working paper

6th International Conference of the BRICS Initiative for Critical Agrarian Studies

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Addressing land-based livelihood stressors for resilient communities and rural development

Felix Kwabena **DONKOR** and Kevin **MEARNS**

September, 2018

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Published by: BRICS Initiative for Critical Agrarian Studies (BICAS)
in collaboration with:

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Abstract

Natural resources are critical to the livelihoods of vulnerable households and communities with implications for the Leaving No One Behind (LNOB) agenda. Nevertheless, the palpable impact of climate change inter alia has increased competition for such resources and related contestations. Such livelihood stressors affect the success of land-based livelihoods and rural development. This study uses the multi-method approach involving 150 farmers to investigate how uptake of innovation in smallholder farmers affects their dependence on land-based livelihood assets, its relation with natural resource conflicts and the implications for food security. The youth are relatively more dependent on land-based livelihood assets as they are unable to afford alternatives compared to older and wealthier farmers. This accounts for the youth being significantly impacted by natural resource-related conflicts related to competing interests for such resources. Furthermore by their culturally assigned role as livestock herders in the community; the youth may be more affected by livestock straying into other people's farmers which is another source of conflict. Improved communication and negotiation amongst resource user groups will help limit the collision of competing interests which translates into disputes over natural resources. Moreover the effects of demand-induced and supply-induced scarcity is more pronounced in areas with favourable agricultural conditions and has resulted in increased conflicts in those areas. Education facilitates wealth creation and engenders an enhanced safety net for the relatively well educated.

Keywords: innovation, small holder systems, food security, climate impacts

1. Introduction

Natural resources play a critical role in rural livelihoods across the globe and are crucial to the sustenance of vulnerable households and communities (Ward, 2012). However the increasingly palpable effect of climate change is such that these critical resources are becoming scarce with attendant heightened contestation over such. Conflicts over natural resources are contestations and argument access to, and control and use of natural endowments. Such contestations arise result different stakeholders have competing interests for resources such as rangelands, water, grazing fields and land, or want to use them in opposite ways (FAO 2000). Discord also result associated interests and needs are incompatible, or when some user groups are not marginalised in policies, programmes and projects. Such conflicts of interest are an inevitable feature of all societies. In contemporary times, the scope and magnitude of natural resource conflicts have escalated (King & Veit, 2013). These conflicts, when not dealt with can cascade into violence, because environmental degradation, disrupt projects and undermine livelihoods (Bromley, 2015). Acknowledging that conflict is a common feature of any resource use system is a prerequisite for sustainable management that is participatory and equitable.

Natural resources conflicts are ubiquitous and include diverse actors. They may encompass conflicts among local men and women vis a vis the utility of trees, to discord between neighbouring communities contesting over rangelands, to villages, community-based organizations, local and international firms, multinational development agencies and NGOs in disagreement per the use and management of natural areas (King & Veit, 2013). Most conflicts are characterized by the presence of multiple stakeholders who themselves may have subgroups with varying interests

There is a dearth of research on the connection between environmental resource use particularly land-based livelihood assets and poverty dynamics particularly among indigenous communities. This study, therefore, contributes to knowledge on this topic by investigating how natural resources related conflicts are conditioned by a number of individual and household factors.

Study Site: Mpakeni

Mpakeni village is in the Mpumalanga Province in north-eastern South Africa. The predominant populations in the area are of siSwati (Swazi) and xiTsonga (Tsonga) origins and located on the southern border of the Kruger National Park (Van Riet et al. 1997). The tributaries of the Makhomane, Luphusi and Nsikazi rivers drain the area and act as water sources (Hampson et al. 2001). The soils are characteristic of sandy loam soils interspersed with granite outcrops (Hampson et al. 2001). The prevalent flora has attributes of the sour lowveld bushveld or Malelane mountain bushveld whilst part of the area is categorised as a vulnerable vegetation type -- *Croc Gorge Granite Mountainlands* (SANBI 2007). A total of one hundred and fifty (150) farmers were interviewed from across Mpakeni.

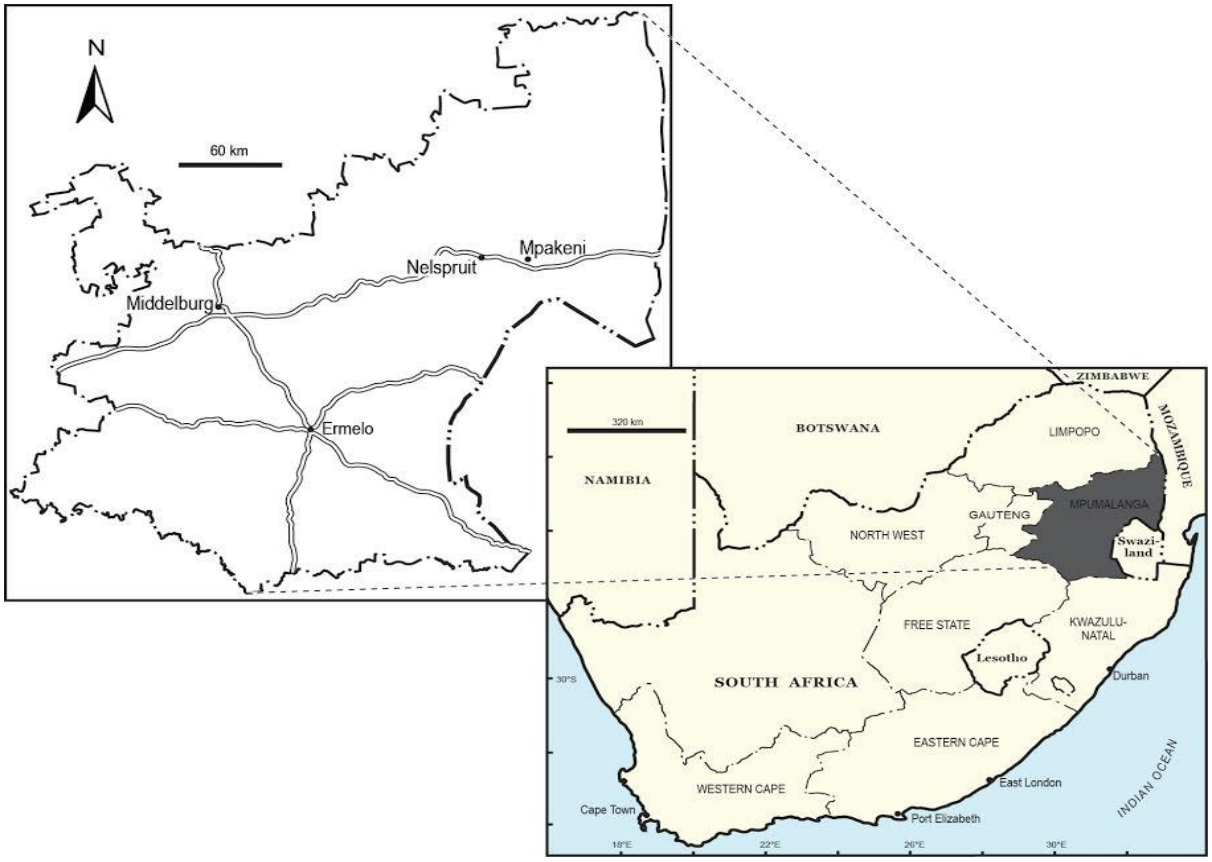

Fig. 1 is a view of the study site (Mpakeni) its relative position in the province (Mpumalanga) and South Africa.

2.0 Research Methodology

Data was gathered between March/April 2016 using household interviews and rapid rural appraisal (RRA) techniques. The data comprised of biographical information, and engagement in land-based livelihood activities. How many groups of people were involved (households, farmers, local government authorities)

For the interviews, 150 farmers were randomly selected from the four village sub-sections which compose Mpakeni village (Fig. 3). The questions were generated following in-depth literature studies and discussions. What was the purpose of the questionnaires? How?

Data Analysis (include this to the one above)

The study premised on the mixed method approach as it couples qualitative and quantitative approaches. One hundred and fifty small holder farmers were interviewed on their involvement in land-based livelihood activities and ownership of related resources. The chi-square test was used to examine significant differences in incidences of conflict along key traits such as *gender, age, educational level* and *area of respondent.* Furthermore, a multivariate logistic regression model was used to afford a more robust assessment of the influence of the multiple variables after simultaneously controlling for the impact of other factors which the chi squared does not.

Results

Age has a significant affects the incidence of natural resource/farming related disputes (Table 1).

Table 1. Association between respondents' age and the incidence of farming-related disputes

Dispute	Yes	No	Total
	Percentage (frequency)		
18-34	11.63 (10)	23.44 (15)	16.67 (25)
35-54	26.74 (23)	50 (32)	36.67 (55)
55-74	45.35 (39)	18.75 (12)	34 (51)
75+	16.28 (14)	7.81 (5)	12. 67 (19)
Total	100 (86)	100 (64)	100 (150)

$\chi^2 = 18.1947$, $p = 0.000$

Incidence of natural resource disputes varied between localities (Table 2).

Table 2. Spatial patterns have a significant relationship with incidence of disputes

Respondent's locality	Yes	No	Total
	Percentage (frequency)		
Mambayin	53.49 (46)	35.94 (23)	46 (69)
Manjesa	23.26 (20)	25 (16)	24 (36)
Magamzin	2.33 (2)	18.75 (12)	9.33 (14)
Gagani	20.93 (18)	20.31 (13)	20.67 (31)
Total	100 (86)	100 (64)	100 (150)

χ^2= 13.1159 , p= 0.004

The incidence of natural resource/farming related disputes was not affected by respondent's gender (Table 1).

Table 3. Relationship between gender incidence of farming disputes

Dispute	Yes	No	Total
	Frequency (percentage)		
Male	46.51 (40)	53.13 (34)	49.33 (74)
Female	53.49 (46)	46.88 (30)	50.67 (76)

Total	100 (86)	100 (64)	100 (150)

$\chi^2 = 0.6421$, $p = 0.423$

The educational level of respondents did not influence the incidence of natural resource related disputes (Table 2).

Table 4. Association between educational levels of respondents and incidence of farming related disputes is not associated with education level

Education level	**Yes** Frequency (Percentage)	**No**	**Total**
No education	32.56 (28)	15.63 (10)	25.33 (38)
Grade 1-4+ vocational	33.72 (29)	46.88 (30)	39.33 (59)
Grade 5-10	22.09 (19)	25 (16)	23.33 (35)
Matric+ degree	11.63 (10)	12.5 (8)	12 (18)
Total	100 (86)	100 (64)	100 (150)

$\chi^2 = 5.9234$, $p = 0.115$

The incidence of disputes is not associated with having several cultivated fields (Table 3).

Table 5. Relationship between incidences of disputes and field numbers

Dispute & number of fields	Number of cultivated fields Percentage (frequency) 1--4	5--10	11+	Total
Yes	50.91 (28)	57.14 (20)	75 (6)	55.1 (54)
No	49.09 (27)	42.86 (15)	25 (2)	44.9 (44)
Total	100 (55)	100 (35)	100 (8)	100 (98)

$\chi^2 = 1.7301$, $p = 0.421$

Table 9. Age and spatial patterns have significant effect on incidence of disputes

Disputes	Odds Ratio	P-value	Standard error	[95% C. I]
Age Group				
18-34	0.02	0.01	0.032	0.0014-0.355
35-54	0.04	0.00	0.047	0.004-0.377
55-74	Ref	Ref	Ref	Ref
75+	5.95	0.28	9.717	0.242-146.1
Gender				
Male	Ref	Ref	Ref	Ref
Female	1.21	0.79	0.841	0.308-4.72
Educational Level				
No Education	Ref	Ref	Ref	Ref

Vocational or Grd1-4	0.24	0.14	0.235	0.037-1.603
Grade 5-10	3.90	0.27	4.779	0.351-43.1
Degree or Matric	5.58	0.24	8.096	0.325-95.8
Zone				
Mambayin	Ref	Ref	Ref	Ref
Manjesa	0.20	0.02	0.136	0.052-0.76
Magamzin	0.01	0.03	0.021	0.00014-0.698
Gagani	0.57	0.54	0.523	0.093-3.45
Cultivated farm fields				
1 - 4	Ref	Ref	Ref	Ref
5 - 10	0.92	0.91	0.646	0.234-3.638
11+	1.24	0.84	1.282	0.1621-9.43

Discussion

Disputes over natural resources-like land, crop/livestock-are universal (Brown & Keating 2015). Such disagreements can also trigger violence and destruction, especially in the absence of robust institutions or appropriate remedial measures like is often the case in the rural South (Brown & Keating 2015). Although there exists institutions for managing comunal resources in the former lands such as the study site (Fig. 1); these institutions often lament a general disregard for laws in the post-apartheid era.

Less well-off farmers and those with smaller herds, tend to make more use of various goods and services provided by livestock unlike wealthier farmers (Shackleton et al. 2001). The youth are often at the beginning of their livelihoods and lack sufficient capital which older ones have built over the years to support their agriculture. Wealthier farmers rather obtain more alternatives (eg tractor draught, pasteurised milk), which poorer ones are unable to afford (Shackleton et al. 2001). This may also account for the youth being significantly impacted by natural resources disputes (Table 1) as they cannot afford the alternatives and be comparatively more reliant on livestock services.

Moreover conflicts such as between pastoralist/livestock herders over the destruction of farms can become violent flashpoints for wider communal discord (Brown & Keating 2015). This may potentially come with other negative unintended consequences like disruption of agriculture and related infrastructure. However, when amicably resolved, they are vital ingredients for social

progress and development (Brown & Keating 2015). Majority of the livestock herders observed in the course of the study were in the youth bracket. They did not necessarily own the livestock but herd them on behalf of elderly people. In the course of the study, it was observed that livestock straying into people's farms and damaging crops was one common source of conflict. This was also a common narrative amongst aggrieved farmers. This may also account for age having a significant impact (Tables 1, 4 & 10) on disputes.

Natural resources are inherently neutral to the incidence of disputes, however it is the nature of their scarcity and their importance to particular interests that leads to contestations (Ayling & Kelly 1997). Furthermore it is argued that disputes are purely management 'problems' (Burton & Dukes 1990) and commonly solved through communication and exchange of information (Ayling & Kelly 1997). This suggests there is a clash of interests in the manner of use by the different age groups/areas (Tables 1, 2, 3, 4 & 6) which necessitates enhanced communication to manage volatile conflict of interest.

Demand- induced scarcity are caused by population pressures or increased per capita use; supply-induced scarcity are due to the resource being dimished at a quicker rate than it is restored. These two conditions are intricately intertwined (Ayling & Kelly 1997). The former homelands have been described as some of the most degraded areas in South Africa, this may have influenced the incidence of disputes; less arable land and resouce scarcity has resulted in more disputes amongst the youth as they are relatively more affected. Because the youth do most of the livestock herding, the lack of grazing lands may have caused them being more prone to their livestock straying to other farmers's crop field especailly in the Magamzim zone (Tables 1 & 6). This also calls for improved production methods (Table 4) to produce more with less resources, limit competition for resources and reduce the probability of natural resources disputes.

Structural scarcity is caused by socio-cultural factors and is attributed to maldistribution of resources; ownership is skewed in the hands of a few elite whiles the majority of the populace is disadvantaged. Although there is a mutual interraction between these two forms of scarcity which operate in tandem (Homer-Dixon 1994; Ayling & Kelly 1997), the primary nature of scarcity is critical in influencing the dynamics of a given conflict. In situations where scarcity is attributed to structural imbalance instead of absolute shortage, there is a higher likelihood of conflict (Ayling & Kelly 1997). The youth may be bearing the brunt of such maldistribution (Table 1) as decision making is often associated with seniority.

The kind of resource of contention is also a vital factor- whether they are core or marginal to the conflict and their socio-economic value (Ayling & Kelly 1997). Hence some resources are of comparatively higher socio-economic improtance than others. For example shortage of water has more apparent impacts on survival and more disputable than ozone depletion. Therefore in situations where contest for access is immediate, like over land resources such as water or forest resources, the likelihood of conflict is higher (Ayling & Kelly 1997). For the study area, management of the Mthethomusha game reserve argued most poachers fall in the youth bracket.

This points to the youth taking such desperate measures to survive due to lack of alternative forms of employment.

Contextual factors; the significance of the contested resource to parties in a conflict is also attributed to ecosystem vulnerability. For eample disputes over water resources in the Northern Hemisphere in a context of relative abundance might assume a different trajectory from that of semi-arid climates such as in southern Africa or the Middle East (Ayling & Kelly 1997). In the study area, zone Magamzin is descrided as a relatively fertile area for agricultural activities compared to other areas in Mpakeni. This may have led to more agriculture related activities taking place in that area or being given more premium with the attendant significant incidence of disputes in this area (Tables 2 & 6).

Conclusion

Natural resources are an important source of household direct provisioning and, together with land, are vital to the livelihoods of many millions of people. Conflicts over such resources are a threat to communal harmony and sustainable development (Brown & Keating 2015). Population growth, climate change, environmental degradation, all mediate resource use at the local level. The youth are generally burgeoning in their livelihoods and lack the requisite capital to employ various goods and services provided by livestock unlike wealthier farmers; this accentuates their dependence on land-based livelihood assets and related conflicts. Moreover the youth are relatively more physically fit for herding livestock; and hence are often employed to herd them on behalf of others. This may also account for age having a significant impact on disputes. Improved communication amongst user groups will help limit the collision of competing interests which translates into conflicts. Moreover the effects of demand-induced and supply-induced scarcity is affecting more of the people in Magamzin zone and the youth. Respondents from Magamzim and Gagani are more reliant on land-based livelihood assets as a safety net or as a household strategy given that those areas are more conducive to agriculture.

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Felix Kwabena Donkor is a PhD candidate in environmental sciences at the University of Witwatersrand, South Africa. He is also a research associate with the School College of Agriculture and Environmental Sciences, University of South Africa (UNISA). Felix is a product of the ERASMUS-MUNDUS Joint European Masters in Environmental Sciences (JEMES), jointly run by Techniche Universitat Hamburg (Germany), University of Aalborg (Denmark), Aveiro University (Portugal) and Universite Autonomia Barcelona (Spain). His current research addresses how local institutions can serve as agents of sustainable management of communal resources at the grassroots level with the former homelands of South Africa as a case study. The thematic areas of climate change, environmental governance, resilient livelihoods, education and sustainable development are of interest to him. He is also a social/economic entrepreneur who loves volunteering. His hobbies include writing, swimming, cycling, and drumming.

Kevin Mearns is a University of South Africa, Environmental Sciences Department, and Faculty Member. He lectures in Sustainable Tourism, Studies Research Methodology, and environmental management .His research aims to maximise community benefits from tourism through community-based tourism ventures that are sustainable in the long term.


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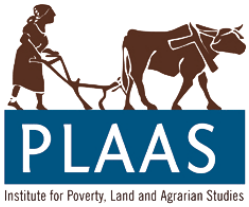
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