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Evaluation of farmer's perceptions on range condition in Peddie communal areas of the Eastern Cape, South Africa.

Grassland Society of Southern Africa
Advancing Rangeland Ecology and Pasture Management in Southern Africa

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Introduction

- Communal farmers perceptions (CFPs) have been overlooked by rangeland scientists and policy makers (Oba & Kaitira, 2006).
- They underpinned that CFPs lack objectivity and communal farmers cause resource overexploitation.
- However, communal farmers are part of natural ecological systems hence they should be recognised (Kassahun et al, 2008).
- CFPs can be used in tandem with ecological methods of range evaluation (Angasa & Oba, 2007).
- CFPS also aid in obtaining data of local conditions with reference to degradation, thus adding value to scientific research (Angasa & Oba, 2007).

Justification

- CFPs on range condition in communities that are recipients of the Nguni Cattle Project have not been assessed.
- The findings of this study would provide qualitative information that can be interlinked with scientific data to:

  - Make recommendations on appropriate range management practices to improve forage production and reduce degradation in Peddie rangelands

  - Ensure sustainable use of range resources by communal farmers and the success of the Nguni cattle project

Objectives

- To evaluate CFPs on current range condition and management of the Peddie rangeland.
- To investigate vegetation and livestock dynamics, their causes, and time frames of these dynamics.

Hypothesis

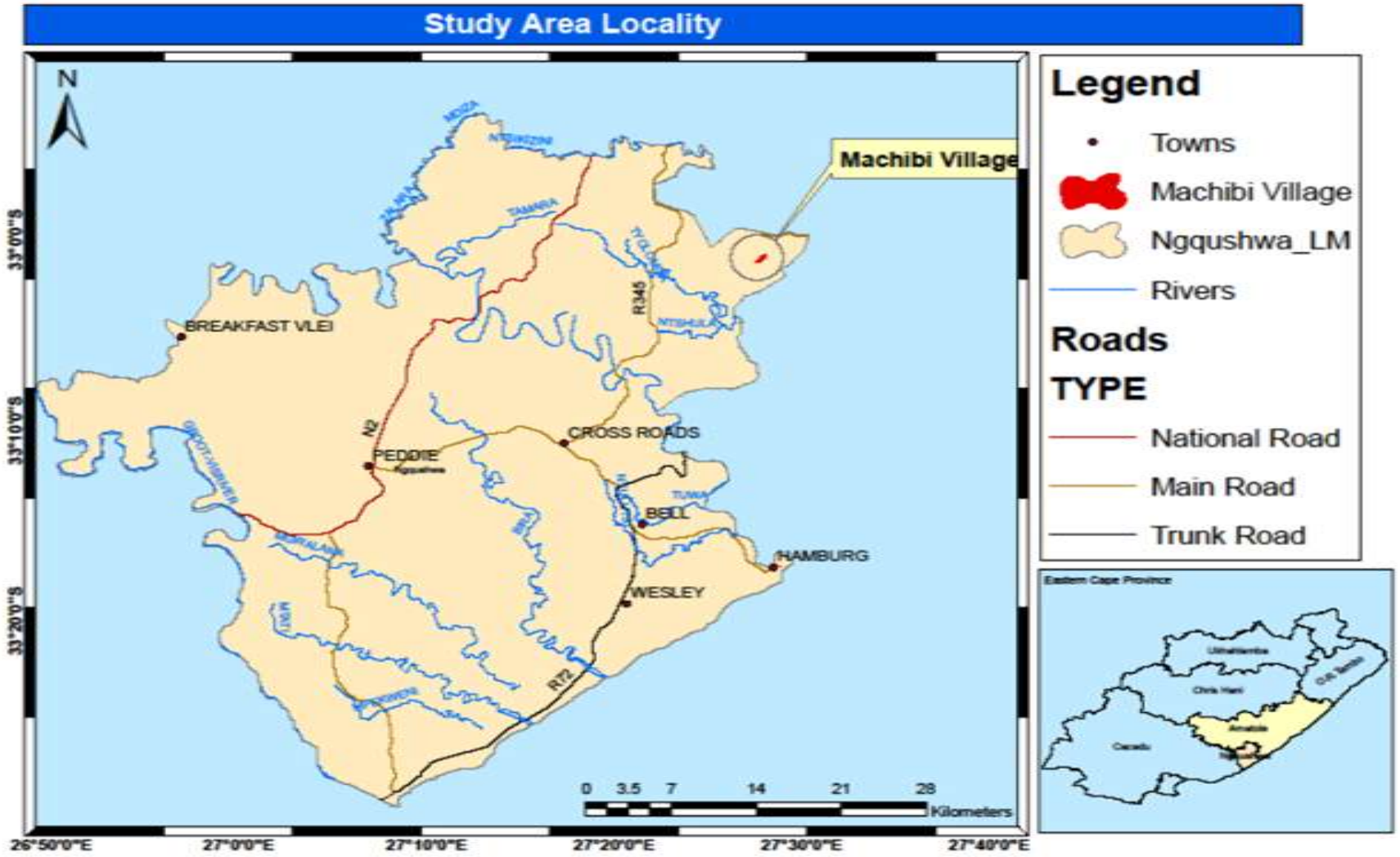
Communal farmers at Peddie communal area have qualitative knowledge of the past and current condition of their rangeland.

Methodology

Site description

- The study was conducted at Machibi communal area at Peddie under Ngqushwa municipality (32^0 59’ 37” S and 27^0 25’ 56” E).
- Average temperatures = 19.3^0C in July and 25.8^0C in February.
- Annual rainfall = 412mm which is prevalent in summer.
- Woody Vegetation comprises of *Acacia karoo, Coddia rudis, Diospyros scabrida* and some thicket species e.g. *Scutia myrtina.*
- Herbaceous species are *Themeda triandra*, *cynodon dactylon*, *Eragrostis plana*, some *forbs* and *karoo sp*.

Map of Peddie communal area and surrounding communities



Data collection

- Two structured questionnaires consisting of close and open-ended questions were used (Kgosikoma et al, 2012).
- These questions were related to farmers demographics, current and historical range conditions & livestock numbers.
- A sample size of 60 households owning herds was randomly selected.
- In each household a male key informant of age >40 years and a respondent of any age > 20 years were selected.
- The data was therefore coded and ranked in ordinal scale depending on significance of each parameter to farmers.

Statistical Analysis

- Descriptive statistics such as means, standard errors and percentages were used in demographic data, livestock numbers and structured questions.
- Mean rankings of ranked data were analysed by Friedman's χ^2 test.
- Sign test was also employed to find significant differences (P = 0.05) between causes of dynamics and uses of rangeland.
- Statistical Package for Social Science (SPSS version 20) was used.

Results and Discussion

Figure 1: Demographics of respondents in Peddie communal area

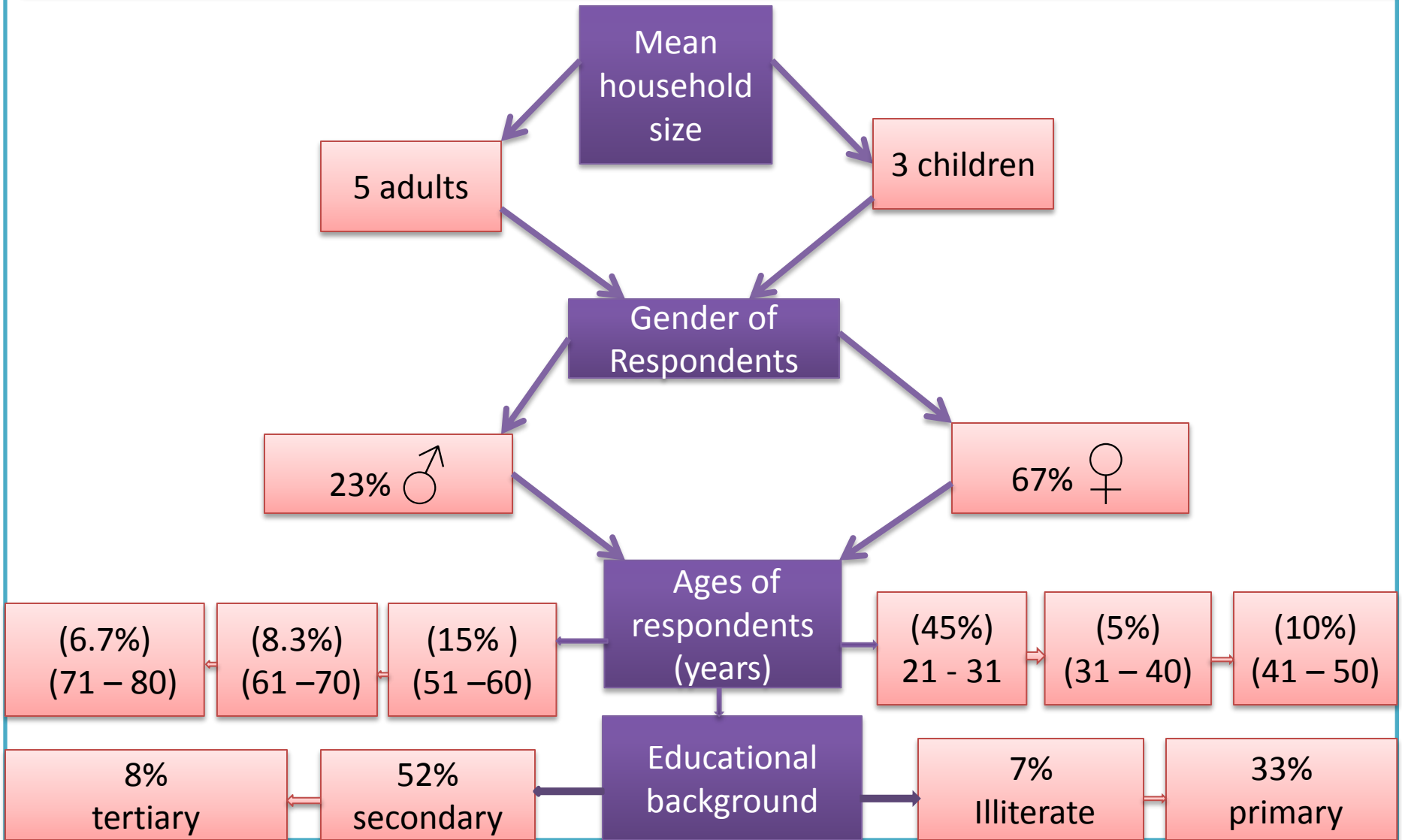
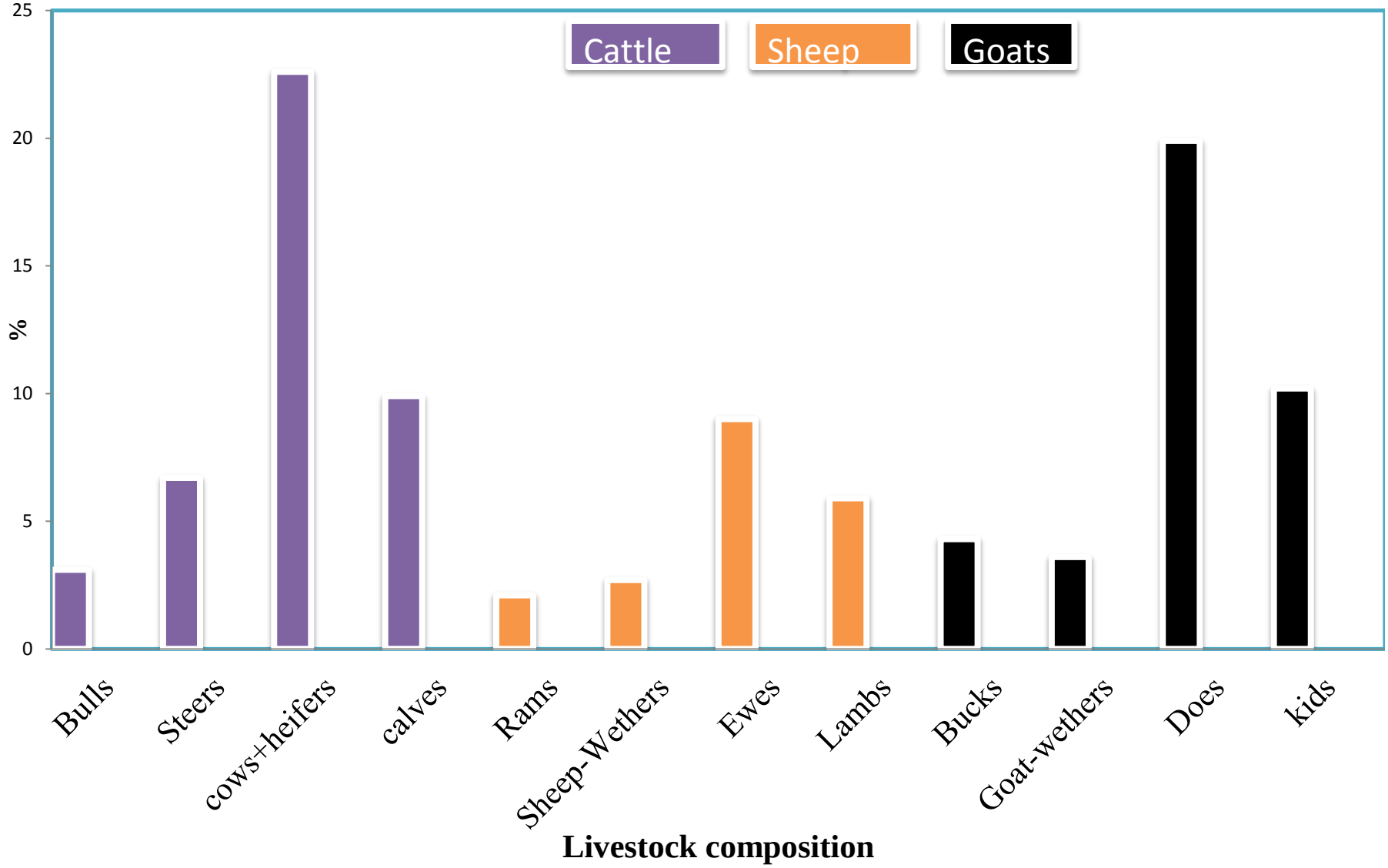


Figure 2: Frequencies (%) of livestock population and composition



- 83% of farmers perceived livestock numbers to have declined over 1 decade, and 100% farmers over 2 decades

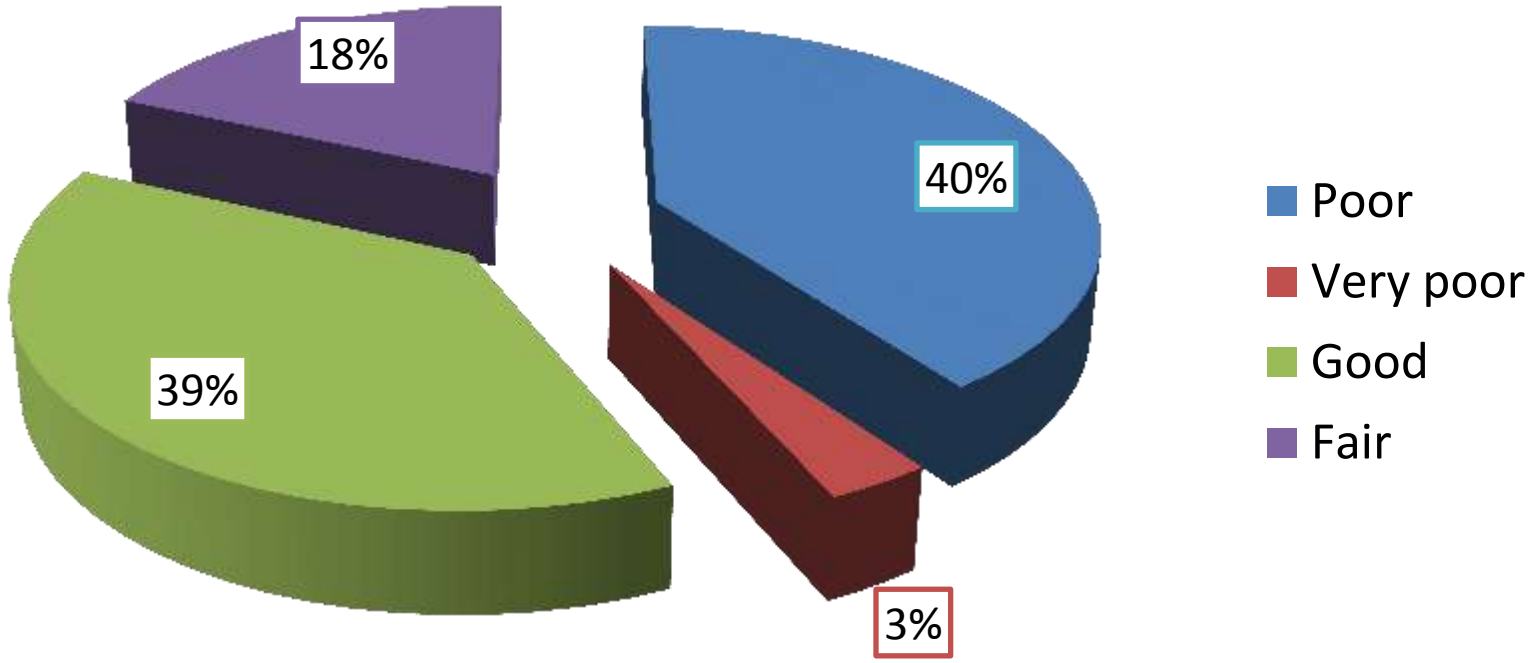
Table 1: Mean ranks of causes of livestock dynamics

Causes	Mean(±S.E)	Rank
Low forage quantity	2.09(0.118)^{a}	1
High bush density	2.40(0.202)^{abc}	2
Low forage quality	2.71(0.130)^{b}	3
Recurrent drought	2.89(0.202)^{bc}	4
Soil degradation	4.98(0.039)^{d}	5
Crop farming	5.93(0.067)^{e}	6

Means with different superscripts in a column are significantly different ($P \leq 0.05$).

- Range evaluation was conducted by 85% of farmers (n = 60) through sight and site visits

Figure 3: Farmer's perceptions on current rangeland condition



*Range condition indicators are grass (1.58±0.108), bush (1.50±0.085) and soil (2.92±0.047) condition.

Table 2: Mean ranks of perceived causes of current range condition

Causes	Mean(±S.E)	Rank
Bush encroachment	2.00(0.252)^{a}	1
Overgrazing	2.50(0.141)^{b}	2
Absence of burning	2.72(0.181)^{b}	3
Variable rainfall	4.03(0.241)^{c}	4
Human population	5.69(0.365)^{d}	5
Erection of Kraals, dip tanks, water points	5.72(0.248)^{de}	6
Topography	6.42(0.146)^{ef}	7
Soil depth	6.92(0.256)^{f}	8

*Means with different superscripts in a column are significantly different ($P \leq 0.05$).

- Vegetation change was perceived by 93.3% of farmers over 1 and 100% farmers over 2 decades.

Table 3: Mean ranks of perceived causes of vegetation dynamics

Causes	Mean(±S.E)	Rank
Bush encroachment	1.58(0.141)[a]	1
Human settlements	2.29(0.188)[b]	2
Overgrazing	2.90(0.139)[c]	3
Drought	3.94(0.180)[d]	4
Change in land use	5.35(0.285)[e]	5
Water-points, dip tanks, kraals	5.94(0.216)[e]	6
Land alienation	6.78(0.194)[f]	7
Crop farming	7.21(0.170)[f]	8

* Means with different superscripts in a column are significantly different ($P \leq 0.05$).

Uses of rangeland in Peddie communal area

Table 4: mean ranks of rangeland uses in Peddie communal area

Uses	Mean(±S.E)	Rank
Grazing & browsing	1.01(0.020)[a]	1
Firewood collection	2.48(0.110)[b]	2
Building & fencing material	3.04(0.130)[c]	3
Medicinal plants collection	3.57(0.077)[d]	4
Dry dung collection	4.90(0.053)[e]	5

Different superscripts denote significant differences ($P \leq 0.05$) between uses.

Discussion

- Farmers perceptions on range condition differed :
  - 40% perceived it to be poor due to bush encroachment which competes with & reduces herbaceous vegetation for grazers.
  - 39% said that it was in good condition because they keep goats and also harvest woody plants for household purposes.

- Farmers said the "Pool resource ownership" gives room for resource overexploitation.

- Overgrazing and human settlement were perceived as major causes of resource overexploitation & range degradation.

- Although overgrazing is a threat , 85% of farmers practised herd movements.

Conclusion and Recommendations

- The study indicated that the perception of range condition in the communal tenure system depends on type of livestock kept, and other forms of resource utilization.

- Therefore, CFPs can be used/compared with scientific quantitative range condition data for range improvement.

- Due to pool resource ownership, it is recommended that community chairman/tribal leaders need to be empowered to endorse rules and regulations for grazing and resource harvesting as follows:

Recommendations cont.....

- Wood harvesting must be bestowed to season, and herd movements must be practiced to counteract overgrazing.

- Wood Harvesting must target the most tall encroaching species and goat numbers must be increased.

- Introduction of livestock to drinking point must be sequential

(drink and go system) to counteract resource overexploitation around water point.

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Thank you

Be blessed