

Transhumance, Tree Growing and Ecosystem Resilience



Summary

For centuries, communities in the Sahel have practiced transhumance as a coping strategy for feed and water shortages for livestock. This practice, however, is creating social, ecological and resource stress, as it is seasonally increasing the livestock footprint in landscapes already struggling with resource scarcity. It has also become a major challenge for on-farm tree growing and agricultural restoration. The large numbers of transient livestock is becoming a major concern for community forest restoration, as the animals feed on and trample planted young seedlings and saplings, hence slowing restoration. The problem encompasses both cross-border and domestic transhumance. Cross-border transhumant communities cut down trees, often resulting in conflict with local communities, who are responsible for the forest and community-managed parks.

As ecosystem restoration becomes central to addressing climate change and the generation of ecosystem goods and services, it is crucial that proper policies and strategies are set out to address the damage such practices cause to restoration activities. There is a need for regional consensus and guidelines on managing the large numbers of livestock involved in transhumance. There is also a need for a cross-sectoral approach to transhumance as it is seen as an adaptation strategy in some sectors and an environmentally damaging practice by others.

Key Messages

1. Transhumance is a dominant indigenous livestock management system in sub-Saharan Africa, serving as an adaptation strategy to climate change and variability.
2. Two streams of transhumant practices exist (cross-border and domestic) in impacted regions of The Gambia, affecting at least 1,400 ha of forests and vast areas of agricultural land.
3. Cross-border transhumance occurs during periods of serious scarcity of forage and is predominant in areas adjacent to the border with Senegal, mainly from January to June, while domestic transhumance happens throughout the year but with lower livestock numbers.
4. Key transhumance impacts on the environment include destruction of trees, overgrazing and soil erosion, while livelihood impacts include livestock theft, community conflicts and disease transmission.
5. Proposed solutions for domestic transhumance include national policy and institutional frameworks to regulate livestock movement, as well as regional and bilateral agreements and protocols for cross-border transhumance control.
6. A cross-sectoral road map to managing domestic transhumance is crucial.

Policy implications

1. Ongoing cross-border and domestic transhumance activities have become a challenge for tree-based ecosystem restoration in The Gambia as livestock trample and destroy new seedlings and samplings. A concerted response by agencies responsible for livestock management in the region is required to engage in dialogue and find amicable solutions to managing this key traditional adaptation practice along with tree-based ecosystem restoration.
2. The transhumant practices have also escalated the costs of tree-based ecosystem restoration, as every seedling planted needs protection using either tree guards or fences.
3. The combined effects of domestic and cross-border transhumance often affect the regeneration process both in farms and in forests. This means that The Gambia will not be able to meet its restoration targets in the foreseeable future.
4. There is a strong need to revisit the current practice of transhumance to make it less environmentally damaging and to explore a more efficient and productive way of livestock management, especially where ecosystem degradation is occurring.
5. There is a need for a regional approach to awareness-creation regarding the adverse effects of cross-border transhumance so that the transhumant communities understand the implications of their practice and comply with existing grazing routes and protocols in the country.

Transhumance as a traditional adaptation practice

Transhumance, a seasonal migration of livestock and humans, is a traditional livestock production system commonly practiced in sub-Saharan Africa. It involves the movement of pastoralists and their livestock to cope with local environmental constraints and variability to exploit seasonal availability of pasture and water resources (Daniel 2002; Pamo, 2008). Recurrent scarcity of forage and water in certain parts of Senegal and The Gambia, especially in the dry season, has triggered increased livestock movement by transhumant herders, often resulting in conflicts and growing competition over natural resources. It is characterized by seasonal and cyclical mobility of livestock (SWAC/OECD 2007), typically to corridors which offer free grazing opportunities. This ancient custom has been observed for centuries.

Transhumance represents a key adaptation strategy to climate and environmental changes and can potentially impact societies and ecosystems that they depend on for survival (Aryal et al. 2018). Despite the perception that transhumance plays an essential role in maintaining the ecological resilience of dryland ecosystems and in promoting livestock productivity (Ayantunde et al. 2014), the practice is facing increasing challenges in the context of demographic

pressure, often leading to frequent conflicts and competition over resources between farmers and pastoralists (Dugué et al. 2004; Benjaminsen and Ba 2009; Weber and Horst 2011). Many local communities believe that transhumant practices involving abusive cutting of trees and overgrazing can significantly derail community-based natural resource management efforts (Ayantunde et al. 2014), which may consequently contribute to degradation of scarce resources (Tonah 2006).

The Gambia's National Development Plan (2018–2021) has stressed the need to sustainably manage the environment and natural resources to increase resilience to climate change for the benefit of all. According to the plan, the interventions will focus on strengthening environmental and climate change policies, programs, and awareness at all levels, including sustainable management of natural resources and adoption of appropriate land-use approaches. Human-driven actions have heightened threats to fragile natural resources. For instance, the uncontrolled exploitation of trees and grasses by transhumance herders in the forest and farmland ecosystems of The Gambia seems to endanger the supply of the ecosystem services that underpin the livelihoods of hundreds of thousands of rural communities.

The Gambia is highly vulnerable to climate change, the effects of which have already taken their toll on the natural resource base and the lives and livelihoods of local communities. The 'Large-Scale Ecosystem-Based Adaptation in the Gambia: Developing a Climate-Resilient, Natural Resource-Based Economy' project was launched in 2017 funded by the Green Climate Fund through the United Nations Environment Programme, in partnership with the Gambian Ministry of Environment, Climate Change and Natural Resources. The overarching goal of the project is to build a climate-resilient natural resource base for communities across three intervention regions of The Gambia – Lower River Region, Upper River Region and Central River Region. Ecological restoration of degraded forests and agricultural landscapes with climate-resilient species is one of the key priority areas of the project, which can potentially generate tangible benefits for climate-change adaptation. However, these efforts are being derailed by several human-driven factors, including transhumance.

Transhumance is key to communities in the project intervention area in the northern parts of Central River Region and Upper River Region, which are either transit or destination points for the transhumant herders from Walo in Senegal or parts of northern Upper River Region. In addressing transhumance issues, an empirical study was conducted to quantify the impact of transhumant practices on the forest resources of host communities in The Gambia. The research attempts to characterize transhumance in The Gambia and assess its impacts on and benefits to communities and ecosystems at large.

Approach

This study was carried out in two regions – Central River Region and Upper River Region – in The Gambia (Figure 1)

characterized by a mono-modal rainfall pattern with a short rainy season from mid-June to early October. The climate is typically Sudano-Sahelian, with average annual precipitation ranging from 1,000 mm in the south and southeast to 700 mm in the northern part of the country (Government of The Gambia 2020). The two regions are important target areas for transhumant activities in the Large-scale Ecosystem-based Adaptation project.

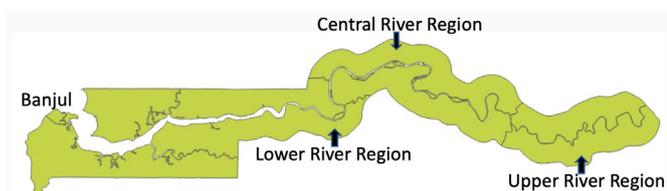


Figure 1. Project regions for the Large-scale Ecosystem-based Adaptation in the Gambia: Developing a Climate-Resilient, Natural Resource-Based Economy

Quantitative and qualitative design approaches were adopted for the data collection using in-depth interviews and focus group discussions. Data was collected in 20 communities from relevant stakeholders in seven districts affected by transhumance practices. The community forests covered in the study totaled 1,407 ha. For each study area along the transhumance routes, the community forest committee chairperson, village head and a community forest committee member and/or a local herder were interviewed using semi-structured questionnaires on demography, transhumance systems and seasonality, animals involved, migratory routes and trends, drivers, constraints and opportunities, and regulatory mechanisms. Forestry officers, chiefs and Department of Livestock Services officials were also consulted. The focus group discussions entailed assessing how transhumant practices affect natural resource management in the host communities. The collected data was analysed using basic descriptive statistics such as percentages, means and standard deviations. The rest of the collected data was analysed using context analysis.

Findings

Transhumance practices in The Gambia

The communities in the study areas are composed of diverse ethnic groups, who historically have been engaged in crop farming and animal husbandry as their principal livelihood strategy. Transhumance practices in The Gambia are an integral part of the traditional livestock production system as a coping strategy to deal with shortage of pasture and water in certain periods of the year. Transhumance involves cattle, sheep and goats. Livestock production plays a significant role in The Gambia's Gross Domestic Product and in meeting the demand for meat, milk, power and manure.

The survey revealed that cross-border and domestic transhumance are the two predominant practices that exist in the surveyed communities. Domestic transhumance typically involves seasonal movement of pastoralists and their cattle to the wetlands of Niamina East and West in south Central River Region in search of pasture and water during the dry

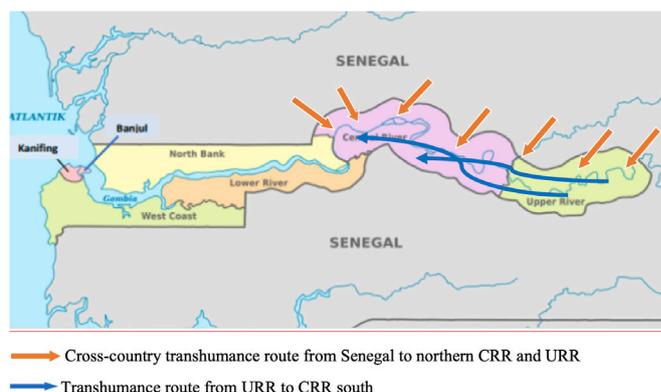


Figure 2. Indicative active transhumance directions in The Gambia

season, while cross-border transhumance entails the cyclical movement of cattle and small ruminants (sheep and goats) from the Walo region of Senegal into villages in north Central River Region and Upper River Region. In general, most of the communities in north Central River Region are either destination points or transit zones for transhumant herders from the Walo region. The proximity and low-lying nature of Niamina East District makes it an ideal location for availability of pasture resources, especially during the dry season when forages and surface water elsewhere are scarce.

Transhumance practices usually extend from October/November to May/June of the following year (Figure 3). The most active periods for cross-border transhumance occur between February and June (80%), while 40% of domestic transhumance occurs from March to June. The duration of stay in the host communities by transhumant herders ranges from one day to a couple of months. This is largely dictated by the availability of pasture and water in the host communities. Based on observations during the past decades, the respondents reported that the trend of the practice is increasing. The practice ends at the onset of the rainy season, when water and pasture resources become available.

Transhumance is a key adaptation strategy and is meant to overcome the constraints related to harsh environmental conditions and ecological resource scarcity during the dry season (Bronsvort et al. 2003; Kelly et al. 2016). During this period, a large proportion of livestock herds temporarily migrate to more favourable ecological and environmental areas. The transhumant herders, arriving or in transit, are usually hosted by indigenous communities. The livestock are the mainstay of the herders' subsistence economy, contributing to income and household food security. The perceived economic and trade relationships that often exist between the herders and members of host communities are quite weak in the study area. Livestock products, mainly milk, are produced and sold to individuals in the host community.

The number of animals involved in the transhumance processes were estimated. The cross-border transhumance involved significantly large numbers of cattle and sheep (Figure 4).

The perceived levels of transhumance are high for both cross-border (67%) and domestic (65%) practices (Figure 3), which sometimes triggers conflicts between the pastoralists

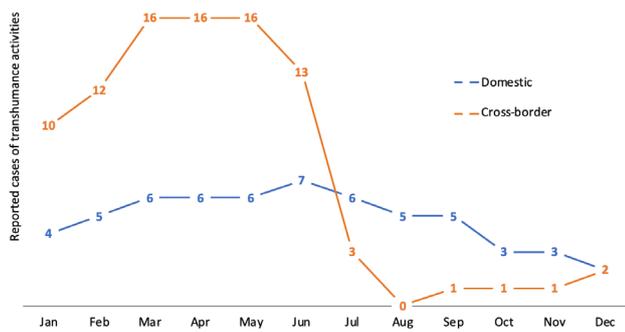


Figure 3. Indicative active transhumance periods in The Gambia

and members of community forest user groups. For example, there are repeated complaints lodged by local community members against cross-border herders over livestock theft, particularly during transit periods. Furthermore, the fact that pastoralists usually do not follow specific routes/tracks during grazing or transit, coupled with the unauthorized cutting of tree branches by the transhumant herders, is a potential source of conflict. In the West African Sahel zone, conflicts between farmers and transhumant herders have been reported (Moritz 2010).

Impact of transhumance on ecosystems and communities

Communities rely on forest resources for their livelihoods. Such resources provide a range of economic, environmental and cultural benefits that these landscapes yield. Therefore, implementation of sustainable natural resource management approaches is key in maintaining ecosystem services. The presence of large herds of livestock in the host communities seems to have a longer lasting effect on the soil physio-chemical properties. Detailed ground-truthing at the camping sites used by transhumant pastoralists revealed interesting findings. In the evening, the herds are congregated or penned in the host communities' fields, mostly in farmland, so

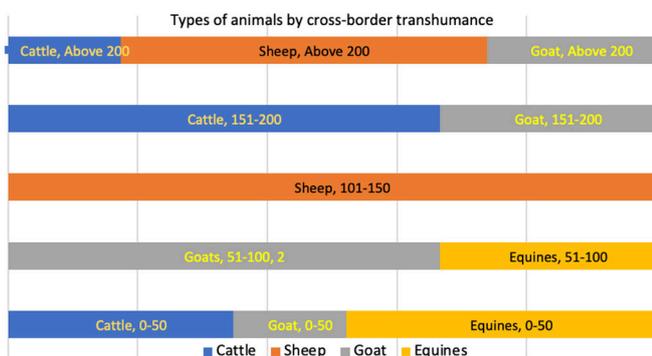


Figure 4. Cross-border transhumance and livestock involved

contributing manure as fertilizer, which is essential for crop production. In some instances, the soil appears to be over fertilized. Furthermore, the soil is also exposed to compaction due to livestock trampling, which may restrict pasture growth. Most communities argued that the dense compacted soil

caused by livestock trampling tends to change the physical condition of their soil, eventually restricting water infiltration.

Table 1. Perceived impact of transhumance on environment and livelihoods

Effect of transhumance	Parameters	Transhumance practices	
		Domestic (% of respondents)	Cross-border (% of respondents)
On the environment	Competition for water	21	18
	Soil erosion	33	20
	Tree cutting	4	36
	Overgrazing	33	25
	Bushfires	8	0.00
	Total	100 (n=24)	100 (n=55)
On livelihoods	Disease transmission	33	32
	Cross-breed fertilization	27	19
	Livestock theft	13	34
	Conflicts	27	15
	Total	100 (n=15)	100 (n=47)

Transhumance remains very crucial to the livelihood of host communities, both socio-economically and ecologically. The herders are mainly active between the months of January and June (Figure 2), as this period shows massive arrival, particularly in north Central River Region, with animals such as cattle, sheep, goats and donkeys.

Generally, the increased incidence of uncontrolled bushfires during the dry season is a key challenge to natural resource management in the Large-scale Ecosystem-based Adaptation project intervention sites. However, one of the key findings of this study is that transhumant practices did not seem to have a noticeable effect on the incidence of bushfires. Similar findings were recently reported by Umutoni and Ayantunde (2018) in southern Mali.

In addition, community members believed that the presence of transhumance livestock can contribute to the introduction and spread of exotic animal diseases. Increased movements and mixing of livestock during transhumance are common risks factors for the spread of several diseases in sub-Saharan Africa (Macpherson 1995).

Most respondents had a clear understanding of the potential effects of transhumant practices on their environment and livelihoods (Table 1). Activities that are detrimental to the environment include tree cutting, competition for water, overgrazing, soil erosion and bushfires. People's livelihoods are also impacted due to incidences of disease transmission, cross-breeding of transhumant livestock with local livestock, theft and conflicts. In the study areas, most of the respondents linked the increased incidence of abusive tree cutting to the presence of cross-border herders (36% of respondents) in their community forests and farmlands to feed their huge numbers of sheep and cattle. The cutting of tree branches is believed to be the major factor linked to ecosystem degradation by transhumant herders. Cross-border herders are known to recklessly lop tree branches in the community forests and farmlands, often leading to conflicts with the host communities (Figure 4). Nearly all



Photo by Alagie Bah/ICRAF

respondents believe abusive cutting of trees has increased in their communities in the past couple of years due to the presence of cross-border transhumant herders.

Illegal tree cutting is rampant in the community forests during transhumance periods. The most common species affected are *Sterculia setigera*, *Bombax costatum*, *Lannea acida*, *Acacia spp*, *Khaya senegalensis* and *Cordyla pinata*, which all have important priority use by the community (Table 2). An assessment of three community forests showed that cutting of *Acacia seyal* and *Khaya senegalensis*, averaged 44 and 33 trees per ha, respectively (Figure 6). *Acacia* is a nitrogen fixer that can thrive in a diverse range of environments and provides valuable fodder for livestock. If left unchecked, the high degree of tree cutting coupled with little regeneration may eventually lead to extinction of these valuable species.

Khaya senegalensis is already on the IUCN red list of threatened species.

Transhumance as a physiological stress for plants

As a result of transhumance, trees are often exposed to different types of pressure resulting from the way they are cut and used. The type of exploitation varies with the location of the tree cutting. In the forest areas, herders often practice whole-tree cutting, especially if they find it very likely to provide more feed for their herds. They also cut any part of the tree they think is fit for their purpose and do not restrict choice of species to cut. Most of these practices happen illegally or through hidden arrangements. On farms, however, the story is a little different. The cutting happens either with

*Ficus capensis**Acacia sieberiana**Khaya senegalensis*

Figure 5. Abusive cutting of tree branches in an already open community forest and farmland

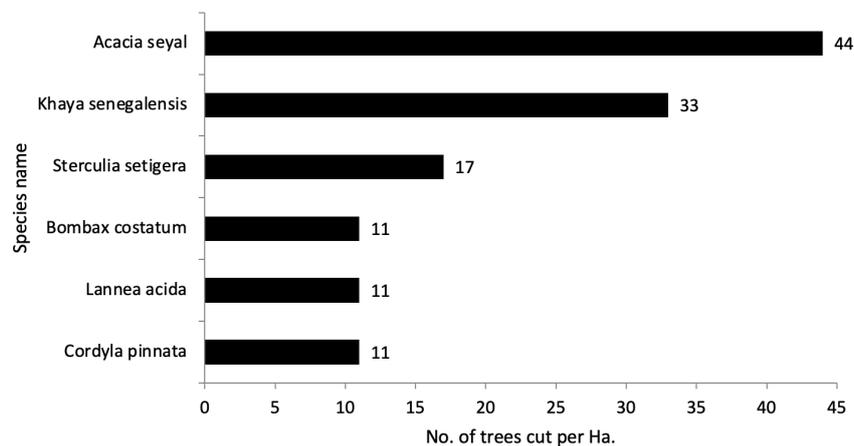


Figure 6. Magnitude of tree cutting in community forests due to cross-border transhumant activities in three community forests in the study area

the owner's consent or without the owner's consent through bribery. Whole-tree cutting occurs less frequently, as owners rarely agree to it.

In whichever form it occurs, either in farms or forests, the continual annual cutting of tree branches and stems creates serious physiological stress on the plants. The following are some of the stresses transhumance imposes on trees and ecosystems.

- Stressful environment: Low water and moisture availability and degraded lands that directly affect plant growth.
- Reduced leaf surface area: Trees require a minimum leaf surface area proportionate to their mass to aid in photosynthesis.
- Reduced branch volume: Leaves need a proportionate size of branch to carry the leaf biomass.
- Reduced investment in fruiting and seed production: Trees divert resources to prioritize survival over reproduction. Stressed trees have less energy to reproduce.
- Lowered regeneration potential: Natural processes of regeneration are hampered.

Social-ecological issues and challenges related to transhumance

Transhumance is important ecologically and socially, with associated merits and demerits. For example, Ayantunde et al. (2010) noted that with the establishment of social relations, the host community will benefit from manuring of crops and milk availability. However, transhumance can be a major cause of farmer-herder conflict due to damage to crops and competition over pasture and water. In some

instances, cross-border herders do not comply with local laws and regulations. The findings of this study show that nearly 60% of cross-border and 45% of domestic herders do not comply with local rules pertaining to use of their natural resources in community forests and farmlands. The conflicts, however, depend on the nature of ties between the hosts and the herders, with minimal conflict occurring where there is a strong social relationship (Ayantunde et al. 2010).

Our study shows that on a minimal scale, informal individual arrangements exist between herders and landowners, where herders are given temporary sanctuary or grazing access for their livestock in exchange for fertilizing the land. Nearly all respondents believed transhumant herders do not follow any grazing route and that respect for local norms and rules governing natural resource management is quite low. Lack of indigenous and traditional institutional arrangements tend to affect sustenance of transhumance practices.

Harmonization of regional frameworks on cross-border transhumance through localized legislation remain undeveloped. This is key, since The Gambia is a departure, transit and recipient country. The PROGEBE¹ project was introduced some years ago and has mapped livestock movement and grazing routes as a strategy to minimize conflict between herders and farmers. The project has identified two broad movements of livestock in The Gambia. The first one is the general short-distance movement (< 30 km) from the south bank of the Gambia River. Herders in this region are engaged in wet season short-distance transhumance in Cassamance region of Senegal as a strategy to protect crop damage by livestock. The second movement is from the northwest to southeast to and from Senegal and crossing the far eastern Gambian borders. This represents the presence of Sahelian livestock in The Gambia.

West African governments recognize the ecological and economic importance of livestock mobility and have signed regional and bilateral agreements (Duguma et al. 2020) to

¹ILRI. 2011. Regional Project for Sustainable Management of Globally Significant Endemic Ruminant Livestock (PROGEBE). Blog. Nairobi, Kenya: ILRI.

facilitate livestock mobility and peaceful cohabitation among populations in border countries. The Economic Community of West African States (ECOWAS) protocol on free movement of people, goods and services is a cornerstone of regional integration. The protocol provides a framework for cross-border transhumance between member states, which includes obtaining the International Transhumance Certificate by the transhumant herders. The certificate indicates information on the herd in terms of numbers, health, planned itinerary and border post crossings. Furthermore, herders are required to respect the legislation in the host country that pertains to forest, water, pasture and wildlife. Dispute resolution mechanisms are also clearly articulated in the protocol.

Analyses of the current transhumance activities in The Gambia – strengths, weakness, opportunities and threats

The results of a strengths, weakness, opportunities and threats analyses on the transhumance practices in The Gambia are presented in Table 2. It is found that one of the crucial weaknesses of the practice is over-exploitation of natural resources. The strongest opportunities entail planting of fodder trees and grasses, introduction of strategic grazing tracks and provision of manure to fertilize the soil. The challenges associated with the system include limitation of resources due to over-exploitation, usage rights and restrictions, weak implementation of rules/protocols, spread of diseases, uncontrolled cross-fertilization of local breeds and impacts of climate variability.

The introduction and spread of invasive species are occurrences associated with transhumant practices. Livestock can potentially disperse seeds of invasive species, either through their skin or faeces, which may have a negative impact on forests, cultivated land or grazing areas. Most of the invasive species constitute weeds, which adapt quickly and can replace good forage species in ecosystems. Some respondents revealed that transhumant herders sometimes experience livestock poisoning due to exposure to toxic forages in the community forests.

Table 2. Summary of strengths, weaknesses, opportunities and threats related to transhumance in The Gambia

<p>Strengths</p> <ul style="list-style-type: none"> • Source of business opportunities for visiting herders and host communities • Source of milk and meat production 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Limited forage and water • Usage right and restrictions • Introduction of invasive species • Weak implementation of ECOWAS protocols • Spread of diseases and uncontrolled cross-breeding in livestock
<p>Opportunities</p> <ul style="list-style-type: none"> • Planting of native fodder trees and grasses • Conflict resolution based on mutual understanding • Strategic grazing/ demarcation of grazing tracks 	<p>Threats</p> <ul style="list-style-type: none"> • Lopping of tree fodder • Conflicts over use of natural resources • Land degradation due to overgrazing and tree cutting

Conclusion

The increased presence of transhumant herders in already-degraded landscapes poses a growing threat to ecosystem resources. A major threat associated with transhumance is environmental degradation within the host community. Both the forests and grasslands in The Gambia are under pressure from transhumant-related activities such as cutting of tree branches, uncontrolled use of water, farmland encroachment and damage to planted seedlings. Over-exploitation of forest resources through overgrazing and felling of tree branches in community forests tends to increase tensions between cross-border herders and the host communities. Despite the existence of the ECOWAS protocol, which provides a framework for cross-border transhumance practices, there is weak implementation governing transhumance activities. Movement of enormous numbers of livestock contributes to uncontrolled grazing in protected areas, including community forests. Cross-border herders move sheep numbering in thousands in some instances, which aggressively feed on pasture and young seedlings and saplings, eventually affecting forest regrowth and ecosystem restoration efforts. The findings generated in the present study can be useful in formulating roadmaps, policies and strategies to help conserve these ecosystems.

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