Smallholder Cattle Production Dynamics: A Case Study from South Africa

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"Africa would not be able to produce a surplus above current consumption levels, nor would it lay the foundation for sustainable development, if African farmers are not sufficiently empowered to use productivity techniques of their choice in producing what they
think is profitable"
(Deng et al., 1995)

Context (1)

- Challenge to overcome hunger
- Africa
  - 30% of the population, mainly women and children, suffer from malnutrition
  - 50% of the African population live below the poverty line of US$1 per day
- Sub-Saharan Africa: 30% of people live in absolute poverty
- Prospects for improvement challenging

Context (2)

- Africa's human population growing at an average rate of 2.7% over the past 20 years
  - Currently estimated at 832 million
  - Projected to increase to 1.2 billion by 2015
  - Urban population has been growing at an even higher average rate of 4.2% over the last 20 years
    - Estimated that by 2015 about 490 million people (approximately 45% of the total population) will live in cities and large towns
  - This growing urbanization will further amplify the growth in demand for food of animal origin (*Livestock Revolution*), because the urban population generally has higher incomes than those living in rural areas

MDG's – 10 years ago

- Poverty and hunger: MDG 1
  - >30% of agricultural GDP in Africa
  - Source of livelihood for 1 bill. people in developing countries – 40% poor
  - Sector value: $1.4 trill. globally
- Health: MDG 4, 5, 6
  - 60% of the world's poor dependant on livestock
  - Provide food for at least 830 million food insecure people
  - Income from livestock and stronger position of women as owners reduce vulnerability to HIV/ Aids and other diseases

MDG's

- Climate Change, Energy, Sustainable Natural Resources, Water: MDG 7
  - 60% of global cropping – manure
  - Nutrient cycling ("walking crops")
- Gender: MDG 3, 4, 5
  - Meat, milk and eggs provide 20% of the protein in African diets
  - Reduce child mortality and improve maternal health
  - Livestock keeping provide women a chance to earn higher income, reducing gender inequality
- Importance in attaining the Millennium Development Goals should not be underestimated

Major reviews of the literature conclude that whether technology benefits poor people depends not on the characteristics of technology *per se*, but more so on underlying socio-economic conditions

(BANR, 2008; Hazell and Haddad, 2001)

Smallholder cattle production dynamics in South Africa

In South Africa, livestock production is a major component of rural agriculture. Livestock and its products (meat and milk) provide food for home consumption, are sources for income, represent a form of capital that is easily converted into cash and provide draft power and manure. However, in general, the productivity of these systems is relatively low.

Multifunctionality of Livestock

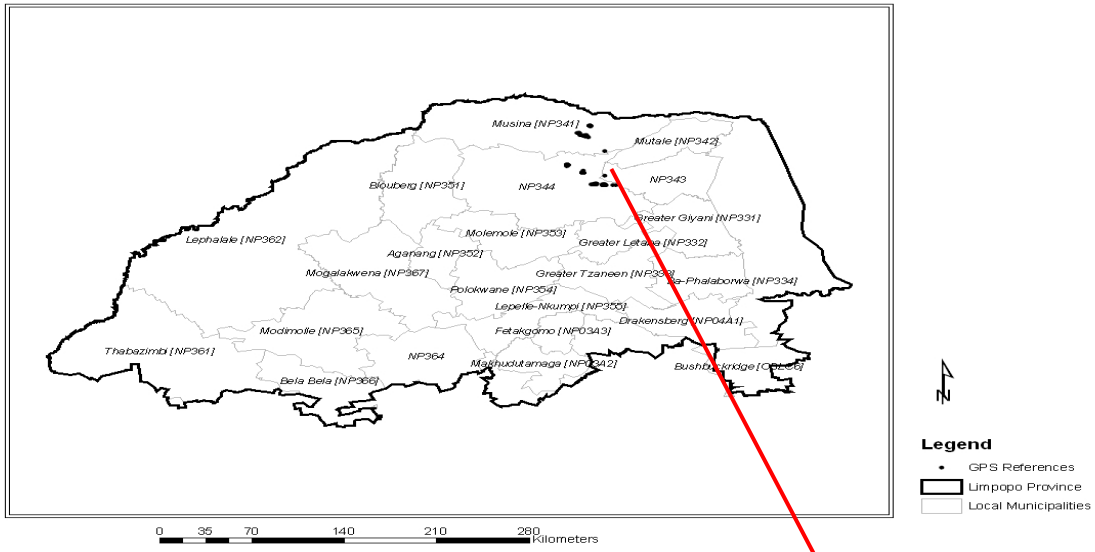
Summary of Benefits and Products Derived from Livestock

Food	Milk; meat; eggs; blood; fish; honey; processed products.
Clothing	Wool; hides; skins; leather.
Work	Draft power – cultivation; transport of goods and people; threshing; milling; pumping water.
Monetary	Capital wealth; investment; savings account; income from: hiring working animals; sale of products; sale of animals.
Social	Lobola (bride price); ceremonial; companionship; recreational; status.
Manure	Fertiliser (soil amendment); fuel; flooring.
Other benefits	Feathers; bone meal; soap production.

The objective of this paper is to

- Report on the productivity measures and herd dynamics of cattle herds of smallholder owners under communal tenure in the northern part of South Africa
- Contextualise the findings within a policy and action framework

Study Area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Kilometers
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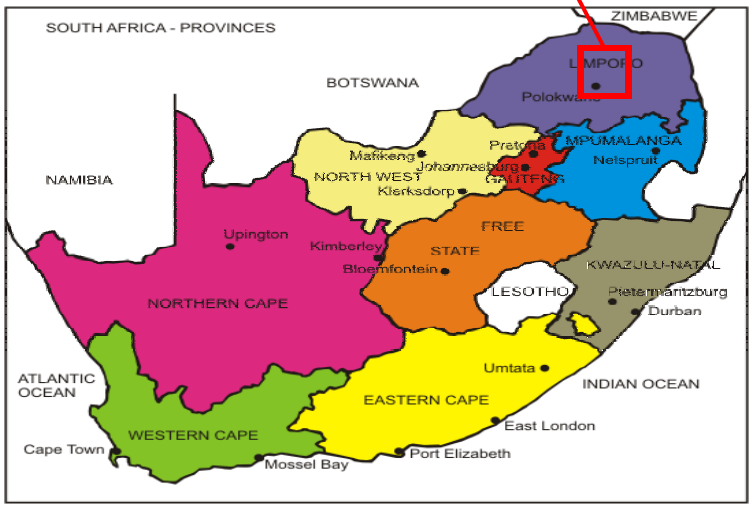
GPS References
Limpopo Province
Local Municipalities


SOUTH AFRICA - PROVINCES
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Klerksdorp
FREE
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Bloemfontein
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LESOTHO
Pietermaritzburg
Durban
NORTHERN CAPE
Umtata
ATLANTIC
OCEAN
INDIAN OCEAN
EASTERN CAPE
East London
WESTERN CAPE
Cape Town
Mossel Bay
Port Elizabeth

Herd dynamics and productivity measures (1)

Herd size summaries

Herd size category	Percentage
1 - 5	30.2
6 - 10	38.4
11 - 20	19.3
21 - 30	10.2
>30	1.1

Herd dynamics and productivity measures (2)

Herd composition (N = 888)

Herd class	Total	Percentage
Cow	405	45.6
Bull	136	15.3
Heifer	323	36.4
Steers	24	2.7
Total	**888**	**100.0**

Herd dynamics and productivity measures (3)

Efficiency parameters

Factor	Months	Percentage
First calving age	33.9	-
Calving rate		49.2
Weaning rate		33.3
Calf mortality		27.1
Herd mortality		15.7
Offtake		8.7

Discussion
Herd size and composition

The number of cattle owned varied from one to 72, with an average of eleven (11.3) head of cattle per household, of which 68.6% own ten or less head of cattle. Cows form the largest part of the herd (45.6%).

These findings suggest that male animals (bulls and steers) are either sold for cash income, or slaughtered for home consumption. According to the herd composition, animal traction is not regarded as very important. The bull to cow ratio is 1:2.98.

Discussion
Herd mortality and offtake

Herd mortality in this study is 15.7%. Such a high mortality obviously represents a considerable loss to farmers constituting twice the offtake percentage of 8.7%.

However, it should be remembered that in most cases of cattle deaths, part of, or the entire carcass is consumed by the household. This high mortality rate could have been aggravated by the severe drought experienced during the year of the study in this area.

Discussion
Herd mortality and offtake (cont.)

The low offtake figure of the present study (8.7%), emphasises the fact that there is a need to encourage the communal farmer to increase offtake from their herd and to establish an appreciation of improved productivity and quality, instead of animal numbers only.

Discussion
Reproduction

The average age at first calving is 33.9 months, followed by a calving interval of 24 months, with a calving percentage of 49.2% as a result. There is no distinct calving and breeding season, which is evident from calves being born throughout the year with the peak being during the summer months, associated with the uni-modal rains (December – February) in this area.

Consequently, two-thirds of cows calve during this period. Extended drought periods are common to this area and therefore also contribute towards the lower reproduction rates. Another reason for the longer intercalving period could be the fact that only a very small number of farmers (2%) wean calves.

Discussion
Reproduction (cont.)

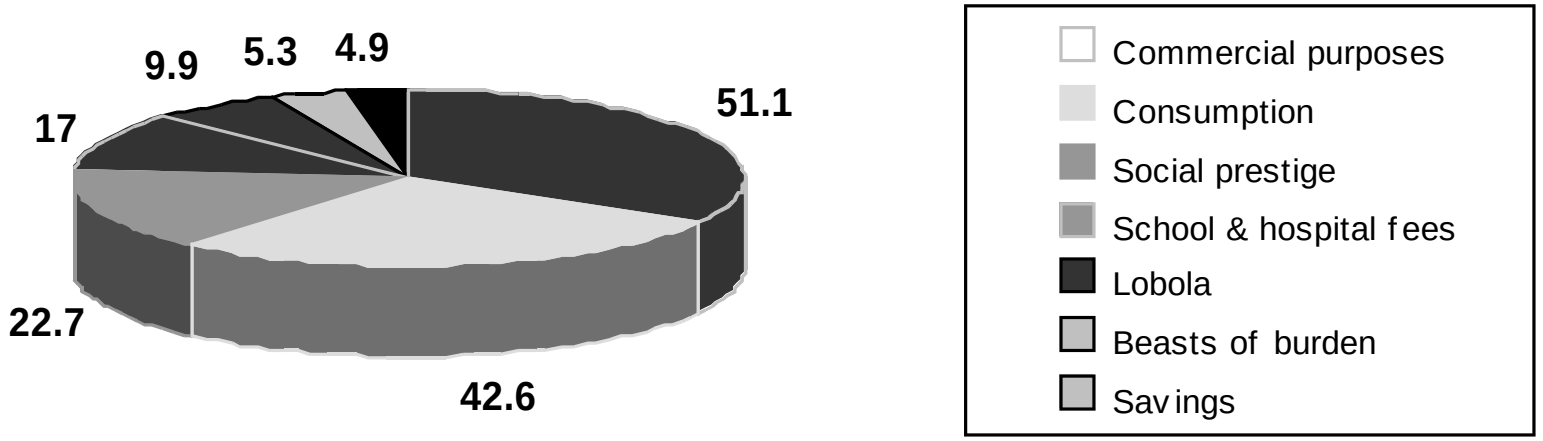
Despite the fact that a large number of farmers milk their cows for home consumption, none of them indicated that this was the main reason for farming with cattle. Herd management, particularly milking strategies, may play a role in contributing towards the low reproduction rate, especially the longer calving interval.

Milking strategies of herd owners are guided by a complex set of factors such as herd size, family subsistence needs and whether there is a market for milk. Within the herd, the yield potential of cows and the condition of the calves influences milking frequency and dairy milk production.

Discussion
Reproduction (cont.)

Within this study, herd size and cattle wealth (number of cattle per person) influences milk offtake, since milking is primarily focused on household food needs. Thus, the number of cows in milk is negatively correlated with milk offtake yield.

Reasons for keeping livestock



* ***Some of the respondents provided more than one motivation, therefore percentages add up to more than 100%***

Discussion
Main reasons for farming with cattle

Despite the fact that a large number of farmers milk their cows for home consumption, none of them indicated that this was the main reason for farming with cattle. Cash-related reasons (commercial purposes and school and hospital fees) were cited by 68.1% of the farmers as the main motivation for farming with cattle, while 22.7% kept cattle for social prestige.

These results indicate that smallholder farmers in this region are more commercially-orientated than others in South Africa, where capital wealth, social prestige, lobola and consumption are given as more important reasons for farming than cash-related reasons.

Discussion
Main reasons for farming with cattle (cont.)

Although social prestige and capital wealth was only cited as the third-most important reason for keeping cattle, it confirms that there is a social-economic status related to the ownership of cattle.

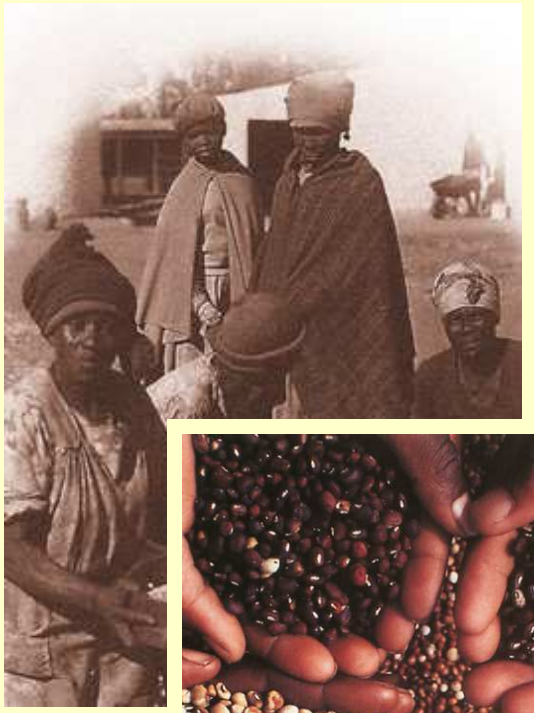
This is commonly referred to as the **"cattle complex",** where cattle are kept for prestige and status and not for production.

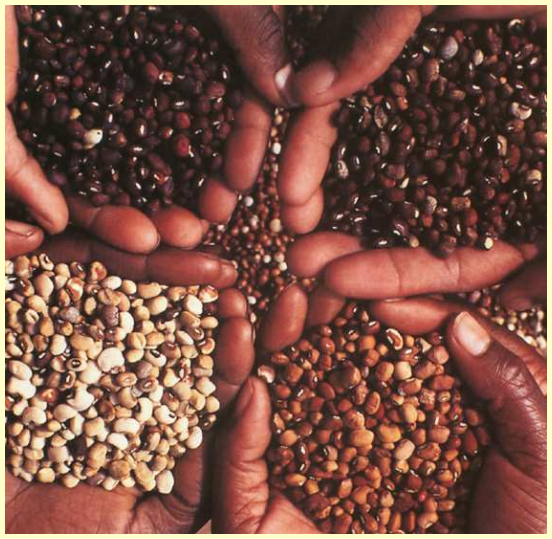
Discussion
Main reasons for farming with cattle (cont.)

The fact that socio-economic status can be regarded as being a very useful predictor of successful and progressive cattle farming, is important in this analysis.

This conclusion and the fact that cattle farmers had a high socio-economic status in their communities, emphasises the relationship of rural livestock production to his/her social development.

Conclusion

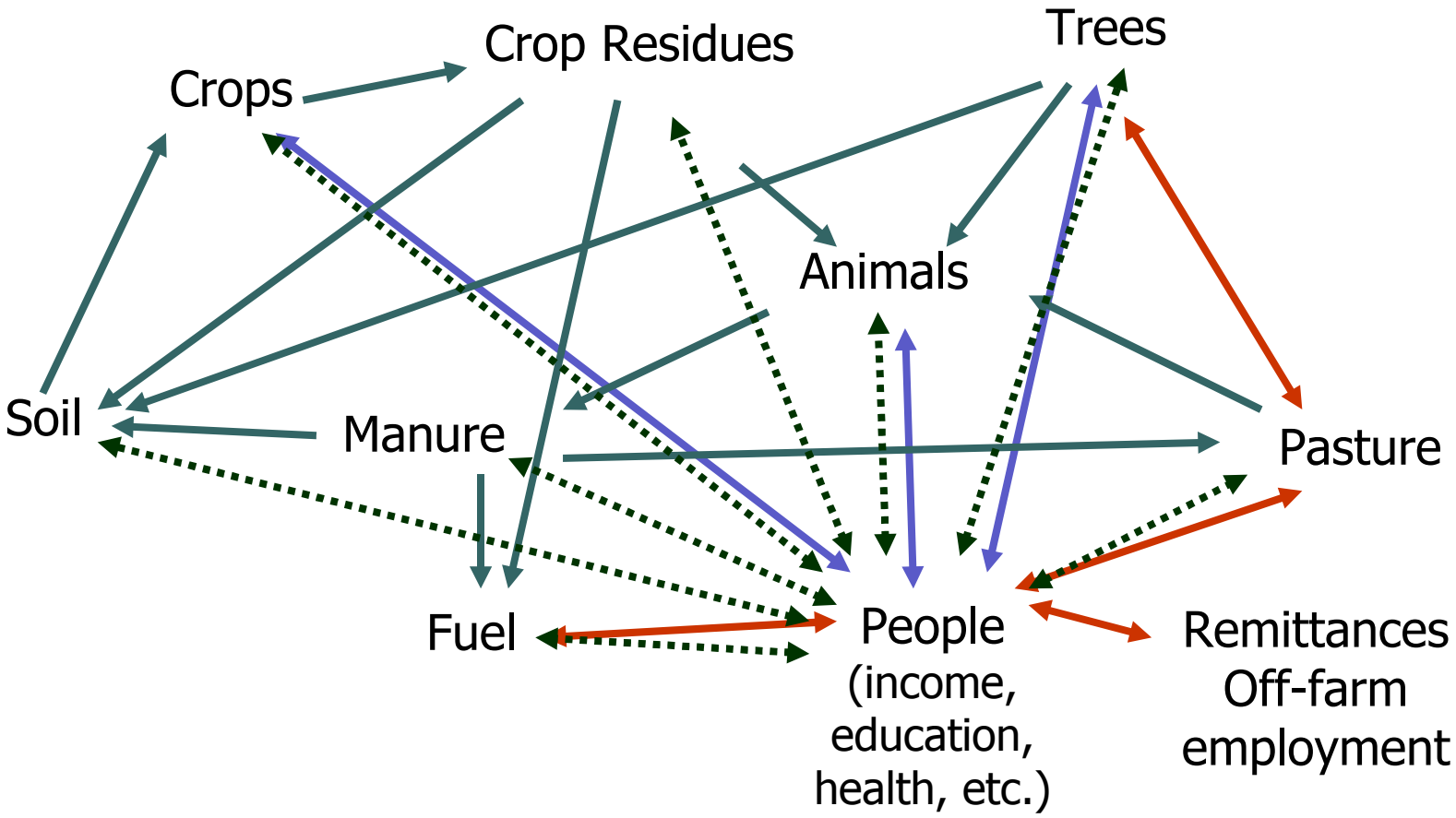




The productivity measures of cattle in this study are generally low with respect to reproduction and offtake percentages and high in terms of mortality.

The word "production" is relative, especially when comparing two systems which from the outset have different objectives, as is obviously the case between smallholder communal and commercial producers in South Africa.

Complex Dynamic Systems



Knowledge to Action

Reducing Poverty, Hunger and Environmental Degradation

OUTCOMES

Securing assets to reduce vulnerability
- Enhancing health of livestock, keepers & consur
- Conserving & using animal & feed genetic resourc
- Enhancing ecosystem services

Increasing productivity
- Improving livestock genetics, health & nutriti
- Increasing incomes of poor livestock keepers to improve livelihoods

Expanding markets to increase incomes
- Improving market access for smallholders
- Reducing costs of food for poor consumers
- Increasing food safety

OUTPUTS

Biotechnology for livelihoods
Biosciences & bioinformatics products and platforms

Livestock, people & the environment
Natural resource management solutions for livestock systems

Market opportunities
Interventions to enhance smallholder market participation

ACTIVITIES

Where to go?
Livestock & poverty priorities and policies

How to get there
Innovation systems, impact assessments, gender analysis

Research core competencies and innovations systems framework

DYNAMIC LIVESTOCK SECTOR

Increasing demand in developing countries • More complex pathways & longer market chains • Supermarket revolution • Food safety demands • Pressure on natural resources to double livestock production

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