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Pastoralist Use of Reseeded Fields for Additional Resilience to Climate Variability through Alternate Livelihood Activities

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Key words: Kenya, Baringo County, dry season grazing, arid lands, land degradation.

Abstract

Land degradation, climate variability, socio-economic changes and population increase are some of the factors that shrink grazing lands making forage availability less predictable and affecting the resilience of pastoralists communities. Reseeding as an intervention can rehabilitate degraded lands for profitable use through offering pastoralists alternative sources of livelihood and encourage livelihood diversification. This study evaluated two pastoral communities, the Tugen and the Njemps from Baringo County, Kenya, who have owned, managed and used reseeded fields to study the dynamics of reseeded land. A total of 193 pastoralist households were interviewed. These two pastoral communities used their fields for: dry season grazing, grass seed harvesting, cutting thatching grass, milking of mostly cattle, engaging in fattening programs, bailing of hay, and leasing of land. On average, each household engaged in two to three activities with a maximum of five activities combined. The most common activity was dry season grazing which is practiced by 82% of the respondents followed by grass seed harvesting. These activities can be performed in sequence but proper planning is required to ensure that the field remains sustainably productive and successful. Reseeding appears to have high potential for implementation in other dry land counties of Kenya and Sub-Saharan Africa as an intervention that can improve resilience to climate variability as it provides additional grazing ground for the livestock.

Introduction

Over 600 million people, majority of whom are pastoralists depend on rangelands which make up 41% of the world's land and 43% of the land in Africa, for their livelihoods (Durrell, 2018). Pastoralism is a livestock rearing system where pastoralists move with their herds in search of pasture and water. This mobility aspect allows animals to efficiently convert limited ecological resources into human sustenance but due to the scarcity of resources, can also result in conflicts locally, regionally, and nationally as people and animals cross jurisdictional boundaries. Pastoralists have been under administrative pressure to reduce their mobility and adopt a more sedentary lifestyle (Kimiti et al., 2018). Other pressures that have similarly impacted pastoralists include socio-economic changes, population increase and climate variability including frequent and prolonged droughts which shrink grazing lands and make forage availability less predictable (Elhadi et al., 2012). Initiatives that guarantee pastoralists' right to mobility and investments that allocate dry season grazing rights on common use rangelands have the potential to secure pastoral lifestyle and significantly protect rangelands from degradation (Anderson and Bollig, 2016). Reseeding is such an intervention, especially if the rehabilitated land is put to profitable use.

This paper researches the dynamics of reseeded land as an intervention among pastoral communities. It uses the Tugen and Njemps pastoral communities who are beneficiaries of reseeded as an intervention that restores severely degraded rangelands to address food insecurity, poverty and other livelihood problems (Meyerhoff et al., 2020). The Tugen are a sub-tribe of the larger Kalenjin people who are the fourth largest ethnic group in Kenya, with a population of approximately 200,000 people. The Maa-speaking Njemps in Kenya live in the south and southeast side of Lake Baringo and their population is about 35,000 people. They are among the tribes considered as minority groups in Kenya due to their small population numbers nationally (Kenya National Bureau of Statistics, 2019). The Kalenjin and, by extension, the Tugen, have for generations practiced a mixed economy that included herding livestock, while the Njemps culture underwent transformations from fishing to sophisticated systems of irrigation, that were mixed with pastoralism as influenced by the neighbouring Samburu and Maasai. The main objective of the study is to evaluate household alternate field use characteristics.

Methods and Study Site

The study was conducted in Baringo County in the Rift Valley region of Kenya. Baringo covers an area of 11,015 square kilometres, which encompasses Lake Baringo at about 165 square kilometres. The population of the area is about 667,000 people (KNBS, 2019). This study focuses on the lowlands, which are areas in the Arid and Semi-Arid Lands (ASALs) climatic zones, covering a major part of the county with average rainfall of 400- 600 mm per annum and temperature ranging from 10°C to 35°C (Kiage et al., 2007;). Baringo County is one of the five most rural counties in Kenya and over 50% of its population live below the poverty line (Odada et al., 2006).

The target population was about 500 field owners who own and manage more than 900 reseeded fields that were rehabilitated by the Rehabilitation of Arid Environments (RAE) Trust/LTD. The field owners selected for household visits were randomly but equally selected between the two tribes: the Tugen and the Njemps. A total of 193 households were visited and data was collected through the administration of a survey in June 2019. Some of the targeted field owners were not available because they had permanently relocated, or they had migrated in search of pasture because at the time of the data collection, these communities were recovering from a prolonged drought and its associated challenges. Some of the fields that were intended for the survey were also no longer in use because they had been submerged by the flooding of Lake Baringo, or their owners had abandoned them because of insecurity following tribal clashes over land and pasture resources. Some fields were also newly reseeded and had not yet been used for any income generation yet. As a result, of the 193 households that were visited, only 98 were used for the analysis.

Results

Tradable outputs obtained from the reseeded fields included: dry season grazing, grass seed harvesting, cutting thatching grass, milking, engaging in fattening programs, bailing of hay, and leasing of land. The two tribal communities differed in their participation in the income generating activities (Table 1). The participation of the Tugen and the Njemps is at varying frequencies for all the different income generating activities. For instance, cutting thatching grass is more common among the Tugen than the Njemps: 40% of the Tugen participate in cutting thatch as compared to 12.5% of the Njemps. Similarly, engaging in fattening programs is more common among the Njemps than the Tugen: over 50% of the Njemps participate in fattening programs compared to 6% by the Tugen (Table 1). None of the households surveyed engaged in all seven of the activities. On average, they engaged in two to three activities with a maximum of five combined activities. The most common activity was dry season grazing and grass seed harvesting. A total of 82% reseeded field owners used fields for dry season grazing. Further, if a field owner engaged in just one activity, the activity was most likely dry season grazing. For the other activities, 78% engage in grass seed harvesting, 29% cutting thatching grass, 9% milking livestock, 32% cattle fattening programs, 21% cutting and bailing grass, and 18% leasing land. These income generating activities could also be pursued at different times of the year, providing the households with an opportunity for income for most parts of the year. These activities can be sequential uses of the land and proper management and planning is required to ensure that the fields still remain sustainably successful. For example, grazing the field before grass seed harvesting would have meant that you could not obtain the benefit from grass seed harvesting while grazing afterward maintains the value of both.

Table 1

Income generating activity	Njemps (n=48)		Tugen (n=50)	
	Frequency	Percent	Frequency	Percent
Dry season grazing	41	85	34	68
Grass seed harvesting	40	83	31	62
Thatching grass	6	12.5	20	40
Milking	6	12.5	2	4
Fattening program	26	54	3	6
Bailing of hay	8	16.67	11	22
Leasing of land	9	18.75	7	14

Discussion [Conclusions/Implications]

On average households engaged in two to three activities, but a total of seven diverse income generating activities associated with utilizing reseeded fields. The biggest incentive for reseeding fields appeared to be dry season grazing, grass seed harvesting and the other tradable outputs they obtain from successfully reseeded fields (Mureithi et al., 2016). The high success of the reseeding exercise (93% among the Tugen and the Njemps) meant that the pastoralists who invested in reseeding as a source of livelihood, had higher chances of incomes from their investment and ultimately reduced their vulnerability to uncertainties. Though reseeding and its associated benefits may not be entirely climate-proof, indigenous grasses like *Cenchrus ciliaris* and *Eragrostis superba* have proven to be more viable and productive than most agricultural crops (Mganga et al., 2015) and they do not require pastoralists to change their livestock-based culture which has been practiced for many generations. Additionally, the different activities could be engaged in during different seasons, and with proper planning and sustainable management, the pastoralists could have incomes for most parts of the year.

Policy reforms that guarantee pastoralists' right to mobility and initiatives that allocate dry season grazing rights on common use rangelands have the potential to secure pastoral lifestyle and significantly protect rangelands from degradation (Anderson & Bollig, 2016). However, the bureaucracies involved and weak enforcement mechanisms likely constrain such reforms from being sustainable (Fischer et al., 2020).

Reseeding and its associated benefits address pastoralists vulnerabilities without requiring them to shift from their culture making it more desirable. The environmental and socio-economic benefits from reseeded have the potential to improve pastoralists livelihoods making them more food secure, prosperous and resilient. Future policies and institutions that support reseeded on communal lands, private enclosures, or open ranges may expand these benefits if sustainably managed. Potential avenues for further research include the opportunity of reseeded the open and vast rangelands of Kenya and Sub Saharan Africa, and understanding the changing culture of pastoralism in the dawn of contemporary challenges such as the COVID-19 pandemic.

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