland in the Msinga area, where it is a revival of an old practice

17. 1 Marketing of livestock and livestock products is presently largely restricted to local markets, although some farmers have sold cattle on auctions. In fact it looks as if in the Diocese project areas, livestock is imported into communal areas from commercial ones, not only for eating, but also for cultural slaughter and for lobola. This indicates that demand outstrips supply within the communal areas.

17.2 Trade includes swapping of livestock. For example if an animal is needed for slaughter 2 heifers, some goats or even a healthy cow may be swapped for a cow whose udder is damaged. Similarly oxen may be acquired through swapping rather than using an animal with reproductive potential.

17.3 There are several reasons we can make out for not marketing outside the community, tribal lands or the communal areas:

- Prices. The prices demanded by the sellers for cattle can rarely be achieved at auctions, goats are apparently traded only to a limited extent (at least within the country) and live chickens sold on pension days or to neighbours fetch higher prices
- Distance from marketing facilities. Farmers may have to travel quite a distance to auction rings, whereas announcing the intention of selling an animal on dipping days, or spreading word in the neighbourhood, saves the trip and the expense
- Mistrust of the auction system. This may be justified or not, but farmers believe that they do not get a fair deal at auctions.

18. Crop production is for some people more important than livestock, and 'for others crops and livestock are closely linked (draught animals, straw as feed). When promoting crops other than vegetables, emphasis should be placed on dual-purpose crops. At present, the "large farm" past of agricultural research and extension in South Africa offers little in this respect, nor has much emphasis been placed on drought-tolerant crops.

18. Although many elements of South African agricultural policy do not favour a step-by-step development of largely local market-oriented subsistence livestock-keeping, support measures for farmers in the project areas do have to take into account the institutional environment. Support measures should be agreed upon and coordinated not only with farmers, but also with the Department of Agriculture, most particularly with its extension and veterinary services. However communal farmers should not be force-fed packages of interventions, but offered a basket of options, which need to be scientifically sound and jointly further developed.

18. Our study shows a number of entry points into such a system:

- Training of what could be called community-based animal health workers (cattle, goats and chickens)
- Mineral supplementation of livestock (any data on mineral status of forage in the St Bernard's/sourveld area?)
- Planting of fodder crops (most urgently winter forage) particularly for cattle in some areas.
- Promotion of the use of breeds adapted to the respective environment (Nguni cattle, local savanna goats, local chickens)

- Further exploration of suitable dryland and irrigated crops.

19. Any improvement in veld management should be approached with great caution. Firstly the carrying capacity model of the department ignores important less-than-20-year-old findings of research (where often South African researchers are at the “cutting edge”). Secondly veld management needs to rely on robust institutions within the communities, and it is doubtful whether such robust institutional arrangements are in place.

1. Introduction

South Africa has a very productive system of agricultural research, which in the past helped greatly in developing technology for large-scale commercial farms. Production from such farms, e.g. dairy farms, compares favourably with that from commercial farms in industrialised countries. The theory and practice of range management in Australia and the United States has been strongly influenced by scientists in South Africa, where selection of forage plants is advanced and seed companies operate not only on the national but also on the international level. The strong concentration on large-scale, commercial farming means, however, that the agricultural research and extension services in South Africa currently offer little specifically for communal smallholder farming, whether in crop or livestock production.

Two projects in Kwazulu-Natal (KZN) supported by Misereor – the Rural Development Project (RDP) of the Diocese in Marianhill and the Mdukatshani Rural Development Programme (MRDP) had been working on land reform, trying to hand back to black communities either church held land or former commercial farms. Although this process is in no way concluded, it has already become obvious that simply handing over land and giving land titles to groups of people or individuals is insufficient to achieve rural development. Advice on how to manage land, crops and possibly animals was deemed necessary. In 1998 the Diocese RDP started supporting cropping activities (vegetables, dryland crops) at St Bernard's and later also in other areas. Mdukatshani has also been supporting cropping activities (for 25 years off and on) and has already produced a study on "Cattle and goat owners at Msinga" (Letty *et al* 2002).

A larger study was conceived to gain better insight into animal production systems in the project areas. More specifically, the study was supposed to look into:

- what people in the project area are presently doing with their livestock
- the reasons why they keep livestock and which types of livestock
- what level of livestock productivity is achieved
- constraints on livestock production
- issues around marketing, conflicts etc
- possible measures of investment, technical and organisational support.

The study was carried out by the respective project teams with the support of an external consultant in August/September 2003. [His itinerary is given in Annex 2](#)
[Wolfgang this is no longer attached.](#)

We would like to thank the farmers of Maria Trost, St Bernard's, Reichenau and Msinga who endured our farm visits and interviews during community workshops; to the women who cooked our midday meals during the workshops; to the priest [should he be named](#) at Maria Trost for his hospitality; to Thelma Trench who guided us so skilfully during the planning sessions for the study; to Brigid Letty who, although between jobs, took a keen interest in the study, participated in the planning and final discussions, and joined us for one day at Msinga; and to Creina Alcock, who – apart from her warm hospitality – provided very detailed background information on the Msinga area, particularly to the consultant, and asked so many pointed questions that the study was certainly improved as a result. Any possible misinterpretations are, however, clearly the responsibility of the study team.

2. Study areas and methods used

2.1 Study areas

Reichenau is the first community in which the Diocese was able to transfer land to a Community Property Association (CPA). Reichenau is an 800 ha farm located in the Drakensberg area with 100 families residing on the land. Most of the land is used for extensive grazing. Reichenau is also blessed with another development project, which supports beadwork, human nutrition and ecotourism.

St Bernard's is a 535 ha farm located in the Natal Midlands close to Richmond / Pietermaritzburg, with 135 families residing on the land. The process of transferring the land to the community (CPA) is not yet concluded. There are a number of groups active in the community, such as a Pastoral Council to help the priest with his pastoral work, a Land Committee that determines who can settle on the farm and where, a CPA Committee that has already worked out a constitution, an Area Committee which works with local politicians, and a Livestock Committee that manages the dip tank and is also supposed to deal with grazing management.

Maria Trost is a 315 ha farm located in the southern hills of KZN close to St Faiths Mission, with 19 families residing on the land. Neighbouring farmers participate in the project activities.

All three communities have chosen the CPA as the form to manage the land after the transfer. In a CPA, the community elects a committee that manages the land for the community. People did not opt for private titles. They stated very clearly that they wanted to have an opportunity to improve their homesteads (house, garden, fields) and to manage the other areas (grazing land, forest, water resources) in a communal system.

Maria Trost and St Bernard's are situated in the coastal belt (close to timber and sugarcane plantations), whereas Reichenau is close to Underberg, in a farming area at the foot of the Drakensberg. All three locations receive above 1000 mm of annual rainfall, but the winter can be dry. The intentions of the Church are to give the land to the communities that are already living on the land. In this respect, the communities are privileged, as other communities in the neighbourhood of each project area do not have the same prospect of secure land titles.

In contrast, **Mdukatshani's** area of work is situated in a drier region, straddling the Weenen/Msinga districts with 600–700 mm average annual rainfall. Local communities differ in their proximity to water, their access to grazing land and their endowment with cropland. Some farmers also have access to irrigable land (near the Tugela River). The Mdukatshani farm comprising 2500 hectares was initially purchased to enable labour tenants and surrounding tribal communities to maintain access to land. Many people were – until five years ago – settled across the river in a governmental resettlement scheme called a “location”. When land reform became available many families decided not to relocate their homes but to stay where they were on ‘locaton’ land and utilise the grazing and ploughing lands from there.

In all study areas, the households have multiple sources of income: pension, taxi-driving, other transport businesses, employment and/or remittances. Thus, animal

husbandry has to be viewed not as an independent enterprise but as part of a wider household livelihood system.

2.2 Methods used

As a first step, [the Terms of Reference \(see Annex 3\) Wolfgang these are also no longer included?](#) were translated into concrete steps during a discussion between the two project teams and the consultant. Here, workshops with communities and farm visits were planned.

During the farm visits, observations were made on pasture condition, species and condition of the animals that could be seen, the kraal, chicken nests etc. Semi-structured interviews were conducted about management of different livestock species. More details about the approach are given in Annex 1.

In each workshop, the first step was to compile a matrix in which people could indicate the species of animals they keep as well as why they keep them. People were asked whether a particular animal species was managed by men or by women or by both.

Each person was given five beans, grains of maize or other items suitable to be placed on the matrix for scoring the importance of a particular animal species for a particular function, if this function could be fulfilled by more than one species. Men and women in each case were given different items (e.g. white beans to men and red beans to women).

As a second step, the management and productivity of selected animal species was discussed with the group. This included feeding, breeding, animal health care and marketing.

As a third step, forage calendars (mainly for cattle) were compiled based on discussion between livestock keepers and the study team.

Whenever it appeared to be appropriate, the consultant or members of the study team gave the community short inputs on breeding, feeding or other technical issues.

Team members took notes during the workshops and farm visits, and at the end of each day the study team met to discuss the day's findings.

Towards the end of the consultant's mission, the study team visited agricultural services to discuss the preliminary findings and to explore possibilities of support for particular interventions from the livestock sector. With a view to the greatest possible sustainability and impact of these interventions, it is mandatory that the Department of Agriculture (DoA) and/or the Department of Veterinary Services (DoVS) agree with and support the interventions that are proposed to the communities. In addition, visits were paid to an Nguni stud breeder, the Stockowners' Association and a seed merchant to explore possible support from the private commercial sector.

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The findings were further discussed at a meeting with the Mdukatshani Advisory Committee, in which other groups from the NGO network, Midnet and four members of the Diocese RDP also took part.

The findings and possible implications for future project activities were then discussed with the project teams. Feedback to the community has not yet been given in full, as the project teams felt that a broad consensus on approaches and general direction of the interventions would need to be reached between project, Department of Agriculture and donors, before the community became involved in more detailed planning.



Msinga women giving their opinions on chickens



Wolfgang explains the forage calendar



Pilani giving Richanau farmers the means to vote



Lihle adds up the vote

3. Findings

3.1 The settings

The locations differ remarkably with respect to education of farmers, their proximity to official markets and their affinity to tribal traditions.

Although certain traditions such as animal sacrifice or paying *lobola* (bride price) have been retained, the least traditional area is Reichenau. Levels of education are comparatively high (when one of the translators had to go to the doctor during the workshop, the farmers offered to continue in English), commercial farms are very near, ploughing is almost entirely mechanised, and farmers own tractors and other machinery (including one farmer with a truck).

Maria Trost and St Bernard's are intermediate. The villages and farms are more difficult to reach and – although commercial farms are nearby (some of the farmers at St Bernard's started growing sugarcane this year) – links with commercial livestock farmers seem to be somewhat weaker.

The most traditional area is Weenen/Msinga, which in itself has a range of different settings: farms where livestock can range freely, with little sign of cropping; settlements with cropland fields nearby, where the systems are agropastoral with relatively large dryland cropping areas; and areas where crops can be grown under irrigation. Commercial farms have an important indirect influence, because many of these black farmers were, or descended from, labour tenants. As far as services and marketing out of the area are concerned, however, Msinga appears to be the furthest away from a commercial farming system.

3.2 Livestock species being kept

As had been expected, the types of animal kept and the systems of animal husbandry differ between the areas. Species common to all areas were cattle, goats, chickens, dogs, cats and donkeys. Donkeys were a difficult species to investigate, since people would seldom admit that they keep and use donkeys – it was almost always “other people” who did so. Species that were kept in a few cases only were geese, ducks, turkeys, pigs, sheep, horses and pigeons.

There were also fairly clear-cut lines with respect to management responsibilities between genders. Cattle and goats are the responsibility of men, chickens are typically managed by women, although men may “have their names” (i.e. own) chickens received, for example, in return for making and fixing an axe handle. A distinction is made between indigenous chickens and so-called commercial chickens (broilers). Commercial chickens are clearly men's animals (although women may feed them).

Pigs and dogs are owned by men, but women are involved in feeding and caring for them. Donkeys are regarded as women's animals at St Bernard's and Maria Trost, whereas they are men's animals at Msinga. The matrices of livestock species and functions for the different study areas are presented in Annexes 2-1 to 2-4 with local opinions on who is responsible for caring for a particular species.

3.3 Cattle

Local people regard themselves as “cattle-keepers”, even though not all households keep cattle. At Maria Trost, only nine of the households presently living on the farm keep cattle. During the Msinga workshop, among the 15 households that volunteered information on their cattle holdings, three did not have any cattle. At Maria Trost, farmers said that the average cattle holding is ten head. At Msinga, two households had less than ten head of cattle, five households had 10–20 head, and five households more than 30 head. The largest cattle holding encountered was a farmer with 73 head at Reichenau. According to farmers, 100 head of beef cattle or about 20 head of dairy cattle are needed to earn a living exclusively from cattle. Thus, none of the farmers interviewed can rely exclusively on cattle. Cattle are very much the animals of men. At Msinga, a woman is reportedly not allowed to enter the kraal (only older women may be given a special status and thus have permission to do so). Farmers at Maria Trost complained about a range of different problems that they blame on the fact that the women are now handling the cattle.

3.3.1 Functions of cattle

Farmers referred to a range of functions for cattle:

- **Producing milk and meat.** The milk is predominantly used within the household; only farmers at Maria Trost said that they sold milk (fresh milk is sold at Rs 2 per litre and is thus cheaper than pasteurised milk in the shops). Cattle are rarely slaughtered just for consumption, but meat from animals that have died is eaten. Milking is done once per day (morning or afternoon). The figures for milk yield quoted by the farmers appear to be very high (with an extraction of up to 5 l per cow per day, the calf would probably suffer) and it is also not clear what a household, even if it has 10 members, would do with so much milk if they do not sell it. Milking is generally stopped during the winter or dry season.
- **Ritual slaughter.** There are numerous occasions for ritual slaughters, at weddings, at funerals, one year after a funeral, when somebody comes back from prison etc. The meat is shared by tradition with neighbours and relatives, who come without having to be invited. Different cuts go to different groups during the ceremony, for example, the head can be eaten only by men in the group to which they pay allegiance.
- **Sales and savings account.** With banking services being far away, major expenses are covered by selling cattle. One farmer at Reichenau explained that selling a bull paid a large part of the construction costs for his house. Cattle are often sold to cover school fees. Common arguments against selling animals, other than in times of need or emergency, are that farmers are in the process of building up a herd and will start selling once the herd is larger than 10, 20 or 30 animals, depending on the region.
- **Lobola.** The traditional bride price (11 head of cattle) is paid in cattle. Heifers are preferred, but cattle can be exchanged for goats (4–6 goats for one head of cattle or sheep, or money can be paid instead). Although some people (often white people) complain that *lobola* is said to be archaic and “selling a daughter for money”, this tradition is said to be a means of lowering divorce rates. If the man is found guilty of being unfaithful and is the reason for divorce, the family of the wife’s father does not pay back the *lobola*. We were told that a couple could live

together after an instalment of the equivalent of three head of cattle has been paid. The full amount can be paid over a number of years but, at least at Msinga, children belong to the family of the bride's father if the *lobola* has not been paid in full, or at least to a large part. Furthermore, it appears as if the full amount is rarely paid nowadays. Interviews conducted at Mdukatshani suggest that the average lobola has declined from close to 11 cattle for women born in the 1930-s to slightly more than 3 for women born in the 1970-s.

- **Traditional attire.** According to traditional law, married women (at Msinga) have to wear leather skirts, but skirts made from cattle hides are very heavy. They are increasingly being replaced by goatskins. Leather skirts are a kind of wedding ring for tribal Zulu women.
- **Draught.** Using animals for draught includes not only ploughing and weeding. At St Bernard's, both men and women reported that cattle are also used to transport water and firewood (on sledges).

Functions not mentioned by farmers during the interviews included tribal fines and status, which were mentioned in the earlier Mdukatshani report (Letty *et al* 2002), as well as manure. When these issues were raised for discussion, farmers explained that, although these functions can be important for some people, they occur very infrequently and were therefore not mentioned. The previous study found that status was the least important of the benefits derived from cattle. The fact that farmers did not mention manure probably indicates that agropastoralism is still developing. Trials with use of manure in vegetable gardening and cropping are underway in both projects.

3.3.2 Cattle feeding

Cattle graze year-round on natural grassland/rangelands (rangelands at Msinga are heavily "bushed"). After harvest, maize stubble is grazed during most the dry season but becomes low in forage quantity towards the end of the season. Apart from some farmers at Reichenau, none of the farmers offer salt or other licks to cattle. There is a wide range of so-called feeding blocks available on the market, most of which are expensive and not specifically made for use in small-scale communal farming. This may indicate that supplementation in commercial systems is solving "problems" that do not exist or at least not in the way for which the blocks and licks were designed.

Some farmers at Msinga bring their cattle onto commercial farms during the winter and pay a grazing fee of Rs 10–20 per month. This can be an economical proposition, particularly if the pasture in question is a Lucerne field.

Many farmers have a grazing area for the wet season and one for the dry season. During the wet season, cattle are kept in the kraal near the homestead and released for grazing late in the morning, after the dew on the grass has dried. Some scientists may regard this practice as counterproductive, since it restricts grazing time. There is, however, little hard evidence that forage intake is severely restricted by this practice. Studies in Zimbabwe and Nigeria (cf. Bayer & Waters-Bayer 1998) showed that animals make up for restrictions on grazing time by eating faster during their time on pasture. Veterinary studies confirm that a late start of the grazing day reduces worm infestation of cattle, as worm larvae have to go into hiding or dry up if they cannot hide once the dew is gone.

During the dry season, cattle are often herded to an area further away, where there is still some forage left. They may not return to the kraal for the night and in some parts of Msinga, are brought to water only every second day. This can involve walking to the river for 5 km and 5 km back. In comparison with pastoral systems in other parts of Africa, these distances are short. Herding is not the very tightly controlled herding that can be observed in parts of West Africa. It consists, rather, of releasing the animals and vaguely directing them to a particular area and then letting the animals decide where they want to go to graze or browse, and where they can intermingle freely with animals from other farms or even other villages.

Given the importance of natural range for cattle nutrition, the nutritional status of the animals is closely linked to veld conditions. These can be described as follows: after the spring rains (September/October), the young grass is palatable and highly nutritious, and animal condition improves rapidly. In the summer, the grass continues to grow but becomes coarser. Animal condition still improves but the rate of improvement slows down. Animals continue to grow throughout the summer until April/May, when growth stagnates. During the winter (June–August), the condition of the animals declines, and July/August (at Msinga also September) can be a problematic period for animal nutrition. This is aggravated by the fact that many calves are born towards the end of winter (commercial farms plan calving for this time, because the good-quality spring forage allows the cows to produce more milk when the calves' needs are greatest: 6–8 weeks after birth). During a meeting at Msinga, farmers said that some cows giving birth at the end of the winter can no longer stand up. This could be a general weakness, but may also be due to the mineral status and the nutritional state of the animals.

The animals and the people are already doing something to counter this late winter depression in animal condition. Cattle may switch from grazing grass to browsing leaves and pods from trees and shrubs, despite the thorniness of many *Acacia* species. Other well-liked forage trees are the African olive (also valued by people because of its hard wood), some *Boscia* species and *Schotia brachypetala*. Forage trees are of great importance at Msinga, but are almost totally absent from the sugarcane/timber plantation country of the coastal area and in the foothills of the Drakensberg near Reichenau. Here, fire offers some relief for the animals: after burning, the perennial grasses show new green growth and the green shoots are good in forage quality. However, the quantity of this forage is low.

In some years, like this year, the shortage of forage at the end of the winter is so great that animals will die. Therefore, filling the winter gap with some cultivated forage, or with stored fodder, that can be used strategically would help to enhance animal production and make it more “drought-proof”. Some of the options are discussed below under “Possible support measures”.

3.3.3 Cattle health care

Preliminary results of a recent study by the DoVS (data not yet fully evaluated) on disease prevalence in communal or tribal areas in KZN lead to the conclusion that the tribal areas are in no way the disease-ridden sources of all evil, as some people liked to believe.

Cattle mortality on account of starvation or disease could not be investigated in greater detail in this semi-quantitative study. Given the value of cattle (monetary and social), the loss of even one animal is felt as a great loss for a farm household. Farmers therefore try to do something to prevent such losses.

Animal health initiatives are also faced by a division of labour between state Veterinary Services, which are in charge of monitoring and controlling classified diseases such as foot and mouth disease (FMD), anthrax, rabies etc, and the private sector, which treats the non-classified diseases and provides curative treatment, when requested.

In the different study areas, the strategies for animal health care also differ. Farmers avoid or reject herbal and other indigenous means of treating disease and say that they rely on modern medicine. At Reichenau, which is close to Underberg, farmers can consult the local veterinarian and claim to do so. In contrast, people in other areas further from major towns have no veterinary service close by and have to rely on their own initiatives. Farmers buy vaccines and antibiotics and inject their animals themselves. Here, we see a number of problems. Firstly, the dosage used by the farmers is only approximate, partly because many farmers, especially at Msinga, cannot read and write. Many drugs and vaccines have to be kept cool, which is difficult or impossible to do without refrigeration. The size of the packages also poses a problem, as they are tailored for large commercial farms and not for smallholders. Even if the medicines are stored and dosed correctly by the smallholder household, the drugs in such large packages will reach their expiry date well before they are used up. Therefore, the modern medicine is, in many cases, not effective. Indeed, antibiotics that are only partly effective actually speed up the development of bugs resistant to these antibiotics.

The single, most important animal health measure is tick control. Here, government policies over the last 15 years have been somewhat contradictory. The pre-1994 government provided dipping services free of charge, and made it compulsory. Dip tank records thus also provided a basis for a livestock census (and stock theft control), and at least the dip assistant or inspector knew approximately what was going on in the livestock sector in his area. The post-apartheid government first abolished compulsory dipping – some trials with the Nguni breed of cattle suggested that dipping is not always economical – and then abandoned the free dipping policy. Many dip tanks closed down. Farmers were left to fend for themselves and started buying a pour-on or using a hand sprayer. The 2002 study of cattle and goats at Msinga revealed that farmers more often buy pour-on or dipping chemicals as individuals. Although they had observed mixing of the solution and application of pour-on or use of the dipping chemicals when the dip inspectors or assistants did it, the farmers never received any formal training, and it is likely that they are not using the dipping solutions according to specification.

More recently, the government changed its policy again and is in the process of reintroducing dipping groups and re-establishing dip tanks. On account of the heavy costs involved, this policy may not be sustained in the long run. On the other hand, the state-decreed dipping groups may offer an entry point for establishing and strengthening livestock development groups.

In the past, dipping was not only an animal health measure, but also a social event. Intentions of selling an animal could be made during dip day. Boys who brought the animals to the dip tank encouraged bulls to fight with each other.

Farmers are very aware of the danger of ticks, which can transmit heartwater (deadly for introduced breeds and a strain for the indigenous breeds) and other diseases, such as redwater (babesiosis). The most common vaccination is against blackquarter. Dipping is done fairly frequently: every 2–6 weeks, according to farmers at Msinga. The tick load has a pronounced seasonal trend, with most ticks – including the big and dangerous *Amblyoma* tick, which transmits heartwater – occurring in spring and early summer, and far fewer ticks in autumn and winter.

A general note of caution must be made. Dip solutions are poisonous. Most manufacturers claim that there is no waiting period after dipping for both milk and meat. However, the instructions for effective pour-ons for dogs and cats from the same manufacturers that produce Dead-line (the common pour-on used by farmers) state that these should be used only for animals not used for human consumption. Furthermore, dip solutions have to be carefully managed. If the same brand of solution is used for several years, ticks become resistant to the acaricide. Underdosing accelerates development of resistant strains of ticks. In other countries, it has been found that the lifespan of acaricides has been decreasing over the last few decades; in other words, the development of resistance in ticks against a particular acaricide is accelerating, and acaricides need to be changed more frequently. Drug manufacturers are reluctant, however, to develop new acaricides because of the ever-shorter “pay-back” periods. Finally, the disposal of the spent dip-tank solution can be an environmental hazard.

3.3.4 Cattle theft

A very important reason for cattle loss is theft. The government encourages the use of branding, and brands are registered so that live animals can be more easily traced (The Agricultural Research Council – ARC – offers a service of genetic fingerprints for livestock but, in view of the logistics required for this purpose, it is doubtful whether this service can be of use in communal areas.)

Another community-based measure is not allowing the bailing out of people arrested under suspicion of cattle theft. People who pay bail for suspected cattle thieves are threatened with death by the community, at least at Msinga. This may not be acceptable according to some societies’ understanding of law and human rights, but it is a measure that seems to be reasonably effective against cattle theft at Msinga. Some vigilantism has been evident: for example, four alleged stock thieves on the Mdukatshani Top Farm were recently found dead and propped up against a tree.

3.3.5 Cattle breeds and breeding

Breeds. Most of the cattle in the study areas are not purebred. Farmers describe them as a fairly unspecified mix. One farmer at Maria Trost keeps Nguni-Jersey crosses and wants to set up a dairy unit, but complains already that the crosses need more (and better-quality) feed than the indigenous cattle. Another farmer at St Bernard’s keeps indigenous x Hereford crosses but admits that they have more ticks than do other cattle breeds.

It is generally agreed that high-performing dairy cattle, such as Holstein-Friesian, Ayrshire or Jersey, are out of the question in the communal areas, because they are too difficult to manage. A bull kept by the Maria Trost mission appears to have had some influence on the local cattle population. It was probably a bull of a German breed – perhaps Gelbvieh or Rotvieh – but this could not be determined clearly from the description given by the farmers.

A breed that is much talked about in the communal areas is the Brahman. This improved zebu breed is large-framed, tick-resistant, can cope with low-quality feed, but is also known for its late maturity and its temperament. Cows cannot be milked, and oxen and bulls cannot be used for draught (or only with difficulty).

The most common cattle breed mentioned by the farmers was the Zulu, but they could not agree on a common description. Zulu cattle are said to carry few ticks, produce good meat, be capable of coping with low-quality feed and be strong when used for draught. It thus seems to be an ideal animal. According to ARC staff, the Zulu comes close to the Nguni or is practically identical with it.

On the Diocese farms, the inhabitants had heard about Nguni cattle, but thought them to be small, weak and – in any case – something for white farmers. Few of the communal farmers had visited an Nguni stud farm or had even consciously seen Nguni cattle. This impression was confirmed when we visited an Nguni stud farm together with a farmer. When pictures of Nguni cattle were shown to farmers in the Msinga area, they immediately recognised these as “cattle that were kept by our fathers”. In fact, the Msinga farmers keep cattle very similar to Nguni.

Reproductive performance. The reproductive performance of cattle differs greatly between areas. It is low at Maria Trost and St Bernard's, where farmers complained about the late age of first calving (4–5 years or more) and the long calving intervals (2–4 years). Reproductive performance is high at Reichenau and Msinga. At Reichenau, farmers said that heifers come into heat and are “followed by a bull” sometimes when they are less than two years old, which would mean that age of first calving is less than three years. They expect cows to give a calf every year and farmers with large herds may cull cows that miss calving more than once. However, some farmers at Reichenau use not only mineral blocks but also a range of other feeding blocks (molasses/urea or molasses/grain or more complicated feed mixes available in shops), which may contribute to better reproduction. Although animals graze on communal pastures and cows and heifers are not segregated from bulls, the availability of bulls can be a problem. Although a kraal with more than ten cows and heifers should have a bull, even the farmer with 73 head of cattle did not have an adult bull at the time of the interview. The ratio of bulls to cows and heifers on commercial (beef) farms is 1:25.

Box 1: Nguni cattle - an indigenous breed with commercial merits

Nguni cattle are relatively small-framed, with stud cows weighing 400–450 kg (large-framed breeds have a cow weight of 700 kg or more). They are early maturing, are highly fertile, can cope well with low-quality feed, have a high degree of disease tolerance/resistance and are also highly resistant to ticks. At Dohne Research Station, there is a herd that has not been dipped for 40 years. The Nguni are fairly docile animals and are used for draught, milk and meat production. Their colour can be quite variable. The multi-coloured skins currently have a high value, but colours in calves are unpredictable. According to different sources, there are either 48 or 92 different colour variations, each with a Zulu name. Because of the marketing system (bonus price for large animals), possibly the old commercial farm value for large-framed animals and some cultural value attached to large-framed animals, many communal farmers would like to keep “non-Nguni animals” such as Brahman. However, these animals are not as productive under low-external-input conditions as are the Nguni.

Nguni cattle are mentioned in the FAO book on endangered breeds (Scherler 2000) but, according to another source (Bester *et al* 2001), there are more [Which means a population off ?](#) than 12,000 cows in stud herds and large numbers of almost pure Nguni animals are kept in communal areas. On some commercial farms, Nguni cattle enjoy popularity because they are easy to keep with very few external inputs and, at that level of inputs, are the most productive breed.

At Msinga, there are reportedly two calving seasons: late winter and mid-summer. Many cows have a calf every year; sometimes there are 1.5 years between calves. First-born heifers normally conceive at the same time that their mothers conceive after having given birth to the second calf; this would be at the age of 2–2.5 years. Age at first calving is 3–3.5 years. This performance matches the performance on commercial farms and is far better than anything found in other studies of cattle-keeping in communal areas.

The low performance at Maria Trost and St Bernard’s needs attention. At present, we can only speculate. The veterinary study suggests that disease is not likely (but this needs to be crosschecked). During the Mdukatshani Advisory Committee meeting, the possibility of a mineral disorder (iodine) was suggested; iodine deficiency can cause reproduction failures, according to ARC (1980). This would also need to be crosschecked but, if it is the case, could be rectified with an appropriate salt lick.

Selection of breeding stock. This has to go through the female line, as the father of the calf is often not certain. At St Bernard’s and Maria Trost, the low fertility rate and small size of herds leave little scope for selection among females, but male offspring can be selected on the basis of the performance of the mother. At Msinga, the farmers mentioned the following criteria for selection:

- mother’s age at first calving
- regular calving of mother (preferably every year)
- milk yield of mother
- no difficulties with calving
- good mothering ability.

Farmers with comparatively large herds at Reichenau have similar selection criteria, except that they also stress the size of the bull, a criterion not mentioned at Msinga.

For the final selection of a breeding bull, size and physical appearance are also important, and libido is observed. A bull with a weak libido will certainly be replaced. The other males are castrated. The time of castration is open to debate. Calves are rarely castrated – people feel sorry for the “poor animal”. Animals that are castrated early will grow large, but are less well muscled and can become fat more easily than bulls. They are the preferred draught animals. Bulls are not used indefinitely. At Msinga, they are used for breeding for 3–4 years and then castrated. Farmers give several reasons for this. Old bulls become a nuisance (they are more difficult to manage and can become aggressive) and their meat becomes less palatable. Several methods of castration are known, but the most common one appears to be the use of the Burdizzo castrator. Some people have bought a Burdizzo castrator and will also castrate also other animals in the neighbourhood for Rs 20 per castration (the fee is the same for cattle, goats and donkeys). This is one of the few occasions when services between neighbours at Msinga are paid in cash.

At present, it is more likely that there is a shortage of bulls, rather than too many. The general opinion is that someone with more than ten cows/heifers should keep a bull, but even owners of fairly large herds do not always keep a bull. At Msinga, one cattle owner keeps four bulls and provides a breeding service for the community. However, payment for the service of bulls seems rather alien to local farmers. Some even joked that the bull should pay *lobola* if he approaches a heifer.

3.3.6 Draught

Draught power is one the most important reasons for keeping cattle. Animals are trained when they are 2–3 years old and can be used for 5–7 years.

Oxen are preferred for draught, but cows (preferably dry cows), bulls and even large heifers are used “in the span”. If bulls are used, young animals are preferred, since old bulls become more difficult to handle. During the ploughing period, which lasts for 6–8 weeks, animals are worked for 4–6 hours a day and for 4–5 days a week.

One of the particularities of South Africa is the use of large teams for ploughing. Farmers said that they use 4, 6 or 8 cattle in ploughing teams. Even in the Diocese area where cattle holdings are small, teams of 4 or 4 animals are used. When asked why such large teams were used, cattle owners pointed to the heavy soils (which can be found in other countries as well, where teams of two or even single animals are – or, in Europe, were – used). What is more likely is that draught animals were introduced by the white commercial farmers, who used large teams for comparatively heavy equipment. Communal farmers took over these practices. Large teams have a number of disadvantages: they are more difficult to manage, they are not particularly efficient (as the size of the team increases, each animal gets less power to the ground) and, to make sure that large teams are reliably available, cattle holdings need to be fairly large. Smaller teams and lighter equipment may mean that a farmer has to spend more time cultivating a particular field, but he may need a herd of 10–12 head of cattle instead of 20 to be sure that sufficient animals are available for particular tasks. Furthermore, large teams are needed only for ploughing (which, at least at Reichenau, is now often done by tractor). For subsequent cultivation measures, such as weeding, teams of only two animals are needed.

It is official government policy to support ploughing by tractor. South Africa differs from other sub-Saharan African countries in important ways: tractors and services for tractor maintenance are available in the country and tractors are comparatively cheap. Second-hand tractors can be bought already for Rs 30,000–40,000, which means that they cost little more than a team of eight cattle. Community members do tractor ploughing for other community members for a fee, which determines also the fee to be paid if contract ploughing is done by draught animals. Contract ploughing appears to be common at Reichenau, with similar prices per unit area for tractor or animal ploughing. At Msinga, ploughing for other community members is done free of charge if the customer is a widow, and is subject to negotiations if done for male-headed households.

3.3.7 Marketing of cattle

Cattle are presently sold mainly in the neighbourhood or within a radius of about 20 km, if they are sold at all. According to farmers, the common procedure is to make known, e.g. on a dipping day, the intention to sell an animal, and then the seller waits until a buyer comes forward. Prices asked are reasonably high: Rs 3000 for a cow and Rs 2000 for a heifer, whereas a large ox may fetch up to Rs 5000 or even more. In comparison, a stud Nguni heifer costs about Rs 3000 on a commercial farm, and a bull Rs 5000–7000. In the traditional context live animals are worth more than just the meat, because the killing opens a communication pathway with the ancestors.

Cattle are also exchanged. If the udder of a cow is damaged so that it cannot feed a calf anymore, this cow can be fattened up and then swopped for a heifer or two, a healthy but leaner cow, a bull, or 4–6 goats. The buyer may use the cow with the damaged udder for sacrifice. Similarly, a bull or an ox can also be swopped to acquire reproductive cattle.

Hardly any communal farmers sell at commercial auctions, where it is a common for commercial farmers to sell their animals. The communal farmers gave three reasons:

- Auction rings are far away and animals need to be transported there. If not sold, the farmer has to take his animals back – and has spent his efforts and transport money for nothing.
- The prices offered at the auctions for animals from communal areas are below what can be obtained in the neighbourhood.
- Speculators tend to be unfair to communal farmers, who claim that the market is “rigged”.

No bank could be found in any of the study areas. At Maria Trost, did farmers express an opinion on the subject? the next bank was reportedly 40 km away. Under these conditions, it is difficult to keep cash at hand and, although having money in the bank is regarded as more profitable than some years ago, the access to cash might be easier if wealth is stored in an animal bank and not in a money bank. (Comment related to?)

Under these conditions an animal becomes a bank, a source of cash on hand. Although farmers indicated that having money in the bank was now more acceptable than a few years ago the distance/transport costs of getting to a bank created real problems. (as a poss. Alternative)

A major outlet for cattle is related to culture. If a farmer can pay *lobola* for two sons from a herd of 20 cattle in 4–5 years, this herd must be highly productive. The 11 head of cattle for a full *lobola* are preferably heifers 1–2 years old (there are indications that the real number of animals paid for *lobola* has declined over the last decades). Ritual sacrifice related to the death of a family member is another major pathway of extraction from the cattle herd. At Maria Trost and St Bernard's, animals for "customary slaughter" are also bought from commercial farms. There are some indications that more cattle are brought into these communities for consumptive (including ritual) use than are exported from the communities.

Some outsiders may regard customary use as irrational. We cannot agree with this opinion. Although we do not have data on the exact extent of transactions, it appears that customary use is not only a major way of using cattle from within the communities but also means good business for commercial farmers. Some commercial farmers reportedly advertise *lobola* heifers, and the sale of animals for customary slaughter certainly provides an income for some farmers. We are not aware of any economic study that has been made on this. If no such study has been done, it would be a very worthwhile exercise for development-oriented research in South Africa in general and KZN in particular.

3.4 Goats

Goats are kept in all four study areas, but goat ownership is not as widespread as is cattle ownership. At St Bernard's, out of the 19 households present at the community workshop, three did not keep cattle, but seven households did not keep goats. Goats, like cattle, are the responsibility of men, although some widows and older women manage goats as well. The size of the flocks varies according to study area. At Maria Trost, none of the farmers present kept goats and the male farmers wanted to discuss chickens instead of goats. At St Bernard's, farmers complained that it is difficult to breed up large flocks of goats and said that flock size was between 2 and 12 animals. Often, when a flock has been built up to 10 or more animals, disease strikes and animals die. At Msinga, larger flocks are kept – up to 40 head or more.

A main obstacle to keeping goats is stock theft. One farmer at Msinga with 40 goats complained that 25 were stolen last year and that more than 100 have been stolen from him over the years.

3.4.1 Functions of goats

As in the case of cattle, goats serve several functions. They are used for:

- **Meat:** Goats are reportedly slaughtered for consumption and not only for customary purposes.
- **Sales:** Goats are sold locally. A buck or castrate can fetch Rs 500, a doe normally about Rs 300. Because of the lower price and smaller size of goats, they are more frequently sold than are cattle.
- **Customary slaughter:** For a range of customary purposes, such as slaughter at a funeral, a goat is sufficient.
- **Traditional attire:** This refers mainly to leather skirts for married women. Goatskins are lighter than cattle hides and reportedly more comfortable to wear.

Goats are normally not milked. Only one man at Maria Trost said that he used goats' milk for tea.

3.4.2 Goat feeding

Goat management with respect to feeding differs according to area. At Msinga, goats are allowed to roam freely during the day in both the wet and the dry season, but spend the night in a kraal. At St Bernard's, people tether their goats during the wet season, enclose them in a kraal overnight and feed them in the morning with maize, so that they return to their home each evening in the dry season. Although goats basically have the same forage on offer as do cattle, their finer selection and greater preference for leaves and pods of trees means that they are less stressed nutritionally than cattle during the dry season.

3.4.3 Goat diseases and health care

Goats are – like cattle – hosts of ticks and can suffer from tick-borne diseases such as heartwater. Furthermore, farmers at St Bernard's said that some of them suffered substantial losses last year on account of goat disease. Indications are that young stock mortality is not particularly high, but adult mortality can be severe. This needs to be further investigated.

Goats are treated against disease whenever farmers see a chance to do so. We observed a kid with heartwater, which the farmer injected with antibiotics, but we did not have an opportunity to verify whether the treatment was successful. Controlling ticks on goats was not an issue during discussions with farmers. It is unlikely that they do this with the same rigour as in the case of cattle.

Goats suffer to some degree from predation. Jackals are blamed for taking some goats and eagles may take small kids but, with the extensive way of keeping goats that prevails in the study areas, such losses are hard to avoid. The extent of predation on goats could not be quantified.

3.4.4 Goat breeds and breeding

Breeds and types. The available literature does not allow any detailed characterisation of the different types of goats encountered. Most come close to what is called the "unimproved veld goat", which in itself is not a breed, but includes a range of different types. The types of goats seen during the study were not uniform types; even within herds there was heterogeneity of phenotypes. Nevertheless, they have a number of characteristics in common:

- fair degree of disease resistance
- early age at first kidding
- good fertility
- good mothering ability.

Farmers know Boer goats and some have heard about dairy goats, but the interest in alternative breeds is presently low. One of the reasons given by farmers is that outstanding animals may be prime targets for theft.

Selection of breeding animals. Male breeding animals are selected according to the mother's performance. Regular twinning, frequent kidding and good mothering ability are important criteria. Males not selected for breeding are castrated. As in the case of cattle, castration is often done with a Burdizzo castrator, which some community members own. At Msinga, the price for goat castration is Rs 20. Here, bucks are used for 1–2 years and are then castrated and fattened before slaughter. Castration is necessary to make the meat of bucks fit for human consumption, as bucks have a very strong odour. Old bucks are rare, but young males below one year of age can already cover does. There was a debate among farmers about the best age for castration. When castrated young, castrates can become fairly large; later castration leads to more compact animals.

Non-performing does are slaughtered. At Msinga, farmers said that they slaughter a doe after it has given birth 7–8 times. At St Bernard's, some farmers said that a female goat can live longer and still give birth and raise kids at a fairly advanced age, but a goat age of 17 years (farmer's statement) appears to be exaggerated. There may be a confusion between age and number of times a goat has given birth. However, 17 birth events would also be an extraordinary performance for a goat.

Reproductive performance. The goats at St Bernard's and Msinga have high reproduction rates. Goats may give birth at the age of one year, but normally at 15–18 months. Because the gestation period of goats is 150 days, they can give birth twice per year, although three pregnancies in two years is probably more realistic. The common pattern reported by farmers is that does give birth to a single kid the first time and twins fairly regularly thereafter, with the occasional set of triplets. Mortality was not studied in detail but, as mentioned above, farmers at St Bernard's claim that kid mortality is low, whereas adult mortality (or loss) is high – and not only because of the knife.

3.4.5 Use of goats

Goats are slaughtered for ceremonial purposes and for normal consumption. One farmer at Msinga claimed that he slaughtered 20 goats last year for consumption (he presently has a flock of 30 goats). At Msinga, it is noteworthy that people eat goats that die of sickness, disease and injury. For customary slaughter, e.g. for funerals, the colour and size of the goat is important and castrates are favoured.

Goats can be exchanged for cattle (Letty *et al* 2002) or for other goats. Cattle may be exchanged for goats if a person needs less money than would be gained by selling a beast. Letty *et al* (2002) refer to cases at Msinga where two head of cattle (probably small ones) were swapped for eight goats. Other terms of exchange can be two does (ewes) for one castrate or a doe for a buck or vice versa.

Goats are sold if a person or household needs small amounts of money. None of the farmers appears to sell goats regularly. Sales from commercial flocks present a bit of a mystery. We could not locate any goat auction, although breeding stock are reportedly sold and exported regularly. In a Google search in the Internet on Boer goats, most of the hits referred to goat breeders in the United States, Canada, Australia and New Zealand. There were few hits on South African websites, even

though Boer goats were developed in South Africa, and this country is still the main source of breeding material (often embryos or semen).

Farmers in all study areas mentioned the use of goats to pay *lobola*. There was an interesting difference between the opinion of men and women: men stated that goats can be used to pay *lobola*, whereas women insisted on cattle and sheep for this purpose.

3.5 Chickens

Chickens are the major livestock owned by women and are kept in practically all households. Flock size of adult or nearly adult birds varies between 20 and 30 birds. Management differs between study areas, but all chickens are free-ranging at least at times.

3.5.1 Functions of chickens

Like cattle and goats, chickens have various functions:

- **Meat and eggs:** Chickens are the most important meat consumed at home. Some households slaughter and eat chickens more than once a week.
- **Eggs** are not eaten by all household members, but youths and children seem to eat them fairly regularly – often not home-produced eggs but rather purchased.
- **Sales:** Chickens are sold to obtain small amounts of money, often on days when pension payments are made.
- **Customary purposes:** Chickens are used for sacrifice, such as when a child is sick. Chicken feathers are used for “traditional attire” (here, colour is important).

We also observed free-ranging chickens eating ticks and even picking them off cattle. Chickens eat insects and thus keep the insect pressure low around the homesteads.

3.5.2 General management of chickens

Chicken management is fairly extensive. On the farms in the Diocese areas, some enclosures are made, but chickens are allowed to roam freely for most of the day. In Msinga, chickens roost on trees during the night, whereas elsewhere they have access to wire enclosures.

The management of brooding hens is of key importance (a subject hardly covered by formal research). The general opinion of the farmers is that hens will lay 10–15 eggs and brood. Hatchability is reportedly good: only 1–2 eggs per clutch do not hatch. However, the size of the clutch diminishes quickly (for reasons explained in Section 3.5.4) and generally only 2–3 chicks reach consumable size and age. At St Bernard's and Maria Trost, however, farmers spoke of 4–5 birds per clutch reaching that size. According to the farmers, one hen can produce 4–5 clutches a year. One month after hatching, the hen is put into a dark room for a day or so, to stimulate the restarting of egg laying. This and other forms of “shock treatment” are widespread in traditional chicken husbandry. In Germany, it was common to dip a hen that was not laying eggs properly into water and put it into a bag for 24 hours. Similar treatment is

reportedly common practice in Swaziland.

At times, the farmers provide nests for brooding chickens. These range from chicken boxes to hearts of sisal agaves to pieces of large pipe.

On the Diocese farms, people collect the eggs that are laid outside the nest and eat them. If a large clutch has been laid in the nest, they may also take some eggs. Eggs are tested for freshness by submerging them in water. If they sink, they are fresh; if they rise, they are not. At Msinga, people buy eggs at the shop and leave all home-produced eggs to be brooded.

3.5.3 Chicken feeding

The free-ranging chickens can fend for themselves and scavenge around the homestead or in nearby bush areas. At Msinga, they are fed leftover *mealie-meal*; in other areas, they are fed crushed maize or even poultry mix. The amounts that farmers say they feed are fairly high: for 20 chickens, a 55-kg bag of chicken mix reportedly lasts for one month. This would amount to 90 g of feed given per bird per day. Recommendations for chickens in commercial enterprises range from 120 to 150 g of chicken mix per bird per day. Some further intensification may be justified, at least in the Diocese areas, since a more intensive way of raising chickens also means a better rate of feed conversion.

3.5.4 Reasons for chicken losses

Although a hen may produce several chicks that reach the size and age where they can be eaten, losses of hatched chicks reach levels of 80% or even higher. In the Diocese farms and in the more densely settled areas of Msinga, there are indications of disease and pests (probably Newcastle disease, chicken pox, fleas and others).

Heavy losses through predation by mongoose, jackals, genet cats, African wild cats, snakes and various birds of prey such as hawks and eagles are also reported. It is an open question whether chickens should be regarded as a low-input, low-output resource, or whether the farmers (women) are prepared to invest more in chickens in order to obtain a higher output.

3.5.5 Chicken breeding

Breeds and types. The chickens in the study areas are a mix of different types. This includes large, slender “gamey” chickens, intermediate types (relatively plump), small bantam birds, types with combs, types with combs or crests, fluffy feathers and even naked necks. Birds rarely breed true to type; this again emphasises the mixed nature of the birds. They also have a range of different colours.

There is a difference between study areas with respect to preference for bird types. At St Bernard’s, we were told that naked necks are liked because they attract lightening **why would anybody want to attract lightening**. At Msinga, chickens with naked necks are regarded as strange, and people reject them.

So-called commercial chickens are rarely kept. One farmer at Reichenau keeps some – for young people, who like this type of meat. He keeps broilers far longer

than the normal age of use (which is 5–6 weeks) in a fairly extensive way. He observed that hens of commercial chickens do not brood and that the cock – even though he is big and heavy – does not stand a chance against the normal cocks.

There are numerous Zulu names for different types of chickens. People at Msinga listed the following:

- *Molosi* tall chicken (Dict says iMolisi= Indian game fowl)
- *Masbasta* short chicken
- *Phucukwane* naked neck
- *Lamtutu* broiler (meaning “weak and soft”).

At St Bernard’s, farmers also listed a number of chicken types, but claimed that – apart from *Molosi* – they could not characterise them.

Selection of breeding stock. Cocks or roosters are selected from among the growing chicks. Unwanted cocks are slaughtered. Selection criteria mentioned were:

- large size
- well-developed spurs
- sympathy for a particular animal
- ability of mother to rear chicks.

In the case of hens, no selection is done, but hens that are not good at rearing chicks are slaughtered. Hens are preferred for meat (they are softer), but young cocks are also acceptable. Castration or caponisation of cocks is not practised, and old cocks are reportedly tough to eat. Cocks are used until the spurs bend (on the Diocese farms) or for one or maximum two years (at Msinga). Occasionally, cocks are exchanged between homesteads.

3.5.6 Use and marketing of chickens

Apart from being the most regularly consumed meat in smallholder households, chickens are also used for sacrifice. If a child is sick, a red or a black chicken may be slaughtered. White chickens are used for “talking to the ancestors”.

Services within the community are often paid in the form of chickens. At Msinga, a man who makes and inserts an axe handle is given a chicken; other services are reportedly also paid in this way.

Chickens are an important source of income, particularly for women. They are often sold often on pension days, when pensioners have money. Prices quoted were Rs 20 for a small hen, Rs 30 for a bigger hen and Rs 30–50 for a cock. These prices are higher than those for frozen chickens in the supermarkets. A number of reasons were given for preferring live rural chickens, such as:

- better taste, although according to older men, youths tend to prefer the softer commercial chickens;
- availability of head, feet and innards, which are also eaten;
- storage “on foot”. Where there is no electricity, refrigerators cannot normally be

used. It is therefore easier to store food alive, rather than dead and frozen;

- cultural importance. Frozen broilers cannot be used to chase evil spirits away or to talk to the ancestors.

Reportedly, men often sell chickens, but men at Maria Trost maintained that the money goes to the women. Some men claimed that they would give all their money, including pension money to their wives, as women manage money better than men can. Whether all men give all their money to their wives is doubtful.

Box 2: Indigenous chickens – a neglected resource

Chickens are – worldwide - the species of domestic animal which is fastest growing in numbers, but the official statistics reflect almost exclusively the growth in numbers of commercial chickens. [Commercial chickens are the domestic animal species for which the environment is best adapted and to the physiological needs of animals ?](#), and as the environment can be controlled and standardized (in chicken batteries), animals are also pretty standard breeds. Chicken breeding at this level is highly commercialized, with few chicken breeding firms dominating the market. At present commercial chicken represent the cheapest meat and the price of eggs has dropped in recent decades.

However the success and failure of the chicken industry depends strongly on the availability of external inputs, [quality of food is not much of a concern in intensive](#) systems infrastructure (electricity for refrigerators, shops etc) are major factors which determine the success. Commercial chickens are also an enterprise, where “economy of scale works almost perfectly. Large scale chicken enterprises can also have a substantial negative environmental impact. [Despite lawn and green between chicken houses](#). Durban and its environs seems to be a centre of commercial chicken production.

In contrast to commercial chicken-keeping the traditional chicken has received very little scientific attention and is not taught at universities or colleges, and apparently there is no text book available which could encourage extension officers in this field. The husbandry of brooding hens is not well documented and students of agriculture and extension personnel may be well versed in cattle, sheep and goats, but often do not know the basics of chicken keeping. A recently released data base on Domestic Animal Genetic Resources (DAGRIS) on Africa fails to list any chickens. The ARC efforts in Irene to describe and conserve the genetic base of indigenous chickens – however incomplete – is therefore very commendable. It is likely that many African villages have a greater genetic diversity in their village flock than the whole of the chicken industry combined.

The benefits which can be derived from traditional chicken-keeping for poverty alleviation, for HIV affected households and for women, are in sharp contrast to the widespread neglect of chickens in science, teaching and extension work.

Our own work suggests that a hen can raise up to 4 clutches a year, but that losses during chicken raising are high. Chicks lost due to disease and predation are in the order of 80% or more. If losses could be halved this would represent a tripling of present production. According experience in Limpopo Province, [more chickens need to be fed more feed](#), but growing numbers can always be solved “with the knife”, giving more meat to the families.

3.6 Dogs

Dogs are the fourth most important species kept by a majority of households. They are kept for:

- guarding the homestead
- hunting
- driving goats and guarding chickens (at Msinga).

Although some farmers keep guard dogs which they have acquired from commercial farms (Rottweiler mix, bull terrier mix), common guard dogs might be characterised as **pariah?** dogs, i.e. dogs of uncertain ancestry, mixed, well adapted to the environment, and generally of low status and low value. Puppies of such dogs may be given away or sold for a low price (Rs 10–20). These are also the type of dogs used at Msinga for guarding chickens and driving goats.

Hunting dogs are quite a different matter. They are greyhound-like creatures and keen hunters and are sold at fairly high prices. The prices quoted ranged from Rs 300–500 for a puppy (the price of a goat) and up to Rs 3000 for an adult, trained hunting dog (the price of a cow or an ox). Dogs are the only livestock that are sold at a certain age and not just when money is needed.

The hunting dogs probably go back to the original dogs introduced into southern Africa several thousand years ago. Apart from being intelligent, trainable and agile, they have the advantage of being adapted to a low-protein diet, which means that they do not need to be fed meat. These dogs have recently attracted attention from scientists (e.g. Hall 2000). The original breeds are under threat because of crossbreeding with European greyhounds from the cities. The original breed of hunting dog in South Africa definitely deserves greater attention.

The main veterinary treatment for dogs is vaccination against rabies. This is free of charge and reportedly carried out regularly on the Diocese farms, but not at Msinga anymore. Officially, dogs need to be licensed in South Africa, an issue which is a source of dispute between farmers and the authorities.

Hunting has become a leisure-time activity, especially of taxi drivers (part of the new economic elite in communal areas). It is often illegal, as it involves killing of protected species and also betting. The buck is either killed by dogs or clubbed or shot by hunters. Farmers claim that hunting does not threaten wild animal populations in the rural areas, but this is open to debate. It is not suggested that the projects get heavily involved in dog breeding, but there may be a chance to link up local breeders of hunting dogs with other interested parties within South Africa, such as dog breeders who want to conserve the old hunting dog (Hall 2000).

3.7 Other livestock species

There are a number of other livestock species that are kept by some households in the study areas. These include donkeys, horses, pigs, sheep, geese, Muscovy ducks, turkeys, pigeons and cats.

Donkeys. Donkeys are used for ploughing and for transporting goods, but their keep and care is not highly developed and they have a low cultural value. Potentially, donkeys could play an important role, particularly for resource-poor households. Donkeys need much less forage than do cattle. They are long-lived. In dry areas, they are rarely affected by disease. For their weight, they are relatively strong. Halters, harnesses and other appropriate equipment would be of advantage, instead of the wires and thin nylon ropes we saw being used. Appropriate saddles would also help donkeys to carry people more safely (Jones 1997). When donkeys are used for ploughing, they must normally pull fairly heavy ox-ploughs. One farmer interviewed at Msinga uses eight donkeys in a team at any one time.

The reason for the cultural rejection of donkeys is not clear. The DoA may have played an important part in this respect. Government campaigns against donkeys were so strong that, in the 1980s, donkeys were even shot by DoA staff. The myth that has developed about donkeys includes beliefs such as “no plant will grow where a donkey urinates”. In some other parts of the world, donkey manure – like horse manure – serves as a valuable fertiliser. The South African grasses are surely not so weak that they cannot sustain some extra nitrogen.

However, it is a fact that the farmers whom we met did not want to discuss donkeys openly. At Maria Trost, it was the people living “outside the Diocese farm” who kept donkeys. At St Bernard’s, it was the people “behind the hill”. When the possibility was raised that donkeys could be useful for transporting firewood and water, both women and men argued that they would rather wait for electricity and piped water. At Msinga, a farmer who keeps 15 donkeys said that he does not have any use for them, because it is too dry to plough, and that his donkeys don’t have names. However, donkeys in the Msinga area are also sold to Basothos who walk 300 km from Lesotho to buy donkeys cheaply in a place where they have very little value. The Basotho use them for draught and transport, and rumour has it that they also eat the donkeys.

In any case, as long as there is such a strong cultural rejection of donkeys, there is no use in trying to promote them. The attitude towards donkeys is changing in other provinces of South Africa. The Provincial Government in Limpopo has started a donkey promotion scheme. On the Diocese farms, donkeys were regarded as animals that would be cared for by women; at Msinga, donkeys were animals for men.

Horses. The sole purpose of keeping horses is for riding. This was mentioned only by people at Reichenau. They are animals for men, but do not seem to be of great importance. They were not discussed in detail with farmers.

Pigs. Pigs were seen at Reichenau and discussed at Maria Trost. The pigs we saw were all of the large white, commercial breed, and kept for sale. Either pig feed is bought or maize produced on the farm is fed. Farmers in the Diocese area eat pork (in other parts of South Africa where Church of Zion has great influence, pork is not eaten) and reportedly also buy it from butchers if towns are nearby. Pork production can offer new income-generating possibilities but, for commercial markets, communal farmers would have to compete with large-scale farmers. Pigs are regarded as “male and female” animals, as the owners are normally men but women look after the animals.

Sheep. Sheep are kept for meat, skins, wool and customary slaughter, and are regarded as animals for men. Sheep were seen on farms at Reichenau, as well as at Msinga. At Reichenau, on the farm of a widow who had lost her son last year, we discussed sheep-keeping in some detail. The lady's nephew helps her with her livestock, since – as a woman – she is not allowed to enter the kraal. The sheep were Dohne Merino, a breed for wool production, but it is difficult to sell the wool. The woman stated that she first had to carry out the customary slaughter of an animal, about one year after the death of her son, before she could think of selling her sheep.

At Msinga, the black Zulu sheep is still being kept. This breed is becoming rare and the breed conservation group at the Animal Improvement Centre at Irene has difficulties finding a replacement for their ram. According to Msinga farmers, bush encroachment forced them to switch from sheep to goats. It was interesting to note that women preferred *lobola* to be paid in sheep rather than goats. There are also some traditional sheep being kept at St. Bernhard but we did not see these sheep during the study, so the breed could not be determined.

Other poultry includes geese, ducks, turkeys and pigeons. Pigeons appear to be kept more as a hobby than for production purposes. Geese are kept for meat and as “watchdogs”, but by few people on the Diocese farms. They explained that they had just started and therefore had very little experience in goose husbandry. Two farmers we visited kept Muscovy ducks. A widow at Reichenau kept a few and reportedly eats them, but her small flock could certainly not contribute as many birds to family nutrition as can chickens in other households. At Msinga, the children of a widow had bought two ducks, but still have to buy a drake. One farmer keeps turkeys and can reportedly sell birds at Rs 150 each.

Cats. Domestic cats are not kept in all households, but are regarded as useful for eating mice and for “biting snakes”. They are not traded.

Some people at Reichenau expressed an interest in bee-keeping. In the study areas, bee-keeping is rare and the little bee-keeping we saw was restricted to only one hive per bee-keeper.

4. A note on pasture management

During the study, which was carried out in the late dry season, there was little time or opportunity to observe pasture conditions in detail. The potential of pasture production was difficult to assess, because the vegetation was dry or had been burnt in the lower-lying areas and the grasses were therefore not easily identified. In most parts of Msinga, there is insufficient vegetative cover to carry a fire. In any case, the preceding year was exceptionally dry, resulting in even less vegetation than in a normal year.

It was interesting to note that obvious erosion scars – a clear sign of degradation – were much more obvious on commercial farms than on the communal land in the Diocese area.

There are considerable conceptual difficulties in discussing pasture management in South Africa. The official approach is still that scientists and the DoA determine the carrying capacity of pastures and, if the stocking rate exceeds the estimated carrying capacity, the DoA may even expropriate land. However, research during the last 20 years has shown that the scientific foundation for estimates of carrying capacity is weak. Some of the flaws in this concept are:

- If estimates of carrying capacity are based on animal performance, they do not take into account the multiple functions of livestock, because the benchmarks are beef-producing enterprises.
- Measurements of pasture yields do not measure primary plant production but rather standing vegetation biomass. The amount of plant biomass taken off by animals is difficult to guess. Moreover, plant biomass on pasture is difficult to measure to any degree of accuracy because of large variability at the small scale.
- The botanical composition of pasture is influenced not only by rainfall and grazing pressure, but also by other factors such as burning, nutrient import and presence of invasive weeds (*Lantana camara*, for example, is spreading in the Diocese). The use of fire, in particular, remains a difficult question. Trials at the University of Natal in Pietermaritzburg show that the most highly regarded grass, *Themeda triandra*, will disappear if the pasture is not burnt, but it will also disappear if it is burnt and then intensively used. Once *T. triandra* has gone, it is very difficult to re-establish, particularly if wire grasses such as *Aristida spp* or *Sporobulus spp* have taken over. Furthermore, the opinion that *T. triandra* is the “climax” vegetation in the wetter parts of KZN was challenged during the recent International Rangeland Congress in Durban.

There is a strange contradiction between the rangeland scientists and the official range management administration. Whereas many South African rangeland scientists are world leaders in their discipline and very innovative, the rangeland administrators often stick to old paradigms that have been proven wrong or are at least doubtful.

Particularly in the wetter areas, grazing can contribute to rangeland degradation. However, for good pasture management, fairly strong local institutions have to be in place to enforce restrictions on animal numbers and on periods of pasture use. Although the positive effects of rotational grazing have often been overestimated,

resting of pastures can help at times.

Although the land redistribution process has been going on for a long time in the project areas, it is not yet concluded. The pasture is still not truly a communally-managed resource, but has rather strong elements of open access. This means that it is difficult to enforce grazing rules, such as limiting animal numbers and excluding certain parts of the pasture from grazing at particular times. As long as land rights are not clearly regulated, neither fencing nor pasture improvement will make any sense.

At St Bernard's, there was a long discussion with farmers about fencing. The Diocese RDP had already financed a fence, but it has since disappeared. The farmers are now requesting another one, and the project is refusing to fund it. Before the project makes a new commitment, new terms need to be negotiated, involving a substantial contribution to the fence paid by the farmers who will benefit. As mentioned above, pasture management requires strong and effective community institutions. It is doubtful whether the present community institutions in the project areas are committed enough to embark on pasture management, such as controlling stocking rate and time spent on pasture.

On one land reform farm in the Weenen magisterial area, the DoA alleges such a high level of overstocking that, according to law, the farmers presently using the area should be expropriated. It appears that the farm is grazed not only by cattle belonging to the farmers in the group that owns the farm, but also by animals belonging to relatives and friends of these farmers. Discussion with these farmers needs to be taken up, and ways of restricting the use of the pasture to animals from the farm itself should be explored.

5. Recommendations

The study shows that the reasons for keeping livestock in the communal areas are much more complex than simply to produce milk or meat. Livestock keeping also has a very important cultural dimension. Smallholder farms function not like a scaled-down version of a commercial farm but have, rather, their own rules and rationality, such as multifunctionality of livestock, giving priority to subsistence and not marketing, practising farming as only one part of a diversified livelihood strategy, etc.

A first step in planning interventions and support measures is to accept the value system of the farmers as valid and to build on that, rather than trying to fight it, as the DoA still sometimes does. Interventions in the study areas must, however, be closely coordinated with the DoA, as a project has a limited lifespan and continued support will have to be provided by the DoA – possibly with the help of NGOs.

Given the great differences between study areas and between farms within each study area, a “basket of options” approach should be taken. This implies that the projects should offer a range of interventions to farmers, which they can take or leave. Whereas certain innovations such as using manure or making enclosures for chickens can be taken up by individual farmers, other innovations need more organisation and cooperation between farmers.

It is not necessary that the projects provide all technical services. Linking with existing initiatives of the government, of other projects or even of international programmes should be the aim, with a project taking on the roles of information broker and bridge between different partners.

During the meeting of the Mdukatshani Advisory Committee plus others, various options for project interventions related to livestock husbandry were presented and discussed. These include:

- training community-based animal health workers (CAHWs)
- forming chicken-vaccination groups
- increasing chicken survival by reducing losses to predators
- promoting low-external-input livestock breeds
- growing forage and dual-purpose crops for dryland conditions
- storage of fodder, harvested or bought.
- applying animal manure to vegetable gardens and cropland
- improving mineral nutrition of livestock.

5.1 Training community-based animal health workers (CAHWs)

Although farmers in the area have access to antibiotics, vaccines, dips (acaricides) and other “modern” drugs, they do not have easy access to veterinary services. Medicine is often not adequately stored, dosage is followed only approximately, expiry dates are not taken into account and therefore treatments are less effective than they should be. The idea of CAHWs is to train some people in the community who then can store medicines well, give treatment or advice on treatment, and contact a qualified veterinarian if required. Training should be supported by the DoVS, which has offices in towns (but deal thus far only with classified diseases) and by private veterinarians, who also carry out curative treatment. Local representatives

of the DoVS who were contacted about this find the idea attractive. The training of CAHWs could be a pilot for the Province.

A DFID-funded programme – Community-based Animal health and Participatory Epidemiology (CAPE) at the Inter-African Bureau of Animal Resources (IBAR), an institute of the African Union – provides support for CAHWs in the Horn of Africa. Training videos and a number of local and regional reviews can be obtained from CAPE-IBAR (www.cape-ibar.org). These sources should be consulted before planning and implementing the pilot training in South Africa.

The experience with CAHWs in other countries of Africa is somewhat mixed. Often, CAHWs are trained and given an initial kit of medicine and are then supposed to recover funds to buy new medicine, but problems have arisen in maintaining supply. Some projects supported CAHWs by employing and paying them or reimbursing expense claims. These attempts did not prove to be sustainable after the end of the project. The situation in KZN is different, because farmers are already using modern veterinary medicines and most drugs are available at pharmacies in country towns. Moreover, there are already community-based animal service providers in the form of animal castrators, who should be integrated into any CAHW programme in the area.

Technical problems that would need to be addressed in a CAHW programme are:

- diagnosis of the most important diseases
- safe and proper storage of medicine and vaccines
- correct dosage.

The commitment of veterinary services and communities will need to be negotiated and, to avoid unnecessary conflicts, the payment for the work of the CAHWs will need to be agreed upon within each community. During the meeting with the Mdukatshani Advisory Committee, a mode of payment based on success was suggested. Whether this is realistic needs to be investigated. The CAHWs will probably concentrate on animals managed by men, unless particular efforts are made to train women and to sensitize both men and women to the needs of women who manage livestock.

5.2 Forming chicken-vaccination groups

Although disease diagnosis was not carried out during the study, the information provided by farmers and veterinarians suggests that, at least in the more densely populated areas, Newcastle disease and chicken pox are causes of chicken mortality. Vaccination is possible against these major diseases. Vaccines are available, but only in commercial quantities (one bottle for 1000 doses of vaccine). As a smallholder household rarely has more than 50 chickens, less vaccine would be wasted if households would form chicken-vaccination groups. In a GTZ project (BASED) in Limpopo Province, such groups are showing at least initial success. The main intervention there was facilitation of the formation of chicken-keeper groups and of their access to vaccines: farmers collected money to buy vaccines; pharmacists were asked to keep vaccines in stock; in some cases, the Field Assistant bought the vaccine and brought it to the village. As the vaccination is fairly easy and with low risk, the success can be quite spectacular. Vaccination against poultry diseases can be an entry point into improving women's animal keeping. Contacts with BASED

should be established and the possibility of a cross-visit explored as a first step.

Contact: via Paulo Ficarelli, GTZ (BASE.gtz@pixie.co.za) or BASED–GTZ (German Development Cooperation), Limpopo Province Department of Agriculture (LPDA), PO Box 4645, 0700 Polokwane/Pietersburg, South Africa, Tel +27-15-2957090 ext. 244/228, Fax +27-15-2913660.

5.3 Reducing losses of chickens to predators

Protecting chickens against predation would involve construction of cages/enclosures for brooding hens and their chicks. As losses of chicks are particularly heavy during the first 3–4 weeks of life, it is expected that the survival rate would increase but, in addition to providing an enclosure, this form of protection requires that additional feed be given, as the birds can no longer scavenge for themselves. Poultry feed is being purchased by some farmers and, in the area of the Diocese RDP, substantial amounts of feed are already being given to chickens. Some farmers at St Bernard's have started to construct chicken enclosures. The ARC has developed a movable chicken pen, which is too expensive to be attractive to smallholder farmers but could provide some ideas for home-grown adaptations. Older textbooks would need to be consulted with respect to the management of brooding hens. In the BASED project area, chicken enclosures are already widespread. A cross-visit would be useful for giving farmers some ideas.

5.4 Promoting low-external-inputs livestock breeds

This refers mainly to cattle. Local farmers have tried to cross their cattle with stock from commercial farms and with Brahmans. The emphasis should be on maintaining the indigenous Nguni breed. "Grade" Nguni are now available from commercial stud farms. These stud animals are selected for their adaptation to the environment and not for high growth rates. Crossbreeding with, for example, Hereford cattle produces animals that are more susceptible to ticks, helminths and disease than are the Nguni.

Animal breeders are generally fond of bulls, and Zulu cattle breeders are no exception. If bulls are not selected from within the herd, then Nguni bulls are the best choice to maintain animals that are early-maturing, can cope with low-quality forage, calve regularly etc. Several possibilities to maintain Nguni characteristics were discussed with farmers:

- **One or more farmers obtains or buys Nguni bulls.** With the low bull density in most areas, the bulls would probably serve most of the cows. The disadvantage is that quite a few bulls are needed to cover an area. The recommended ratio of bulls to reproductive females is 1:25. An Nguni bull from a stud farm costs Rs 6000–7000. Arguments against introducing bulls into the communal areas were: risk of cattle theft (a commercial farmer on the Advisory Committee had just lost a valuable bull that he had recently bought) and the difficulties of a small Nguni bull competing with resident bulls.
- **Bring reproductive female shortly after calving to a bull.** The "cow-on-holiday" approach would require access to a farm where the animals can be kept in a sort of quarantine and from which the farmer would get back his cow or heifer in calf, sired by a "superior bull" (meaning Nguni adapted to the environment). It would be necessary to reach agreement with the farmers taking part in the scheme that bull

calves would not be castrated.

- **Artificial insemination (AI).** South Africa has a good infrastructure for AI and trained inseminators. Nguni semen is available or can be made available. One Nguni stud farmer we visited uses AI on his heifers. The advantage would be that no expensive bull is needed and the risk of stock theft would be minimised. Here, too, it would be necessary to reach agreement with farmers taking part in the scheme that male calves are not castrated up to an age of, say, 3–4 years. The young bulls could inseminate at least some cows and heifers. The drawback of such an approach is that cows and heifers would have to be identified and inseminated before a native bull covers them. A variation on this approach would be to synchronise reproductive females, or at least those that have calved less than 3–4 months ago. The disadvantage of such an approach would be that animals that have already conceived would abort, but synchronisation would have the advantage that an experienced inseminator could carry out the insemination, and most of the animals would become pregnant with the improved semen.
- **Acquisition of pregnant heifers by the farmers themselves.** The heifers would probably integrate into the herds more easily than bulls, and might not offer such an attraction for cattle theft, but stud heifers are about twice as expensive as local heifers.

All these options have their advantages and drawbacks. At Maria Trost, St Bernard's and Reichenau, Nguni breeding schemes would enhance adaptation of animals to the environment. At Msinga, they would prevent breeding of animals less adapted to the environment than are the Nguni cattle.

The best first step is probably to make well-prepared visits to Nguni stud breeders. Local farmers may then appreciate the advantages of Nguni cattle more than they do at present (and may buy some breeding stock on their own initiative). One such visit was undertaken in the course of the study when the RDP team, the consultant and one communal farmer visited a commercial Nguni stud farm. After such visits, the different options should be discussed with farmers and then a decision made about the path to pursue.

The consultant, Mdukatshani staff and part of the RDP team also visited the Stock Owners' Association near Pietermaritzburg. Both the Association and the Nguni stud breeder appear to be eager to cooperate further with the projects if a breeding scheme materialises.

The Stock Owners' Association is presently involved in a project supported by Heifer Project International (HPI), in which Nguni x Jersey crosses are produced as potential communal dairy animals. Although this approach is far better than the DoA's offering AI with Holstein-Friesian semen to communal farmers, the HPI-supported project may not produce animals that really fit the needs of communal farmers. Milk marketing may be more difficult than anticipated, and the feed requirements and veterinary inputs needed may be higher than many smallholder farmers can afford.

The case of promoting low-external-input breeds of sheep is somewhat more difficult. There is an old Zulu sheep breed that is declining in numbers. This breed may have, in fact, many positive characteristics, such as resistance to helminths and various diseases, capability to cope with low-quality feed, etc, for which the Masai sheep in

Kenya were recently so praised by the International Livestock Research Institute. One reason for the decline in sheep numbers at Msinga is obviously the bush encroachment. In the Reichenau area in particular, farmers keep wool sheep. However the wool is no longer bought by the traders as the market price has become too low. In view of this situation, less woolly sheep such as the Zulu sheep could be promoted as an alternative to breeds kept primarily for wool production. Sheep of the Zulu breed should be regarded as part of the cultural heritage. The Diocese projects could help promote the Zulu sheep by:

- establishing closer contacts with the Farm Animal Conservation Trust and the group at the Animal Improvement Centre at Irene that is trying to characterise and conserve indigenous animal breeds
- disseminating publications of the Farm Animal Conservation Trust, such as the book "landrace breeds" and encouraging translation of this book into Zulu, which could indeed increase farmers' interest in such landraces. We did show the landrace book to some communal farmers and they showed a very keen interest in such written material.

Any more active support for maintaining such breeds, like a subsidy for keeping them, is beyond the scope of the project and would have to be left to the State.

Best contacts with respect to animal genetic resources are: Farm Animal Conservation Trust, Private Bag X2, Irene 0062, Tel 012-6729030, Email Jenny Bester (jbester@idpi1.agric.za or jbester@iapi.agric.za); and National Department of Agriculture, Sub-Directorate Animal Genetic Resources, Private Bag X138, Pretoria 0001, Tel 012-3197448, Email Keith Ramsay (Keithr@nda.agric.za).

5.5 Growing forage and dual-purpose crops

The interviews and forage calendars made by the farmers suggest that, in winter, there is a forage gap which, at least in dry years, can be so severe that animal survival is endangered. The smallholder farmers presently have few means to counteract this shortage. Long-distance seasonal migration is no longer possible. Farmers feed stalks of maize and sorghum, but – with the exception of Reichenau, where some farmers grow *Eragrostis* for hay – no sign of forage cultivation could be found. Another handicap is that neither the commercial seed sector nor Cedara Research Station has invested much into developing forage crops suited for smallholder farming. Links between smallholder and commercial farmers for forage supply are also not strong. For example, a commercial farmer near Msinga cultivates wheat, but burns the straw. If it were baled, it could be sold to communal farmers as a forage reserve for the winter.

Crops recommended to farmers should either be available commercially or in an advanced stage of evaluation by the local research station. However because the South African research system has conducted very little research on forage for smallholder farming systems and on dual-purpose crops, it may be necessary to look further afield. Project staff, together with staff from the DoA, could contact international programmes like the Sorghum and Millet Programme of ICRISAT (International Centre for Research in the Semi-Arid Tropics), which has an office in South Africa.

For the wetter Diocese farms, fodder radishes (which are found on Cedara Research Station) offer some promise. They are high-yielding root crops that provide a wet fodder that can be stored “on the foot” in the fields. Cedara Research Station holds some lines that seem to out yield the presently available commercial lines. Such lines should be tested on farmers’ fields.

As for other crops that could be promising under smallholder conditions, the situation in South Africa currently does not look very good. A crop like berseem (*Trifolium alexandrinum*) is widely grown from Morocco to India as a winter crop under irrigation. Some varieties can tolerate frost down to -5°C, and would probably fit well into a maize–berseem–maize rotation. It does not seem to be known to the agronomists or extensionists in South Africa with whom we spoke. Berseem could improve soils (it can fix nitrogen) and provide a high-quality winter fodder. It could be sown after the maize harvest, used for cut-and-carry feeding for 4–5 months, then ploughed under and the new maize crop could be established. Commercial farms plant Lucerne, which – once established – can last 4–5 years or longer and is a highly productive forage crop, but it does not fit into short-term crop rotations. Because of its non-availability, berseem remains only a theoretical option and other fodder crops, such as rye, green barley or wheat as green fodder, may have to be tried, if farmers think that a winter fodder crop could improve their cattle production.

Lentils may also have potential as a dual-purpose winter crop, yet it is neither cultivated nor suggested as a crop by Cedara. Experiences in Syria suggest that lentils as a dual purpose crop are better suited as a legume than annual *Medicago* spp, which are used in the sheep/wheat zone in southern Australia. Lentil hay is a valuable forage. Lentils are also grown in northern Sudan, here even under irrigation and lentil hay is sold in bags to pastoralists, sometimes at considerable distances from where it is grown.

Cowpea is a summer crop. The so-called indeterminate varieties of cowpea have a better forage value than varieties that are selected for seed yield, yet the varieties available in South Africa are restricted to seed varieties.

Similarly, we had great difficulties finding anything about pearl millet. This is widely grown as a crop for both food and feed in West Africa, India and Namibia and is much more drought resistant than either maize or sorghum, but we could locate only a forage variety that is not well-suited as a dual-purpose crop – which the grain varieties of pearl millet are. It may have some potential in the Msinga area, where people complained about crop failure because of drought. According to an old agricultural report, it was grown in the area in the 19th century. An excellent beer can be made from millet (beer is the main reason for cultivating sorghum at Msinga) and thus millet could complement sorghum. In other parts of Africa, millet stalks were found to be of better forage quality than stalks of sorghum or maize, but no research work has been done in KZN on this drought-resistant dual-purpose cereal. There are certainly other crops that have not yet been tried in the area but which may fit better into smallholder systems than existing crops.

In the case of all the “exotic” (currently not being grown locally) crops suggested, it cannot be assumed that these will grow well in KZN. The minimum that the project could do would be to try to find out why these crops are presently not being researched. It could be that older trials (since forgotten) have shown that these crops

do not grow well, and this would be a very valuable piece of information. If, however, the reason for not growing them is that “they have never been tried”, or “they don’t fit into large-scale farming”, it is strongly recommended that DoA staff should be encouraged to investigate such “exotic” crops and see if, and how they can fit into smallholder farming systems. This does not mean carrying out full-scale (and lengthy) variety trials on station but rather – after the phyto-sanitary regulations have been passed and initial trials have shown that the plants will, in fact, grow – to start trials as soon as possible in collaboration with farmers in their fields. With a bit of imagination and dreaming, farmer research groups in communal areas could become a good institutional framework for such experimentation.

Contacts (taken from www.icrisat.org):

Agronomy: Mr AJ Pretorius, ARC Grain Crops Institute, Private Bag X 1251, Potchefstroom 2520, Tel 018-299-6100.

Food Science: Dr John RN Taylor, Dept of Food Science, University of Pretoria, Tel 012-420-3280/3210, Email jrnt@scientia.up.ac.za.

The website also indicates other contacts in neighbouring countries, which may be able to provide seed samples for farmer-led trials. The contacts in Zimbabwe and – possibly – Namibia appear to be the most promising as far as seeds for pearl millet (*Pennisetum typhoides*) is concerned. During a discussion with ICRISAT scientists at the recent Tropentag in Göttingen, the scientists welcomed contacts between projects and the international research organisation. If seed samples are provided by ICRISAT a standard contract has to be signed, which apparently states that larger scale, commercial utilisation for seed production is subject to certain restrictions.

5.6 Storing of forage or buying in drought feed

This might particularly apply to Msinga. Hay could be harvested to feed/supplement animals in late winter, particularly if the next rains start late. Hay could be harvested in mid-winter, e.g. in low-lying areas. This is done increasingly in the Sahel of West Africa. The quality would be fairly low – it would be survival feed. The quantities needed for a herd of – say – 20 head of cattle (and a few goats) – even if fed selectively – would be substantial. If it is assumed that a cow/ox/bull gets 3-4 kg a day for 6 weeks, 3 t of hay would be needed for a herd of 20 head. The “risk” of harvesting hay this way is that if rains come early the hay would not be needed. It would also involve privatising a previously communal resource.

Another approach would be, to buy straw from commercial wheat farmers. Apparently a wheat farmer not far from Msinga presently burns the straw of his two wheat crops a year. The baled straw could be sold to communal farmers in need. Wheat straw is also a survival feed, but is used intensively in northern Africa, the Middle East and India as livestock feed. It is a “hot” feed, i.e. animals produce a lot of heat when eating it. The suitability of such an approach would also depend on when farmers buy the straw and where it is stored. The commercial farmer(s) would also have to agree to bale in 20 kg or so square bales, as the larger round bales, used on commercial farms cannot be handled as easily as the smaller ones. Round baled maize stalks were seen on commercial farms during the visits in the Diocese area, and straw is stored in many areas in fields, on trees, on special feeding places or close to the homestead (e.g. Bayer & Waters-Bayer 1998).

The concept of survival feeding in the droughts may take some time to be adopted by Governmental officials. This system is a great opportunity for communal farmers.

[Took a lot out of here to try make it clearer --check it.](#) The concept should be suggested to farmers, and may require some change in animal management, as farmers will want to feed their own herd, and maybe selected animals only. During droughts, small calves and cows in milk are the most susceptible animals.

5.7 Applying manure to vegetable gardens and cropland

The use of manure would appear to be new to the areas, but it has a long tradition, particularly at Msinga. The projects are trying to revive this practice and perhaps modify it to a degree. At Msinga, trials with manure will start this year. The Diocese RDP has worked on manure application at Maria Trost and St Bernard's for five years and at Reichenau since 2001. In the Sustainable Agriculture Programme, great emphasis is put on compost. [Compost fits well into small-scale cultivation of high-value crops, such as vegetables, and – as long as vegetable plots are small – the availability of neither compost nor manure would limit application rates?](#) For larger fields of maize or sorghum, the amount of compost needed may be beyond a farmer's capability to prepare and transport. Furthermore, the amount of manure collected in the kraal will be in the order of 500 kg dry matter per head of cattle per year; thus, recommended application rates need to take into account the availability of manure (for details, see Bayer & Pietrowicz 1986).

5.8 Improving mineral nutrition of livestock

With the exception of a few richer farmers at Reichenau, farmers do not generally give minerals or even salt blocks to their animals. Salt increases the appetite, whereas phosphorus licks and other minerals can help improve animal health and fertility. This is particularly evident at St Bernard's and on the South Coast. As a first step, the subject matter specialists of the DoA and the University should be consulted and a tailor-made mix should be worked out and recommended to farmers. This may help to overcome the problem of cow fertility in the project areas. Mineral nutrition of livestock is complex, as minerals have strong interactions. Mineral analyses of forage, hair or blood samples give only a rough guide to the animals' needs. If no clear answer can be obtained from the experts, some exploratory analyses might be necessary. In any case, the projects should advise farmers to give salt to their animals.

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Appendix 1: Questions about animal husbandry

First we asked why people keep livestock, and then we asked them to score the reasons according to relative importance, by distributing five beans per person on the brown paper where we had drawn a matrix of animal species and purpose or function. Since men and women may have different aims and perceptions of livestock, women were given red beans and men white beans. Then the scores given by men and women could be differentiated.

Different purposes may require animals of a different sex and allow different feeding levels. As an example: a dairy animal needs to be fed well if you want milk. If you want manure or you keep animals as a savings account, it may be sufficient that the animal remains alive, and then does not need so much feed or can make do with feed of lower quality.

Herd structure also depends on the purpose or function of the animals. If you keep animals for draught (draught, not drought!), male animals or castrates are most suitable. If a farmer claims that s/he keeps animals primarily for dairying, yet has 50% males in the herd, this would be strange. If a farmer keeps animals for draught, milk and meat, then 50% males, including castrates, can be very rational.

Productivity studies tend to concentrate on growth, milk yield and reproduction, and do not take the other functions of livestock into account. The aspects of the normal productivity studies that are valuable for all approaches to measuring productivity are reproduction and mortality rates. As a first step, calving/lambing/kidding intervals and length of reproductive life should be quantified.

When discussing livestock productivity levels with farmers, some biological knowledge is advantageous. Cows have a pregnancy or gestation period of nine months, sheep and goats five months, chickens sit on their eggs for 21 days before the chicks hatch, and donkeys have a gestation period of 10–14 months. Cows may live up to 20 years, so if a farmer tells you that this cow is 35 years old, ask again. Likewise, if a farmer tells you that a goat is 20 years old, probe a bit deeper. Maybe the goat gave birth 20 times (which would be unusual but not impossible) and is perhaps 11 years old.

To obtain a general idea about animal productivity, ask:

- what was the age at first calving/lambing?
- how long are the intervals between births?
- how often does a cow/ewe/doe give birth in its life?
- how many of the offspring reach the age of a really good cow/ewe/doe?

Of course, these questions have to be asked in a locally adapted way. At Msinga, it turned out that there are two distinct calving/kidding periods. This means that a doe (ewe) that misses a period can have a kidding interval of one year instead of six months, and a cow that misses a period may have a calving interval of 1.5 years.

To gain somewhat more precise information, the “interviewing cow” approach (Armbruster and Bayer 1992) can be used. Here, the questions are asked in this order:

- How old is the animal?
- When did it last give birth?
- What happened to the offspring?
- When did it give birth before that?
- What happened to the offspring?
- When did it give birth before that?
- What happened to the offspring? and so on until you reach the first birth.

Of course, this approach can be used not only for cattle but also for other livestock species. You need data from 100 female animals to obtain a reasonably good idea about reproduction, mortality and offtake. An example of analysis of such data is shown in Table 1. Here “cow years” are calculated by deducting the average age at first calving from the actual age. For calculating the calving percentage the no of calvings are divided by the number of cow years.

Table 1: Example of calculating calving percentage from life histories of cattle

Age of cow (years)	Average age at 1 st calving (years)	Cow years*	No. of calvings	Calving percentage
8.5	3	5.5	4	
6	3	3	2	
7	3	4	3	
5	3	2	1	
Total		14.5	10	100*(10/14.5) =68.9%

* cow years are an indicator for time span during which an animal can be really reproductive. It is calculated as present age minus age at first calving (here an average was taken).

In the case of sheep and goats, it becomes a bit more complicated, since twin or even triplet births occur and the mortality rate of young stock can be high. You do not need very precise figures; you need to know whether young stock mortality is 10% or 30% or 50%. If it is 50%, then interventions are justified; if it is 10%, the mortality rate is acceptable. If an intervention can halve the mortality of young stock, then from a total of 20 animals born in a year, you could improve the survival rate from 10 to 15 animals if the mortality was initially 50%, from 14 to 17 animals if the mortality rate was 30%, and only from 18 to 19 if the mortality rate was 10%.

It may be of interest to check whether there is a difference between survival of kids/lambs born in single births, twin births or triplet births. Findings in other countries in sub-Saharan Africa indicate that there is a difference in survival rates between single and twin births in sheep, but not in goats. Triplets have a harder time (and occur more often in goats than in sheep). The recommendation to the farmer may be to take special care and provide extra feed to ewes having twins or to goats having triplets.

A check for reliability of owners’ opinion is to determine the “tooth age”. In ruminants, the milk teeth incisors (at least three pairs) are present at birth; the fourth pair appears shortly after birth if not present at birth. Age as indicated by permanent dentition is shown in Table 2.

Table 2: Approximate age when permanent teeth appear in cattle, sheep and goats

Dentition	Species	Age of cattle (months)	Age of sheep (months)	Age of goats (months)
Appearance of 1 st molar		5–6	3	5
2 nd molar		15–18	10–11	8–10
3 rd molar		24–28	15	18–24
Change of 1 st pair of incisors		14–25 (1.5 years)	12–18	14–19

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2 nd pair of incisors	17– 33 (2.5 years)	18–24	19–24
3 rd pair of incisors	22–40 (3 years)	24–30	24–30
4 th pair of incisors	42–48 (3.5–4 years)	36–40	30

Early-maturing breeds tend to develop teeth early, and late-maturing breeds later. I am not aware of any dentition studies on Nguni cattle (which are early-maturing). A table for Boran cattle (large zebu) confirms the data given above for cattle (Barrett & Larkin 1974).

The “tooth age” can help to weed out gross faults when “interviewing cows” (or other livestock species). A cow with four pairs of permanent incisors can hardly be only 2.5 years old and an animal with only two pairs of permanent incisors is unlikely to be six years old.

Reference

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Appendix 2: Major findings in study areas

Appendix 2 a: Maria Trost

Importance of different animal species for different animal functions.

Species → Functions↓	Cattle	Goats	Pigs	Dogs	Geese	Chickens	Beans placed /Participants	Comments
Draught	Only cattle						10 men 2 women	
Meat /men	14%	22%	24%			32%	50/10	
women	40%	20%				40%	10/2	
Milk /men	98%	2%					50/10	
women	100%						10/2	
Hides/skins, men	83,6%	16,4%					55/11	
women	100%						10/2	
Selling/saving men	38,2%	10,9%	29,1%	3,6%		18,2%	55/11	Confusion selling/saving
women						100%	10/2	
Security (watch- dog) men				67,3 %	32,7%		55/11	
women				100%			10/2	
Hunting				(women don't hunt)			Only men 10 men	Not so important for some
Paying lobola men	67,7%	31,3%					65/13	
women	70 %	30%					10/2	
Cultural slaughter men	50,8 %	30,2 %				19%	63/13	
women	46,7%	53,3%					15/3	

For each function each man got 5 white beans to be divided among the species which fulfil that function. Women 5 red beans (colour not important, except that men and women got different colours)

Dog selling: puppies are sold 6-8 weeks after birth, so sales are “supply driven”. Adult hunting dogs (adults may be sold at any time).

Differences between men and women: women's group was very small (2-3) The main difference in opinion is in selling, where men indicated a range of species, but women only chickens. Another interesting point in discussion, was that men wanted to discuss chickens on day two and not goats, even though goats are men's animals.

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Forage profile according to farmers at Maria Trost.

Forage type	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Season	summer	-----	End Autumn		Winter--	-----	-----	Spring-	-----	Summer	-----	-----
Veld	Greener, taller	Tougher	Drying	-----	Dry,	being	burnt	Getting	green	Greener	taller	-----
Dairy cattle feed *												
Cabbage leaves *												
Maize fields					xxxxx	Xxxxx	xxxxxx					
Cattle condition	Slowly gaining weight		Stagnate		Stagnate	Slowly losing condition	More quickly lose cond.	Slowly picking up again	Quicker	Picking up	-----	Improvement slowing down
								ploughing				
comments						Need for	extra feed					

* one farmer only

Opinion of farmers: [the past farmers could cope with variable conditions but the situation becomes worse](#). There is not only a need for extra feed for dairy cows, but also for animals which do ploughing. Various options were discussed, like making hay (difficult in a region of summer rain), fodder radishes (seen during the International Rangeland Congress). Shortage of cultivable land is indicated by farmers as constraint for fodder production. Intercropping of maize and fodder was discussed but has the drawback that a good fodder stand reduces the maize yield, and when the maize yield is not affected, there will be very little fodder.

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Major findings:

Lack of forage in winter is indicated as problem. The hills make irrigation impractical. As there is a total lack of fodder, mature Napier grass (as long as it grows) can contribute. However, even Napier grass (which can produce very high yields) needs space (this would be a carry over strategy).

Farmers complain about the “lack of bulls” so some sort of support for cattle breeding may be useful. There is also an indication of calving intervals longer than one year which may also indicate the need for mineral supplements.

Disease not mentioned in cattle but in poultry.

- Community based animal health workers
- Chicken vaccination
- Fodder cultivation/conservation? (e.g. forage radish)
- Support for chicken enclosures
- Animal breeding for cattle (Nguni bulls?)

Study indigenous livestock management
Appendix 2 b: St. Bernard's study area

Importance of different animal species for different functions of livestock at St Bernard's

Animal species Function	Cattle	Goats	Chickens	Pigs	Cats	Dogs	Donkeys	Participation (beans/people)
Draught	Cattle only (1 woman uses hoe cultivation)							
Milk	Only cattle milked							
Meat , men	30%	20%	34,3 %	15,7 %				70/14
women	35%	15%	35%	15%				20/4
Selling , men	22,7%	18,7%	32,0%	14,7%		12,0%		75/15
women	19,0%	14,3%	33,3%	14,3%		19,0%		21/4
Production of traditional attire men	55,7%	42,9%	1,4%					70/14
women	45%	50,0%	5,0%					20/4
To eat rats and mice					Cats only			
Security						Dogs only		
Hunting								
Lobola , men	60%	40%						70/14
women	60%	40%						20/4
Slaughtering for customary purposes , men	41,4%	34,3 %	24,3%					70/14
women	35%	35%	30%					20/4
Carrying water and fire-wood	See comments							
Whose responsibility?	Men	Men	Women	Men and women (men buy them, women look after them)	Women	Men-women feed them	Women	

line up men women in graph

8 people stated that donkeys are used for carrying water and firewood. Donkeys may be hired for this purpose. 8 people indicated that they use cattle for carrying water and firewood – apparently this is done on sledges.

Out of 19 people 3 households did not have cattle.

All household had chickens/7 households don't have goats/Only 3 don't keep cats/Only 1 doesn't have dogs
 2 homesteads have got pigs (pork must then be bought)

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Forage calendar, cattle

Month Forage type	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Comment
Season	Summer	----	----	Autumn	-----	Winter	-----	Mid-spring	Spring	Summer	-----	-----	
Veld													
*Ngongoni Aristida spp.	X	X	x	X	x	x	X	x	x	x	x	x	Plenty
*Mtshiki Cynpogogon spp, Eragrotis and Sporobolus spp.	X	X	x	X	x	x	X	x	x	x	x	x	Available
*Isikhonko	X	X	x	X	x	x	X	x	x	x	x	x	Rare
*InSinde Themeda triandra	X	X	x	X	x	x	X	x	x	x	x	x	Very rare
*Kikuyu (Cynodon spp.)	X	X	x	X	x	x	X	x	x	x	x	x	Around homes only probably Cynodon
Maize straw						x	X						
Maize grain													Rare
Napier					X	x	X						
Sugar-cane													First year of sugar cane, future option
Profil	Continue improve even flatter	----	----	-----	Stagn.	Declining condition			Cond. Improves fast	Continue improve flatter	-----	-----	Decline condition worries farmers a lot

Study indigenous livestock management

Major findings:

- Cattle have extremely long calving intervals and start giving birth late
- Milk yields quoted appear rather high (is this a reason for animals not conceiving?)
- People want to discuss pasture management and want help for construction of a fence
- People have a number of committees already.
- Tick control is carried out fairly intensively (3 types known)
- No thought on possibility of tick resistant animals
- Goats were affected by disease last year
- Chickens are giving substantial amounts of feed – giving or given feed
- Starting to construct chicken enclosures
- Animal theft is widespread

Possible interventions:

- Mineral supplements, tailor made
- Community-based animal health workers
- Chicken vaccination
- Pasture management (needs further discussion)
- Support for chicken enclosures
- Animal breeding for goats and cattle (local bucks, Nguni bulls?)

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Appendix 2 c: Reichenau study area

Species Functions	Cattle	Sheep	Pigs	Goats*	Chickens	Ducks*	Dogs	Cats	Horses	Turkeys	Geese	Pigeons	Commercial chickens	Beans/pers.
Sales	63,7 %		12,7%	No one	20%								3,6 %	55/11
men														
women	33,3 %	13,3%			13,3%					13,3%	20%		6,7%	15/3
Meat,	18,1%	21,8%	12,7%	present	38,2%								9,1%	55/11
men														
women	6,6%	26,7%	13,3%		33,3%					13,3%	6,6%			
Lobola	Only cattle			owned										
Milking	Only cattle			Goats										
Customary slaughter	72,8%	5,2%											23,1%	
men**	7 f													
women	100%													
Security							Only dogs							
Hunting							Only dogs							
Draught	Only cattle													
Riding									Horses only					
Who takes care?	Men	Men	Women	Men	Women	Women	Men & women	Women	Men	Women	Women	??		

* nobody among the people present owned goats or ducks, according to a farmer visited ducks are used for eating and selling.

** customary slaughter is either not popular or people have difficulty admitting that is still being done (meeting was on church premises)

Commercial chickens are owned by a few people only, turkeys and geese by even fewer people, but one woman from an ethnic minority (San) was proud to report, that her brother kept turkeys and could sell them at 150 Rs a head.

Study indigenous livestock management

Fodder calendar cattle, Reichenau

Fodder source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Seasons	Summer	-----I	Autumn		Winter	-----	-----	---- Spring	-----	Summer	-----	-----
Veld	xxxxx	xxxx	xxxx	Xxxx	xxx	xx	Xx	xxx	xxxxx	xxxxx	xxxxx	xxxx
Maize Straw						xx	X	x				
Eragrostis hay (bought or planted)					x	(x) 0.5	X	(x)				
Cut veld (hay)					x	(x) 0.5	X	(x)				
Maize Grain								(x)				
Premix	licks used by one farmer only											
Saltmix												
Molasses Australick												
Profile Cattle condition	Slow impr.	Stag.	Stag.	Stag.	Decline	Furth. decline	Fast decline	Fast decline/ Condi. Impr.	Fast Impr.	Further improve	Top condition	Slow improvement

Obviously people are aware of the change in condition and already do something, but in an expensive way and not enough.

Study indigenous livestock management

Major findings

- Most intensive agriculture in study
- People are already using inputs and have easy access to veterinarian (Underberg is nearby)
- Cattle breed is rather mixed, Nguni cattle are regarded as “unproductive”
- Great diversity of species being kept.
- Great difference between richer and poorer farmers. Farmers visited were fairly affluent

Possible intervention

- Forage cultivation e.g. fodder radish
- Propagation of Nguni cattle breed (lowers need for input)
- Information on turkeys, geese etc on request
- Request for bee keeping was received. Here local bee keeper should be approached.

Appendix 2 d: Msinga study area

Importance of different animal species for different functions of livestock at Msinga

Species→ Function↓		Cattle	Goats	Chickens	Sheep	Dogs	Ducks	Cats	Attendance/stones placed
Meat/	men	37,2	23,3%	20,2%	12,4%		7,0 %		26/129
	women	35,2%	31,0%	19,7%	14,1%				15/71
Money/	men	24,1%	44,8%	19,0%	11,2%	0,9%			24/116
	women	21,6%	33,8%	41,9%	1,4%	1,4%			15/74
Draught/ploughing	Cattle only								
Sacrifice/	men	34,4%	46,4%	16,8%	2,4%				25/125
	women	32,9%	38,4%	26,0%	2,7%				15/73
Lobola/	men	45,6%	37,6%		16,8%				25/125
	women	61,8%	38,2%						15/76
Milk	Cattle only								
Eggs				Chickens only					Eggs are often bought at shop
Guarding						Dogs only			
Driving goats Guarding chicken						Dogs only			
Bite snakes Eat rats								Cats only	
Caretaker, manager	Men	Men	Women	Men	Men	Men/women		Women	

Comments: There are three real differences between men and women in the perception of functions of livestock:

- greater importance of chickens for money for women,
- greater emphasis on chickens for sacrifice by women,
- men placing greater emphasis on small ruminants (sheep) for paying lobola.

The relatively great importance of sheep for meat does not tally with livestock holdings, where few sheep are kept. There was some mentioning of buying mutton in shops. The fact that only men appear to eat ducks is probably more closely related to not knowing ducks, which are rare and relatively new to the area.

Study indigenous livestock management

Forage availability/trends over the year

Seasons =>	Oct/Nov/Dec/Jan/Feb/Mar/April	May/June/July/Aug/Sep	comments
	Long days, warm to hot, rain likely	Cold, little rain (once in winter), short days up to mid-August, September: Rain expected, longer days, warming up)	
	High tick pressure throughout	Low tick pressure, ticks starting in mid-Aug.	
Forage		Calving period mid-Aug/Sept.	
Trees, Olives/Acacia, branches Tree Fuschia <i>Schotia brachypetala</i> (common hardwood)		Whole winter	
Mbanjane (grass spp)	Up to Feb, Mar/April ?,		Eaten when green
Ubabe (grass spp)	Till April , but diminishing from March		
Isinandi (grass spp)	Throughout the year	Diminishing	
Maize stubble (Izinhlanga)		May, in other areas June, kept on fields because little else available	
Cow needs	Increasing after calving, stable for several months	Decreasing but going up two months before birth	
Food on offer/cow condition	Getting better. Then improvement slows down, towards end plateau	Conditions getting worse. Decrease in condition initially slowly, later accelerated Possible problem period July/Aug Some cows give birth, but don't get up.	Possible reasons for cows not getting up after birth: lack of feed, minerals (ask a vet).

Major finding:

- Good reproduction in cattle and goats, presently no major disease.
- Farmers know about dipping and other modern medicines and use them. Dosage, storing are problems as are expiry dates.
- **Dipping is used fairly intensively, Animals that are naturally tick tolerant are recognised, but this resistance is not used as a sought after value in animal breeding.**
- People like big animals, Nguni (most of the cattle look like Nguni) not particularly liked. (Ngunis would reduce the need for dipping and the cost of animal medicine)
- Some nutritional problems with cattle and goats in late winter (dry season). No forage crops thus far.
- Crop production: common crops are maize, sorghum and beans. No specific winter crops (commercial farmer in area plants wheat).
- No readily available dual purpose crop. Available cultivars are either for forage (e.g. the Free State cultivar of Pearl Millet) or for food (cow peas) – Can farmers try out new things?
- Crops are affected by drought, and crops varieties in use are not particularly drought resistant.
- Manure is presently not used, (however crops on manured fields are more drought resistant and manure HELPS (does not do the whole job) to maintain soil fertility.
- Chickens suffer from predation, and in areas with larger population densities suffer from diseases.

Possible intervention points:

- Crop variety trials with more drought resistant cereals (millets), forage crops, dual purpose crops
- Promoting storing of forage for late winter/early spring
- Training of CBAHW
- Chicken vaccination groups in more densely populated areas
- Chicken enclosures to reduce predation losses.
- Promotion of Nguni breed for cattle

Mcp of Kwazulu Natal

(A) Mdukatshani's area of work in Msinga/Weenen

