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Analysis of rangeland perceptions among potential land redistribution beneficiaries in South Africa: how well do potential emerging farmers know their rangelands?

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Abstract

Sound rangeland management is one of the key factors for a successful and viable commercial livestock production in grass fed production systems. However, such knowledge is perceived to be lacking in small-scale livestock farmers, who farm on degraded and overgrazed communal rangelands despite being regarded as prime beneficiaries of the land redistribution programme in the stalling South African land reform. Largely, it is also not known in details how much the potential future commercial farmers know about their rangelands. This study analyses perception of the prime land redistribution beneficiaries—potential emerging farmers, who were surveyed randomly in three South African provinces. Descriptive statistics of potential emerging farmers show that they perceive their communal rangeland as “poor”, concurring with scientific literature. However, their reasons of the “poor” status deviates from the reasoning of scientific literature, highlighting the potential emerging farmers’ knowledge gap of rangeland science. Ordinal Logistic Regression shows that farmers’ age and education level are significant predictors of the perceived rangeland status among potential emerging farmers. This underscores the importance of personal experience and education in rangeland assessment. Indeed rangeland management training is necessary for land redistribution beneficiaries prior taking over commercial livestock farms. These trainings should focus on more on younger and less educated beneficiaries.

Introduction

Since the transition to democracy in 1994, the South African government has been trying to redistribute commercial farmland in a just and equitable manner (see DLA 1997; LRAAP, 2019). The black commercial oriented smallholders (potential emerging farmers), mostly situated in the country’s former homelands are the prime beneficiaries (DRDLR 2013). However, to date there is a general consensus among stakeholders that land redistribution has not kept up with the target objectives set in land reform policies and there is poor or no production in the redistributed land (LRAAP, 2019). There is a plethora of explanations of why this is the case and one of these reasons include lack of farming skills and knowledge of commercial farming from emerging farmers (see e.g. Dlamini et al. 2013). Knowledge about rangeland management is a prerequisite to a successful livestock farming (see e.g. Tefera and Kwaza 2019), however, little details on a larger scale eliciting this exist. Since rangelands are the most abundant farmlands in South Africa (DAFF 2017), it is most likely that it would be the most redistributed farmland. Therefore, understanding a priori rangeland knowledge of land redistribution beneficiaries is important for the design of support. The objective of this study is to analyse potential emerging farmers’ perception of their own communal rangelands status and the perceived causes of such.

Methods and Study Site

This study is based on a survey of commercial-oriented smallholder farmers in the Eastern Cape, KwaZulu Natal and Limpopo provinces of South Africa and eight districts within these provinces. For the purpose of this study and inspired by previous studies such as Zantsi et al. (2020), smallholder household heads were purposively included in the study if they had sold at least 20% of their produce in the previous season. The provinces and districts were selected purposively based on the literature on provinces and districts with high density of smallholders. The three selected provinces represent 60 per cent of smallholders in the country (Statistics South Africa, 2016). However, at village and household levels, smallholder household heads were randomly selected. Four hundred and fifty-two livestock farming households were filtered from the 833 larger household survey sample and included for analysis in the present study. Descriptive statistics is used to

describe the characteristics of the farmers and their rangeland perception status. Ordinal Logistic Regression is implemented to analyse the relationship between rangeland perception status and socio-economic variables and livestock herd size.

$$\text{Ordinal logit}[P(Y \leq J_{1,2,3,4})] = \alpha_j - \beta_i X_i$$

Where $j = 1,2,3,4$ refers to ‘bad, good, fair’

$i = 1$ refers to ‘independent variables’

Results and discussion

Description of the sample and rangeland perception status

Table I below provides a summary statistics of the characteristics of the sample of farmers under study. The sample is mostly concentrated in the Eastern Cape and KwaZulu Natal provinces and few of the respondents hail from Limpopo. Males account for the largest share of the sample (64%) with an average age of 55, which is confirmed age for commercial oriented smallholder farmer in South Africa (Zantsi et al. 2019). The studied farmers have reasonable literacy levels as most had a secondary school education. As such, they have middle incomes with a mean of R7 853 per month and 22 livestock units.

Table 1: Summary statics of the dependent and independent variables used in the ordinal regression

Variable	Min.	Max.	Average	Std. dev.
Continuous variables				
Household head age in years	20	76	54	12
Household monthly income in Rands	320	100 000	7 853	10 509
Total livestock units	0.8	350	22	26
Percentages of the dummy and categorical variables				
Perceived rangeland status	Very bad=21%, Bad=32%, Fair=13%, Good=26% Very good=9%			
Perceived reason for the rangeland status	Insufficient rain=47%, No fences for practicing rotational grazing=3%, Good management=21%, Overgrazing=18%, Understocked=8%; Other reasons=2%			
District and the province in which the household reside	(Amathole=35%,Chris Hani=26%, OR Tambo=15%)=Eastern Cape; (Umkhanyakude=8%; Harry Gwala=6%, Zululand=5%, King Cetshwayo=2%)= KwaZulu Natal; (Vhembe=3%)=Limpopo			
Gender	Female=36%, Male=64%			
Education level of the household	None=11%, Primary=34%, Secondary=27% Matric=12%,Technical college=6%,University =10%			
Ownership of television	Yes=88%, No=12%			

Source: Own calculations

In the study areas, the rangeland condition is generally, perceived to be in bad condition. Combined, the perception “very bad” and “bad” accounts for more than half of the respondents’ responses. These perceptions concur with the innumerable literature on communal rangeland status in South Africa, which have constantly, been rated as in poor condition because of overgrazing mainly due to shortage of grazing land (see e.g. Hoffman and Todd 2000; Palmer and Bennett 2013). However, respondents reasoning of the poor condition is mixed. Almost half of the respondents who think their rangelands were in poor condition believe the reason is insufficient rainfall and very few attributed the condition to shortage of grazing land and fences to allow rotational grazing. These perceptions contradict the scientific reasoning from literature. These disparities

underscore the knowledge gap between farmers and science. The few respondents who rated their rangelands as in good condition attributed such status to good management from the farmers. However, from the authors' observations during the fieldwork, there are few areas where there were camps to allow rotational grazing and there were no signs of rotational grazing practices as all camps were grazed.

Empirical analysis of the factors underlying rangeland status perceptions

In Table 2, results of the empirical model (ordinal logistic regression) are presented and shows that age, education and perceived reasons for rangeland significantly predicts rangeland status of potential emerging farmers. Farmers age decrease with their perception of rangeland status (from very bad to very good), holding other factors constant. Implying that as farmers grow they are wiser to see the rangeland condition, thanks to their farming experience. Farmers with low literacy levels think rangeland status is good, holding other factors constant. Farmers perceived reasons of rangeland status increases with the rangeland status, holding other factors constant. This imply that

Table 2: Factors explaining rangeland perception status of potential emerging farmers

Variable	Odds ratio	Robust std. error	P-value
Household head age in years	0.96	-0.01	0.000
Household income monthly in Rands	1.00	0.00	0.241
Education level of the household	0.73	-0.07	0.004
Perceived reason for the rangeland status	1.52	0.07	0.000
Ownership of television	1.40	0.00	0.310
Total livestock units	1.00	0.00	0.652
Number of observations	306		
Chi-square	84.03		
Prob>Chi-square	0.0000		
Pseudo R-square	0.073		

Source: Own calculations Note: gender, district were dropped because of multi-collinearity

Conclusions and implications

The study sought to shed light on the perceptions of potential emerging farmers' knowledge of their communal rangelands. This a priori knowledge is important for informing the type and intensity of training for land reform beneficiaries to improve productivity performance of emerging farmers on commercial farms. The study found that although potential emerging farmers know their rangeland status, which concur with scientific literature, however, their reasoning of the underlying factors are different to what is reported in scientific literature. Age and education level of the farmer statistically, predict the reasoning of emerging farmers' rangeland status. These findings underscore a knowledge gap from the potential emerging farmers about their knowledge of rangelands since their perceptions do not match the reasoning from scientific literature. This can be attributed to the potential emerging farmers' limited knowledge on grass species, carrying capacity and of the range and rangeland ecology as noted in Tefera and Kwaza (2019) study. Rangeland management training and literacy levels should be provided for land redistribution beneficiaries' prior to taking over commercial farms. Extension officers should also educate smallholders in communal land with basic rangeland management skills.

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