

Article

Landscape Governance and Sustainable Land Restoration: Evidence from Shinyanga, Tanzania

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Abstract: Inclusive land restoration is increasingly considered to be a critical sustainable pathway to the achievement of sustainable development goals (SDGs) in developing countries. The literature suggests that good governance practices support successful sustainable natural resource management. The study assesses the role of landscape governance in a long-term thriving forest and landscape restoration project in Shinyanga. We apply the good governance principles, which include participation, representation and legitimacy, actor interactors, equity and fairness, accountability and transparency, and respect for local knowledge. Descriptive methods are used to analyze the data collected through focus group discussions and key informant interviews. The evidence suggests that all of the principles contributed positively to the successful restoration, except for accountability and transparency. Building on local knowledge and institutions, the local rules and norms of restoration constituted the foundation of the success. Equity and empowerment were the least influential attributes due to the exclusion of women in the management of the restoration areas. The actors identified the enhancement of the incentives, equitable benefit-sharing mechanisms, performance, and accountability instruments as the key governance aspects that would benefit land restoration at the landscape level. Furthermore, cohesion and synergies amongst the different actors, the governing structures, and recognizing formal and informal institutions' interactions are vital determinants of restoration outcomes.

Keywords: governance; power dynamics; inclusive land restoration; local knowledge and institutions; Tanzania



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1. Introduction

The principal causes of the loss of natural ecosystems and ecosystem functions are land-use change and degradation. Land degradation impedes the food security and livelihoods of 3.2 billion people [1], especially farmers and pastoralists in developing countries. The IPBES (Intergovernmental Platform for Biodiversity and Ecosystem Services) [1] estimates that 75% of the global land surface is significantly degraded; at the same time, pressure continuously grows to boost agricultural production. Africa is particularly vulnerable, with 70% of its drylands and grasslands facing degradation and desertification [2]. In sub-Saharan Africa (SSA), the problem is further aggravated by the existing poverty and hunger challenges, particularly in the ecologically fragile arid and semi-arid areas. The 2015 ELD initiative report estimated that land degradation costs 6.3–10.6 trillion US dollars globally, and SSA accounts for the largest share (22%) of the total global loss of land degradation [3]. In addition to the economic losses, other negative effects of land degradation include adverse outcomes for health, social cohesion and impacts on local management practices.

In the last decade, landscape restoration has increasingly gained momentum, and it offers enormous opportunities that aim to avoid, reverse and reduce the impacts of

various land degradation drivers. The drivers include population growth, unparalleled consumption, an increasingly globalized economy and climate change. It is projected that billions of dollars are disbursed globally on ecological restoration projects, and countless numbers of these projects are unsuccessful [4,5]. Globally, the focus of restoration initiatives has been on inclusive local level restoration efforts of the affected communities and national governments towards achieving Sustainable Development Goals (SDGs) and the Paris climate agreement. These global actions include target-setting processes such as the Bonn Challenge and Land Degradation Neutrality (LDN), and pronouncements such as the New York Declaration on Forests (NYDF) and the United Nations Decade on Ecosystem Restoration. The Bonn Challenge is a global effort that aims to restore the world's deforested and degraded 150 and 350 million hectares of land by 2030, respectively. On the same note, LDN is a paradigm shift in land management policies and practices; so far, over 120 countries have set targets to ensure the necessary land resources to support ecosystem function and services increasing or remaining stable by 2030. The NYDF is a partnership of governments, civil society, companies and indigenous peoples aiming to halve deforestation by 2020 and halt it by 2030. On the other hand, the United Nations Decade of Ecosystem Restoration 2021–2030 aims to accelerate existing global restoration goals by massively scaling up the restoration of degraded and destroyed ecosystems. In Africa, a country-led initiative, the African Forest Landscape Restoration Initiative (AFR100), aims to restore 100 million hectares of land by 2030.

According to FAO [6], the critical elements in landscape restoration include (i) restoring the balance in the social, economic and environmental benefits of ecosystems within a broader pattern of land use; (ii) enhancing the supply of ecosystem services across the range of land uses, i.e., the functionality of a landscape; and (iii) involving people as vital elements of the landscape in implementing practices that aim to optimize land uses. Involving local communities and individuals increases a sense of responsibility to restore and rehabilitate by giving them rights to benefit from the land products. That is also a question of respect for the people involved, their ways of dwelling in their own world and the use and deep meanings locally attributed to the environment. However, a significant challenge for restoration initiatives is their long-term sustainability [5]. Thus, it is necessary to identify the governance structures, benefit-sharing mechanisms and performance instruments that facilitate restoration projects to be long-term, while providing net benefits to human beings and being sustainable at the same time. Governance principles are useful for resource management, as well as for the people and institutions who manage the resources [7–14].

However, there is a weak understanding of governance structures in which both formal and informal systems govern restoration, and how these interact to enhance sustainable restoration. Furthermore, governance studies exhibit a strong instrumental focus in the ways in which formal state and nonstate actors design and implement restoration jointly [7,10], while limited attention is paid to informal decision-making authorities, power equalities and inequalities, ownership, access, the distribution of outcomes, and impartiality in restoration. In truth, these formal institutions do not work in isolation; informal actors complement them in implementing restoration practices and addressing land degradation in specific contexts, such as developing countries where formal institutions are not the only the stewards governing natural resources. This study provides a detailed discussion of inclusive land restoration and the fundamental governance principles applied within the successful Shinyanga land restoration case study.

This paper aims to provide evidence on the key governance principles applied in the Shinyanga region's long-term landscape restoration process. Section 1 is the introduction, Section 2 presents the context of the landscape restoration in Shinyanga Region, and Section 3 presents the materials and methods of the study. Section 4 discusses the applications of governance aspects and emerging issues, and Section 5 concludes the paper.

2. Landscape Restoration in the Shinyanga Region: Context

In the post-colonial era, the Sukuma agro-pastoralists in Tanzania—the majority population of the Shinyanga region—did not encourage trees in the area in order to control attacks from wild animals [15–19]. This was combined with the colonial era of clearing forests and trees to eradicate tsetse flies, creating space for cash crop-based agricultural expansion and, later, forced resettlement under Tanzania’s “villagization” program [15,19]. The clearing of trees and forests resulted in severe aridity and barrenness, a shortage of fodder and water shortages for the pastoral community, which gave rise to conflicts among the communities. Additionally, inadequate rains in this region adversely affected both farming and livestock-keeping activities in the areas, leading to a negative effect on the communities’ livelihoods.

As a result, in 1986, with funding from the Norwegian Agency for Development Cooperation (NORAD), the government of Tanzania (represented by the Tanzania Forest Services, TFS), in collaboration with the World Agroforestry Centre (ICRAF) and later the National Forest Resources and Agroforestry Management Centre (NAFRAC) introduced the HASHI program, Hifadhi Ardhi Shinyanga, which is Swahili for the ‘conservation initiative in Shinyanga’, as a rescuing mechanism for these challenges. HASHI was a national initiative for the restoration of degraded land, of which the main objectives of were to re-green the region, and to reverse desertification and aridity [20]. The program revived a traditional indigenous land management system known as *ngitili*, a local name for dry-season fodder reserves among the Sukuma agropastoralists. *Ngitili* are farmer-led approaches developed from traditional ways of grazing animals while ensuring food security to farmers. This system includes preserving an area of grasses, trees, shrubs and forage from the start to the end of the rainy season [20]. *Ngitilis* encourage trees to be conserved or planted in the grazing lands in order to increase the fodder supply during the dry season (Figure 1). Through HASHI, the agropastoralists had the responsibility of conserving and restoring these plots. Even though, traditionally, the *ngitili* area is left fallow to allow indigenous regeneration, HASHI incorporated different agroforestry practices into the *ngitili*. The program not only focused on pasture management but also incorporated woodland reclamation, soil conservation and water resource management. The agroforestry practices provided diversified incomes, food, fuelwood energy, medicines, and building materials for construction and livestock fodder [15–17,20]. Figure 1 presents a pictorial representation of the landscape restoration in the Shinyanga region by comparing landscapes with and without restoration using the *ngitili* system.



Figure 1. (Left) Typical landscape in the Kishapu district with no *ngitili* restoration activities. (Right) Busongo communal *ngitili* in the Kishapu district, Shinyanga Region.

The introduction of HASHI interventions led to the integration of an array of international organizations, and national and local partners in the restoration process, because they recognized that the key to the area's restoration lay in putting local communities at the forefront of these efforts. As a result, by 2004, at least 350,000 hectares had been restored and 833 *ngitili* had been created in villages across the region [16,18]. Moreover, the rapid expansion of *ngitilis* led to a significant increase in biodiversity. Species that had disappeared for decades have emerged on the landscape and enhanced biodiversity [16]. The HASHI project also revamped village governments' local and traditional institutions (*Dagashida*) and *Sungusungu* (village guards) that govern the *Ngitili* through customary rules and set regulations.

3. Materials and Methods

3.1. Conceptual Framework: Good Governance in Natural Resource Management

Landscape restoration is strongly linked to the governance of natural resources both locally and globally; therefore, governance principles are vital for developing and implementing practical and equitable measures to mitigate the impact of restoration actions [10]. Governance is considered 'good' if it encompasses stakeholder participation, the transparency of decision-making, the accountability of actors and decision-makers, the rule of law, and predictability. 'Good governance' is also associated with the efficient and effective management of resources, and the fair and equitable allocation of resources and benefits [21–23]. Van Oosten [14] states that even though landscape governance is not officially embedded in administrative and political scales, it exists and is performed through informal institutions associated with landscape-related networks and the various actors involved. This infers that landscape governance uses landscape actors who, despite their diversity and dynamics, have a shared sense of responsibility and ownership in informal yet functional landscape institutions [11,14].

Additionally, IPBES [1] shows that legal and policy instruments often commandeer local resources. As a result, if informal land-use systems are not well recognized, this may further degrade landscapes and livelihoods. Several governance-related factors are necessary for restoration. These may include legally binding requirements, new land-use systems or policies, and traditional customs promoting restoration. The actors and institutions involved in restoration actions need to incorporate and display good governance qualities and principles when implementing restoration measures within landscapes [9,11–14]. Otherwise, the measures implemented would be either short-lived or unsustainable.

This study applies good-governance dimensions, criteria and indicators from the Monitoring and Designing Landscapes framework by Minang et al. [24] (Figure 2). It is important to note that we use landscape governance, not forest governance, because Shinyanga is a restoration scheme aimed at reclaiming a degraded landscape that is not only a forest ecosystem. Thus, applying the guiding framework for Assessing and Monitoring Forest Governance [25] would not be adequate. Landscape governance requires a framework that blends forest governance and general good-governance principles. The forest governance principles apply when the resource is in place, or apply the governance to the forest ecosystem.

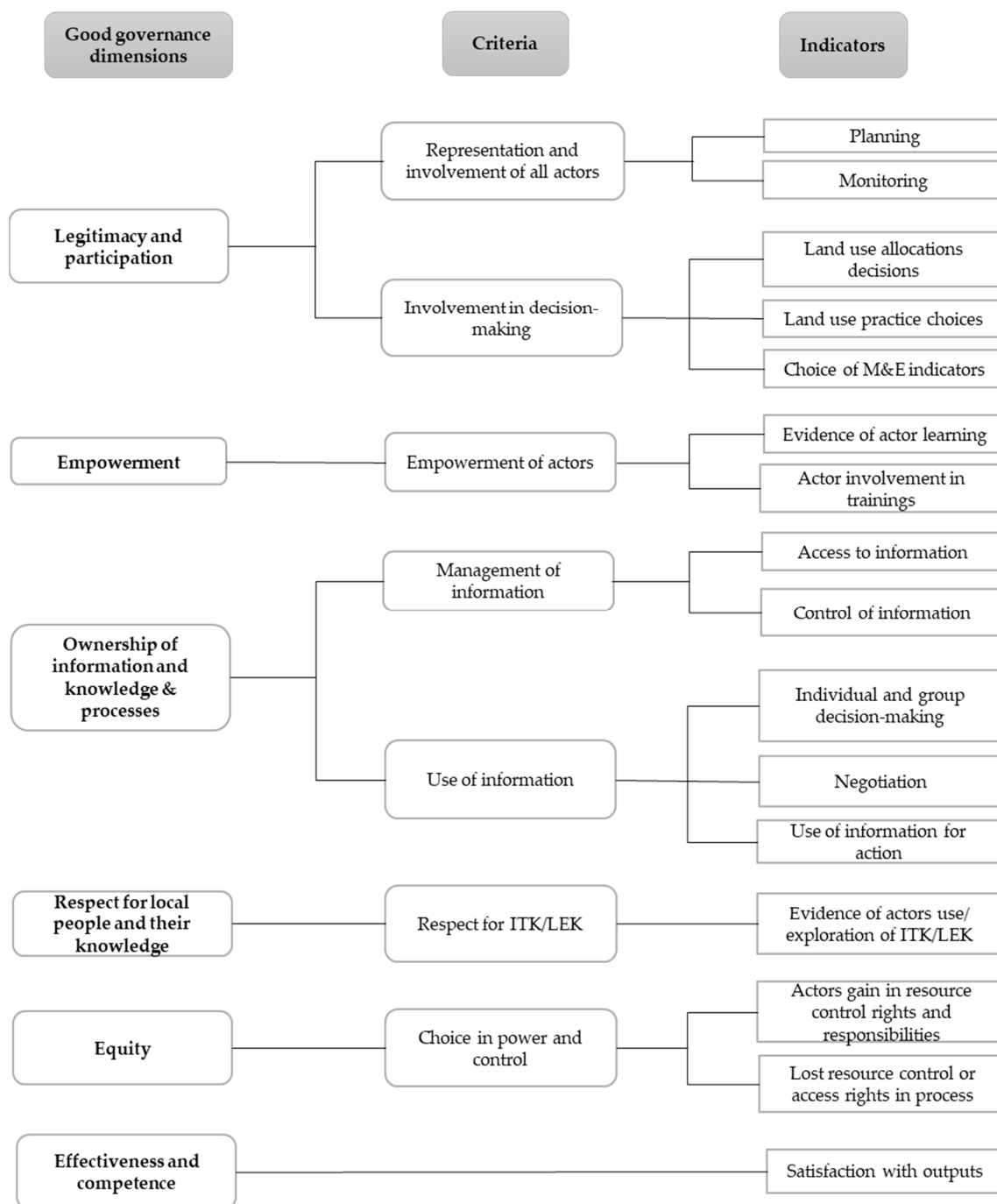


Figure 2. Conceptual good governance framework for the assessment of landscape negotiation processes. Re-adapted with permission from ref. [24,26]. 2015 ICRAF.

3.2. Study Area

The Shinyanga Region, located in Northern Tanzania, currently covers 18,901 km². The region borders the Mwanza, Mara and Kagera Regions to the north, and to the south the Tabora Region. The Kigoma Region borders to the west, and the Simiyu Region to the east [27]. At present, the region has five districts: Kahama Rural, Kahama Urban, Kishapu, Shinyanga Rural and Shinyanga Urban. Before 2012, the region had nine districts: Bariadi, Maswa, Meatu, Itilima, Kahama Rural, Kahama Urban, Kishapu, Shinyanga Rural and Shinyanga Urban. From 2012, the Simiyu region was formed due to administrative subdivision, and it comprises five districts: Bariadi, Busega, Maswa, Meatu and Itilima [28].

Shinyanga has a population of 1,534,808 people and a population density of 81 people per km², with an average household size of 5.9 [28]. It is home to the Sukuma ethnic group, and Sukuma is the indigenous language spoken. According to FAO [29], the Sukuma community believe that women do not have the right to own land and can only make decisions on crops limited to cassava, legumes and maize.

The area is semiarid, with highly variable rainfall between seasons that is erratic and poorly distributed. The main source of livelihood and socioeconomic activity in the region is livestock keeping, with 53.7% of the population rearing livestock [16]. In 2012, the region was estimated to host over 80% of the country's livestock population [19]. Agriculture is the other significant economic activity in the region. The main cash crops grown include cotton, rice and sunflowers. The other livelihood activities include fishing and mining, such as gold mining in the Kahama district and diamond mining in the Kishapu district. The study was conducted within the five districts where the HASHI project was implemented (Figure 3). The districts are also within two agroecological zones with distinctive characteristics: the miombo woodlands (Kahama Rural and Kahama Urban) and the dry savannah (Meatu, Kishapu, Shinyanga Rural).

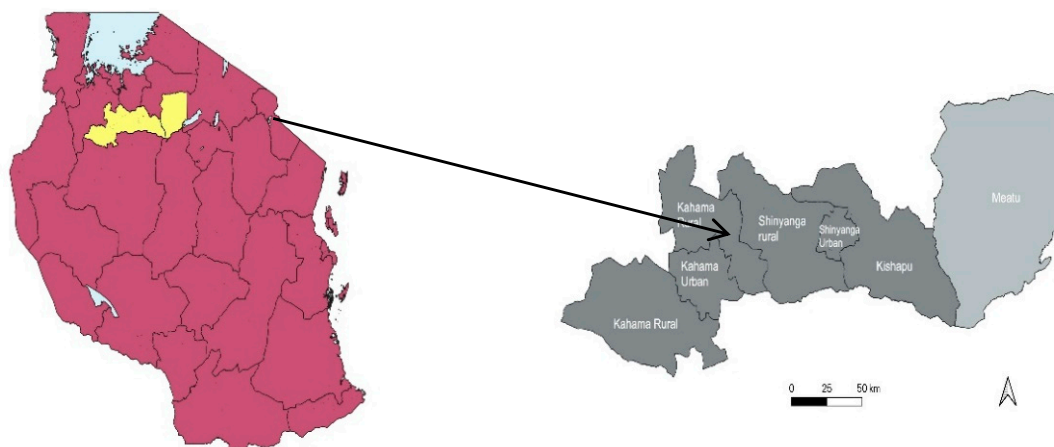


Figure 3. Map of Tanzania showing the location of the Shinyanga region where the HASHI program was implemented (yellow). The gray map shows the current districts in the Shinyanga region (dark gray) and the Meatu district (light gray) in the Simiyu region.

3.3. Data and Materials

3.3.1. Design

Multiple data and information sources, including document reviews and interviews with key informants, were employed at the district level in order to understand the relations and interactions. We applied a qualitative research method—focus group discussions (FGDs)—to gain a more productive and detailed description of the process. Focus group research is a type of qualitative method which utilizes semi-structured interviews to produce transcripts of group discussions as primary data [30], using purposeful sampling to obtain the broadest range of information and perceptions on restoration governance. The case study format was used to examine the data at the micro-level. These have been proven to be a practical solution when a large sample population is challenging to obtain, and they present detailed behaviors of the subjects of interest and data of real-life situations [28].

3.3.2. Formation of the Focus Groups and Key Informants

The key informants and village government heads advised on the selection of the FGD participants involved in *ngitili* ownership and/or management. These experts had close interactions with the 14 communities involved in the HASHI project and guided the community members to nominate men, women and youth (under 30 years old) to partici-

pate in the FGDs; hence, the participants were not selected randomly. The groups were differentiated by gender and youth. A total of 14, 13 and 8 groups of interviews comprised of men, women and youth, respectively, with a total of 190 participants, were conducted between November and December 2018. The key informants included representatives from the government offices and research institutes involved with the HASHI program.

3.3.3. Analysis

The FGD sessions were recorded verbatim and analyzed independently by researchers using a modified version of the available guidelines for the analysis of focus group data [31]. The data analysis consisted of summarizing the discussions, tabulating the scoring exercise, and detailed content analysis. The discussion summary was partially shaped during the group sessions by periodically reiterating the groups' observation on their opinion and asking for feedback, following the model outlined by Krueger [32]. The detailed content analysis of the transcription involved breaking down the group discussion into individual concepts, grouping the concepts together into related factors, and analyzing the most frequently mentioned factors. On the completion of the qualitative analysis, the scorecard questionnaire was quantitatively analyzed in terms of descriptive statistics. We applied a scorecard in the appraisal of the strength of the governance principles for each of the communities. We assessed the attributes on a scale of 1 to 5; 5 being when the governance attribute is of high value, 4 being when the governance attribute is of average value, 3 being when the governance attribute is low value, 2 being when the governance attribute is of anecdotal value and 1 being when the governance attribute is of no value in the management of *ngitili*.

4. Results and Discussion

4.1. Application of the Governance Aspects of Shinyanga Restoration

In Tanzania, considerable attention to the decentralization of forest vegetation management and forest products has involved transferring the control of natural resource management decision making to the local people. This creates space to accommodate local interests and livelihood needs, ideally empowering the users of the resources to benefit from and influence the decisions made [16,33,34]. Kajembe and Kessy [34] state that this shift was motivated by increasing incentives for local communities to conserve and restore natural resources. Furthermore, state agencies were recognizing the communities' critical role in the management and the need to regain a sense of ownership and empower local people over their forest resources. Primarily, the restoration was driven by the local people restoring ecosystem functions as a livelihood strategy [18,35,36] that interacted with various governance principles, as discussed.

Table 1 shows all of the governance attributes in restoration, and all of the attributes were rated above average (>2.5) by the men, women, and youth groups. Most of all, the communities in the Shinyanga region underscored the importance of respect for local knowledge and ecological processes, as evidenced by a ranking in which it emerged as the highest governance principle leading to the restoration's success, with equity being the lowest.

Table 1. Respondents' participation in the FGD by gender.

Governance Attribute Clusters and Specific Attributes	Mean Score on Scale of 5		
	Male Group (<i>n</i> = 14)	Female Group (<i>n</i> = 13)	Youth Group (<i>n</i> = 8)
1. Legitimacy and participation	4.35	3.65	4.02
1.1 Representation and involvement of all actors	4.50	3.31	4.13
1.2 Consultations involved in the planning activities of <i>Ngitili</i>	4.57	3.62	3.88
1.3 Actors involved in monitoring	4.57	3.69	3.88
1.4 Actors in <i>Ngitili</i> involved in decision making processes	4.14	3.69	3.63
1.5 Actors in <i>Ngitili</i> involved in the land use allocation decisions	4.36	3.92	4.63
1.6 Actors in <i>Ngitili</i> involved in the land use practice choices	3.93	3.69	4.00
2. Empowerment of actors	4.16	3.52	3.59
2.1 <i>Ngitili</i> ownership building the capacity of actors	4.21	3.46	3.88
2.2 <i>Ngitili</i> building the land tenure rights	3.64	2.69	3.13
2.3 <i>Ngitili</i> building the management rights of natural resources	4.57	4.00	3.75
2.4 <i>Ngitili</i> building the capacity of local institutions	4.21	3.92	3.63
3. Ownership of information and knowledge and processes	3.83	3.89	3.88
3.1 Access to information on <i>Ngitili</i>	3.93	4.00	3.63
3.2 Rights to manage information	3.71	3.69	4.00
3.3 Control of information	4.07	3.69	3.25
3.4 Right to use of information	4.14	4.08	4.00
3.5 Individual and group decision making ability	4.14	4.23	4.13
3.6 Involvement in negotiation processes	3.57	3.92	4.13
3.7 Rights to use of information for action	3.21	3.62	4.00
4. Respect for local people and their knowledge	4.39	4.00	4.88
4.1 Respect the Indigenous Technical knowledge (ITK)	4.43	4.08	5.00
4.2 Respect for Local Ecological Knowledge (LEK)	4.36	3.92	4.75
5. Equity	3.36	2.79	3.13
5.1 Choice in power and control of natural resources in <i>Ngitili</i>	4.64	3.62	4.13
5.2 Gain in resource control rights and responsibilities	4.29	3.15	4.50
5.3 Loss of resource control or access rights in <i>Ngitili</i>	1.14	1.62	0.75
6. Effectiveness and competence	4.07	4.19	4.38
6.1 Satisfied with the outputs of <i>Ngitili</i>	4.29	3.92	4.50
6.2 Extent to which <i>Ngitili</i> is a success	3.86	4.46	4.25

Generally, for female respondents, participation and legitimacy, equity, and respect for their knowledge was lower compared to the men and youth in the FGDs. This could be associated with the societal norm of the Sukuma tribe, in which households are maleheaded and tend to suppress female expression in front of men [29]. However, women scored the lowest in most of the attributes. In 13 of the 24 attributes, they scored the lowest compared to the men, who scored lowest in 4 of the 24 variables, indicating a significant gender imbalance in the landscape governance (Figure 4).

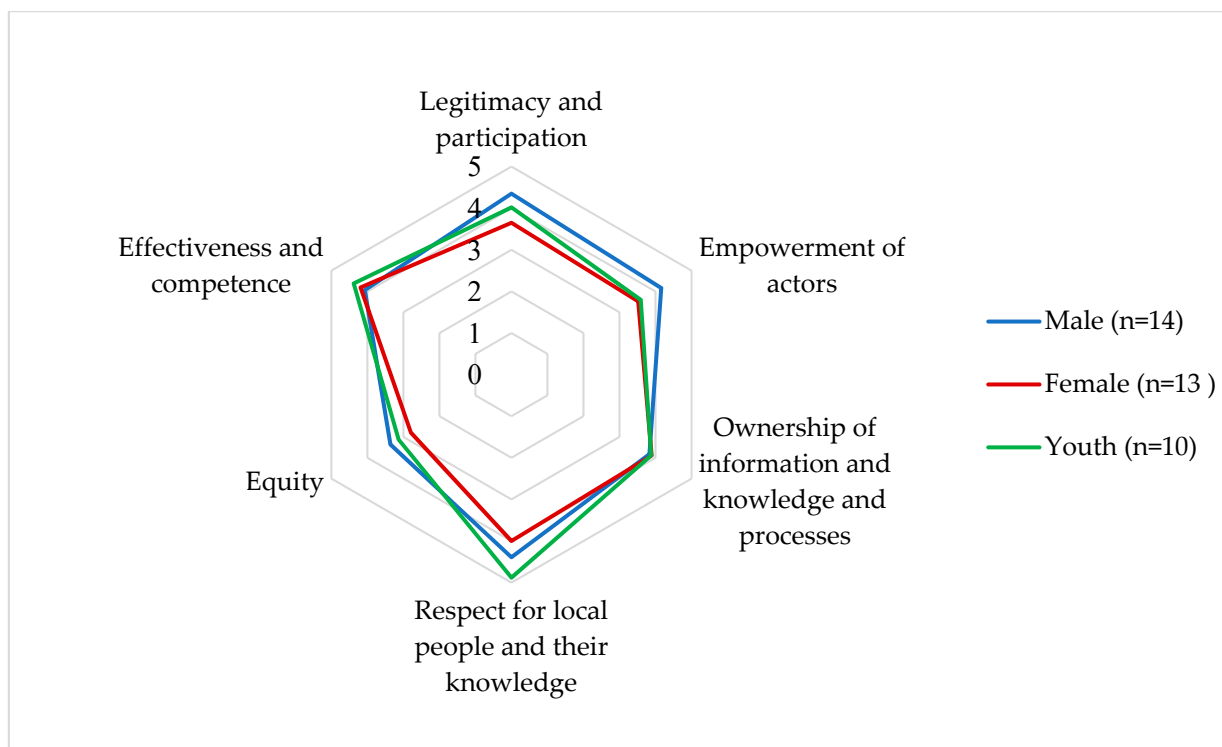


Figure 4. Variations of the perceptions in landscape governance principles across the groups.

4.1.1. Participation, Representation and Legitimacy

Community-based restoration is built on the inclusive participation of actors and stakeholders in decision-making, or through legitimate intermediaries representing and involved in restoration practices. Through detailed FGDs and key informant interviews, we found a diverse number of actors who were involved in the HASHI program in the Shinyanga landscape. They comprise local, regional and national actors, the private sector, non-governmental organizations, donor organizations, and research and religious institutions. The local stakeholders include the village government, individuals, village guards (commonly known as *sungusungu/mgambo/mlinzi*), local primary and secondary schools, churches, and village community welfare and environmental committees. The national and regional government stakeholders include the government (commissioners at the region, district, division and ward levels), parastatals, ministries, courts, police and local authorities. The actors have well-defined structures, roles and responsibilities within the restoration practices, as shown in Table A1 in Appendix A.

The governance of restoration in the Shinyanga region mostly relies on a blended system of both formal and informal traditional institutions, in which the formal institutions such as districts, wards, and regional- and national-level authorities intervene where necessary. Anchored on the village government, the stakeholders of restoration within a village include village elders (who lead the village government), individuals, groups, sub-village (hamlets) leaders and village guards, and village committees. The village government is mandated to set and enforce village by-laws, to issue fines and permits for illegal uses of natural resources, to resolve conflicts, and to provide education on social welfare including health, education, nutrition, land, water and environmental conservation. The village government also provides an avenue for formal institutions and other external actors to link with the communities. The village governments are also involved in monitoring restoration, determining how the actors are involved and evaluating whether they prioritize the village and community needs. Echoed by Mansourian et al. [37] and Selman [38], reliable and locally respected institutions that deal with stopping encroachment, support user rights and enforce rules can play a vital role in the long-term effort implied by restoration.

However, there were disproportions in the perceptions of legitimacy and representation (Figure 5). Even though no quotas were involved in the communal *ngitilis*, decisions on the involvement, control and use of natural resources were primarily led by men for the private/household *ngitilis*.

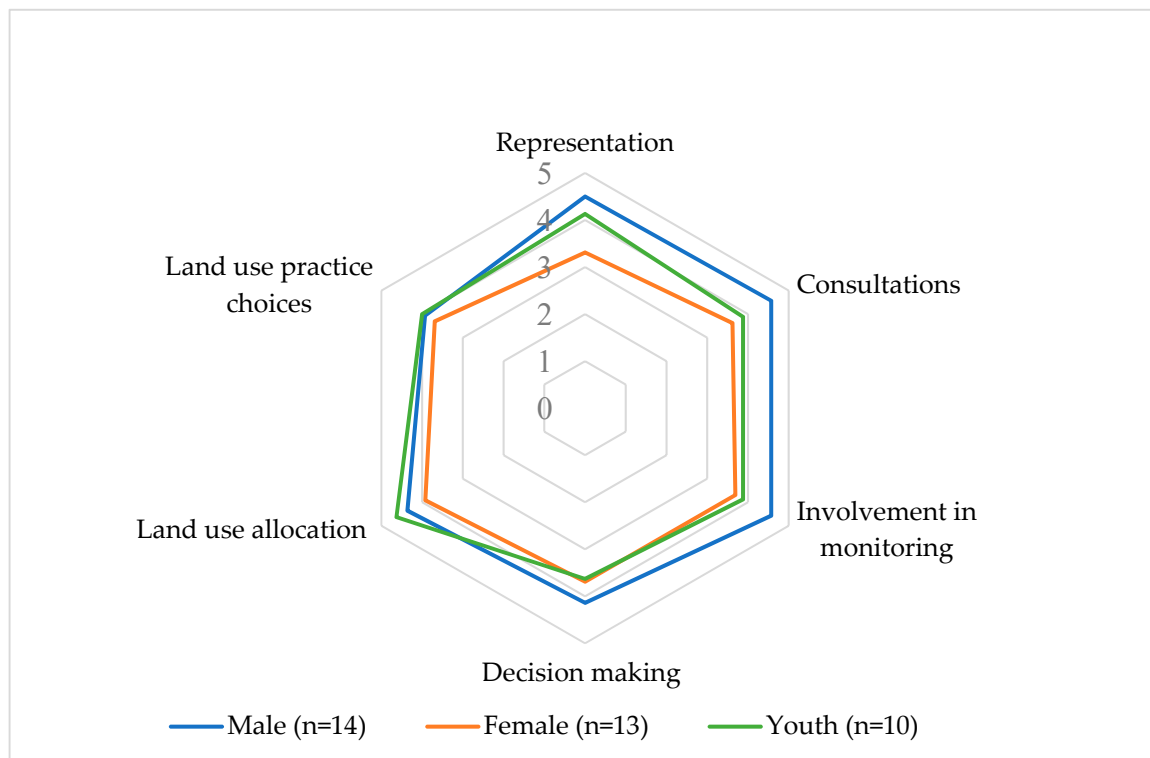


Figure 5. Variations of perceptions in legitimacy and representation.

Even though the HASHI program encouraged social welfare and individual welfare, there were a few important actors who were missing in all of the communities. These missing actors have direct and/or indirect and long-term impact on the success of restoration efforts. From the interviewed communities' perspective, even though their involvement did not impede the restoration efforts, it slowed the process in some areas, and their involvement may have propelled the restoration further and at a faster rate. The missing actors from the various villages are as shown in Table A2 in Appendix A.

The geographical location and access to infrastructure were not influencing factors for the missing actors. The missing actors were mostly due to the communities' priorities for the landscape, the preferred economic and income-generating activities, and the actors involved with the village governments in previous projects. Agricultural extension officers and forest officers emerged as the top missing actors that could have been involved in the restoration process to a greater extent in the villages. In most communities, traditional healers were also missing. They often access the *ngitilis* searching for roots, barks and stems for medicinal purposes, and were not considered significant actors.

Additionally, in some villages, groups of women, youth, pastoralists and charcoal traders who rely on the wood and other ecosystem services provided by *ngitilis* were not as highly involved. In some areas, this resulted in conflicts and friction amongst the communities, as a few missing actors trespassed into the restored areas to access resources. Furthermore, the actors excluded had misconceptions and a lack of awareness that led to some local leaders and community elites being co-opted within the existing power structures. They derived personal benefits from selling some of the access rights of communal *ngitilis*, rather than mobilizing active social transformation involvement.

4.1.2. Effectiveness in Power Dynamics, Actor Interactions and Empowerment

The integration of the different actors in *ngitili* management has undergone some changes in different villages in order to fit specific communities' priorities; they are thus used as sources of environmental and socioeconomic transformations. As such, both institutions and individual stakeholders have diversified the approaches to restoration activities, capacities and roles for the different districts and villages. The diversification built communities and local institutions' capacity in the management of the restoration process, provided different conservation benefits, introduced benefit-sharing mechanisms, and addressed the land tenure rights and management rights of natural resources in the areas. For instance, in Manyada village in the Shinyanga rural district, TATEDO is involved in advocating for conservation measures, providing improved energy-saving cookstoves that use less firewood harvested from the *ngitilis*. In contrast, in Ngulu village, in the Kahama district, TATEDO and NAFRAC provided improved cookstoves, and also concentrated on piloting and exploring mechanisms for REDD+. In Mwambiti village, in the Meatu District, the AMREF and BioRE companies train youth and provide tree and cotton seedlings to be used in farmland and *ngitilis*, respectively. Figure 6 illustrates the interactions between the actors of selected villages. The larger the circle, the higher the degree of stakeholder involvement, and the more the overlap, the higher the extent of interaction and linkages between the stakeholders.

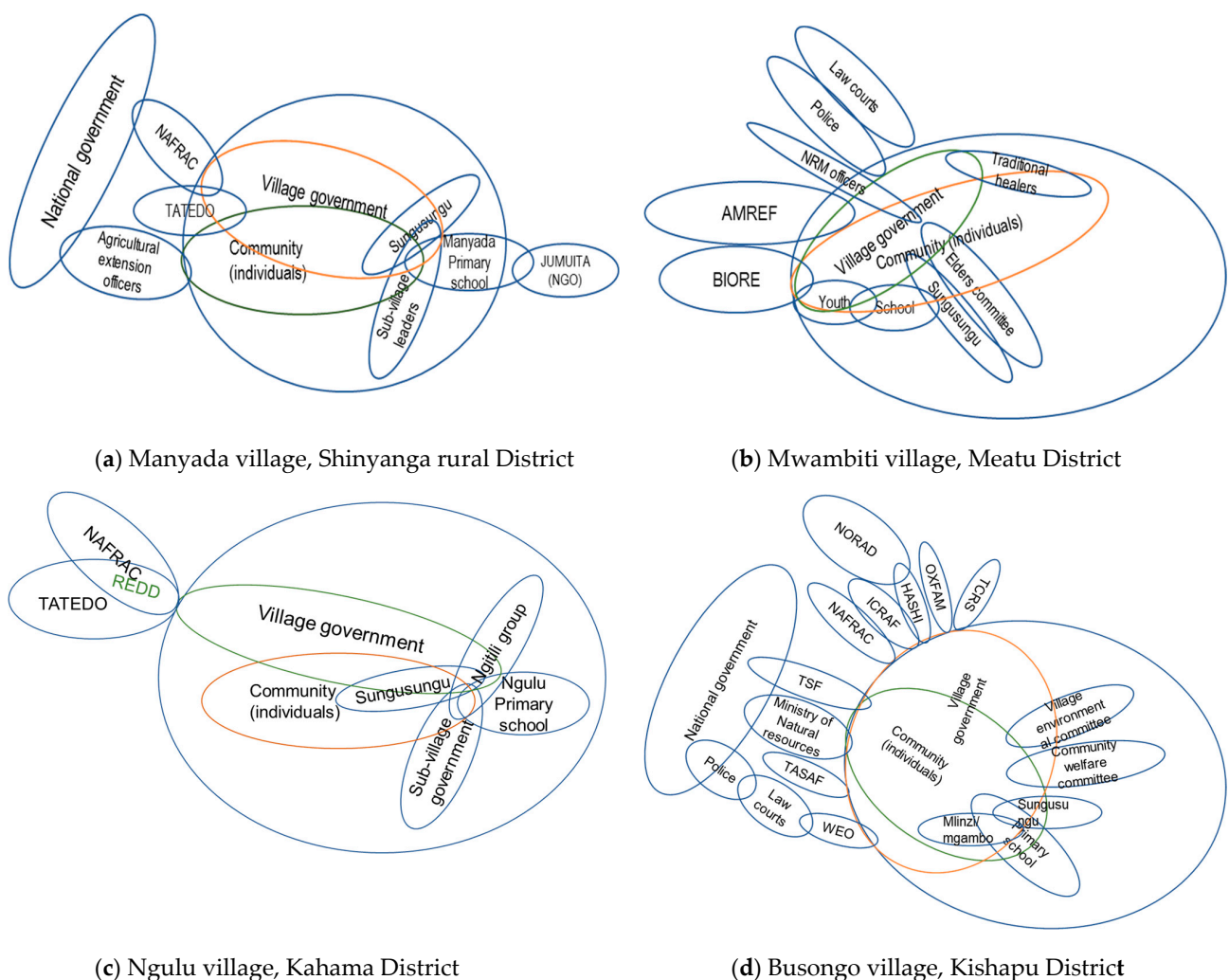


Figure 6. Village-level involvement of different institutions and stakeholders, and their interactions in four villages. Note that the big circle is the designation of the village.

Despite the majority of communally owned *ngitilis* thriving or being in stable conditions, in some communities, the sizes are declining. In one community, the status of the *ngitili* is unknown. As indicated in Table 2 for the 14 communities that participated in the discussions, the internal actors identified within the villages (84) were higher than the external actors (56) involved in the restoration process (Table 2). Notably, Busongo community in the Kishapu district, with the highest number of actors, is hailed as the model and is often used as a learning model for restoration. It has amassed national awards, and the high number of internal and external actors involved in the restoration within the village is one of the contributing factors to its success.

Table 2. Community perspectives on the number of actors involved in *ngitili* management ($n = 14$).

Districts	Villages	State of Communal <i>Ngitili</i>	Gender Engagement	Number of Actors Involved in <i>Ngitili</i>		
				External	Internal	Total
Kishapu	Ndololeji	Stable	Good	2	4	6
	Busongo	Good	Good	12	7	19
	Ikonda A	Declining	Average	2	5	7
	Bubinza	Good	Average	2	6	8
	Magalata	Not willing to be expressed	Only male	2	7	9
Kahama rural	Ngulu	Stable	Good	3	6	9
	Bukwangu	Good	Average	5	6	11
Kahama Urban	Kilago	Good	Average	4	6	10
	Mwendakulima	Declining	Good	5	6	11
Shinyanga	Manyada	Declining	Good	4	6	10
Meatu	Mwambiti	Good	Good	5	8	13
	Mwamishali	Good	(Female-led)	3	5	8
	Bomani	Declining	Poor	1	5	6
	Mwambegwa	Good	Average	6	7	13
Total number of actors				56	84	140

Note: The state of the communal *ngitili* is based on the perception of the communities.

However, both successful and failing *ngitilis* have various actors involved in the restoration, with an average of six internal actors. The communities that reported good conditions for the communal *ngitilis* had three to 12 external actors, whereas the declining *ngitilis* had one to five external actors. Furthermore, the communities with declining *ngitilis* also reported encroachment of settlements near towns, the expansion of farmlands and grazing areas, and mining activities into their *ngitilis*. Two of the four declining communal *ngitilis*, in the Meatu and Kahama urban districts, were primarily affected by urbanization and the expansion of the adjacent towns and settlements. On the other hand, in Shinyanga and Kishapu, the rural districts, the expansion of farmlands and grazing areas was the primary factor.

A considerable number of the *ngitilis* are declining due to urban growth and broad changes in economic strategies and landscapes. Actors operating in multiple scales, sectors and jurisdictions, such as the national government institutions, can override the decisions over natural resources within a landscape. For instance, half the area which the Mwendakulima communal *ngitili* occupied was transferred to the Buzwangi gold mine company's ownership to extract gold. Understandably, the priority to provide economic benefits to the country overrides restoration actions; however, the community has not been reallocated land for the restored area lost. The local community also acknowledged that they were not involved in the decision-making process, resulting in a disconnect between the restoration process and the mining activities in the area. The lack of involvement of local communities in decision making is further echoed by the current forms of power

used by diverse actors to influence the restoration process over economic priorities [12,14]. Questions of viability in the face of broader socioeconomic changes, competing economic interests, priority setting and resource allocation in natural resource organizations often involve balancing competing interests and values in lieu of hierarchical and politically complex settings with multiple interacting actor relationships. However, there is need to ensure that positive direct benefits accrue to the local communities from the *ngitilis* in order to motivate further conservation and restoration. This would also ensure that the *ngitilis* are economically attractive ventures. Such efforts include carbon trading and the value-addition of nature-based products from *ngitilis*' rotational grazing investment in a designated area, among others.

4.1.3. Respect for Local People and Knowledge Processes

Restoration through the involvement of local people in the management of natural resources based on their indigenous knowledge and traditional practices has gained significant wide-reaching momentum. The HASHI program did not discard the community's home-grown efforts. Instead, it adopted the local land management system as *ngitilis* and integrated it with multiple-use agroforestry trees. Intrinsically, this was viewed not as an imposed system, but as part of their customs, resulting in a more natural uptake. Respect for traditions and norms, and building on these processes in restoration, was regarded by the community consensus as the key factor in the Shinyanga restoration's success.

Similarly, most decisions on restoration within the *ngitili* customarily are facilitated in a participatory way, involving key stakeholders. Thus, no quota was imposed on the interested community members in the management of the *ngitili*. In many of the villages, everyone is involved in the *ngitili* restoration, regardless of age, gender, or socioeconomic status. Decision making regarding the communal *ngitilis* is based on the Sukuma society's norm; the youngest give their views first, followed by the women, and finally, the men [16]. The elders then sum up all the opinions expressed, and discussions continue until the community and the village government resolve their differences and agree upon a way forward which everyone follows. The HASHI program considered local environmental knowledge to be imperative, adopted a similar nature in decision making and participation, and reinvigorated the traditional institutions to function in increasing the communities' adaptive capacities [16–18].

As a society, the agropastoral and the pastoralist communities regard social cohesion highly, and thus, social capital played a significantly crucial role in the conservation of *ngitilis*. Even before the HASHI program, some of the communities, such as Busongo in the Kishapu district, had manifested strong social cohesion by unilaterally acting against land degradation, which was possible under long-held social norms of Shinyanga and the inherent trust between the local leaders and villagers. The custom of fearing to become a community outcast has played favorably in land restoration, as one respondent said, "people fear being cast away from the village than they fear to pay fines or taken to court—once you cast away, nobody attends your social events or assists you when you need help". In this case, destroying the *ngitilis* contrasts with community rules, and is therefore undesirable.

However, this has not been short of its downsides. Defining the *ngitilis*' boundaries led to a resurgence of otherwise dormant conflicts between some villages and the migratory pastoralists who migrate in search of pastures, who no longer had access to such communal areas without authority from the village governments. In other instances, recognizing such diversity in governing structures raised intra-village and local power struggles and conflict due to the introduction of responsive and accountable local government systems which the recognized traditional authorities.

4.1.4. Equity and Fairness

Equity, which also a crucial factor in Shinyanga's restoration, focuses on who gains and who loses resource control rights and responsibilities, the choice in power, and who controls

the natural resources within the *ngitilis*. In equal capacity, both men and women were involved in activities such as planning, monitoring, decision making and capacity building for communal *ngitilis*. Despite this, they consistently scored the least in the majority of the governance aspects. This can be attributed to the fact that the control and use of natural resource decisions are primarily led by men for the private/household *ngitilis*.

Out of the 14 villages that participated in the discussions, only one community, at Magalata village in the Kishapu district, did not have any women engaged in the management of the *ngitilis*. The Magalata community is mostly comprised of Wataturu ethnic communities, who are a pastoralist community and do not participate in any farming activities. Unlike their counterparts from the other villages, pastoralism is the primary livelihood source. They migrate seasonally in search of pasture and water for livestock, rarely set aside private *ngitilis*, have poorly managed communal *ngitili* to date, and the current state of the *ngitili* is unknown. The Busongo community in Kishapu and Mwamishali, in the Meatu districts, saw the growth of their communal *ngitili* and emphasized women's involvement as a critical factor in their success. These communities explained that women were mostly the custodians of these areas and used most of the forest products for firewood, medicine, and grass for roofing purposes. Thus, including them in the restoration-related activities was paramount, as the women ordinarily harvest firewood within the *ngitilis*, and this would encourage sustainable harvesting. Their participation in the restoration activities allows them to make informed decisions on what to harvest, when, and how much was harvestable.

Shinyanga's restoration was also driven by financial (REDD+) and non-financial incentives and conservation benefits, such as socioeconomic and ecological benefits, including reduced aridity and desertification, improved water availability, better weather conditions, the greening of the landscape, and wind buffering. Furthermore, improved access to firewood, saving time for women; better economic conditions through enterprises in beekeeping; fruits (mangoes, tamarind, oranges, pawpaw, lemon, wild fruits); medicinal purposes; timber and other wood products; fodder, gum and resin harvesting; better conditions for livestock rearing and farming; and reduced conflicts between farmers and pastoralist were directly reported by respondents during the interviews. Additionally, satisfaction with the outputs of *ngitilis* was also crucial for the restoration. *Ngitilis* have also enhanced community development projects within the villages and provided better housing structures (as most households can afford to build brick houses and schools and health facilities built from the income generated from the *ngitilis*), school fees and even dowry. The direct individual benefits from the *ngitilis* encouraged the restoration efforts within these areas and influenced some communities to change their lifestyle from migratory pastoralism to settlement in one area.

4.1.5. Accountability and Transparency

The presence of a well-defined informal governance system in the Shinyanga landscape enabled the actors in the restoration process; however, this was to a lesser extent, compared to the other governance aspects (Table 1). In this context, accountability and transparency encompass a clear existing structure in the management of natural resources, clarity and the free flow of information among the enabling actors to understand and monitor processes, institutions and use the information for action. They also comprise the legal framework and policy instruments that recognize the ownership of *ngitilis* to support and protect land tenure.

Even though individuals and/or a group can own land with title deeds, land ownership in Tanzania is complex, and the land is state-owned. Individuals or groups can own land in informal ways (without title deeds), but will have the rights to control and use the land as they see fit, guided by a set of local by-laws that complement the statutory law. The latter is based on having evidence from the village government and surrounding neighbors to confirm ownership. Thus, tenure and property rights, the condition of access, use, management and benefits from resources are based on customary law [38].

The government enacted the 1997 Land Policy and the 1999 Land and Village Land Act to allow for the formal recognition of village land, and these recognize the communal *ngitili* and allow enforcement using by-laws to encourage communities to manage resources sustainably. These policies created a framework for local communities to possess land title deeds and reduce tenure insecurity. The National Forest Policy and a revised policy draft produced in 2008 also emphasized the security of rights and states “ . . . clearly defined forest, land, and tree tenure rights will be instituted for local communities, including both men and women” [39]. The laws also created a provision for the development of the management plans of the communal *ngitilis* by allocating grazing seasons and tree/harvest management plans.

The main types of *ngitili* tenure systems are state-run (by TFS), private (individual or institutionally owned, such as by religious organizations and schools) and communal *ngitilis* (villages, groups and hamlets/sub-villages). By managing private *ngitilis* properly, individual land ownership rights are strengthened; even when the owner does not have a certificate of land ownership, more substantial ownership rights are acquired. Communal *ngitilis* managed by a village forest committee or environment committee have the right to make and enforce rules about the harvesting and management of the *ngitili*, to exclude others, to monitor resource use and to sanction violators. The village government monitors the timber harvest and other tree products, collects fines, and retains royalties which contribute to prioritized community development projects. Simultaneously, an increase in tenure security within the region is attributed to secure customary rights to the community forests (communal *ngitilis*), which have grown over time and have been an incentive for continued restoration efforts.

Decision making regarding the communal *ngitilis* is viewed as being transparent by the community. Decisions regarding restoration and *ngitili* management are made at the village level during a public forum or ‘baraza’. The village government involves the community through public meetings, land committees and environmental committees for decisions related to restoration activities. Decisions must be approved by most of the villagers before actions take place. At the household level, the family—especially the household heads—take charge of the decision-making process, and in some cases, the household members are involved in the decisions. The involvement of multiple stakeholders is characterized by diverse views, interests and goals. Thus, the village government plays a pivotal role to ensure a shared goal and vision for restoration in a specific community. The village government has a say in the rights of access to resources and land use and offers a basis for dialogue and an entry point for both external and internal actors. Hence, necessitating effective cooperation and coordination between actors enables them to have a sense of accountability towards the achievement of the restoration goals, and it also allows them to actively participate in the entire process. The active engagement of local stakeholders in the decision making, collaboration and implementation remains vital in the success of restoration efforts. Besides this, intermediary research and non-governmental organizations’ involvement helped build trust between the local community and the landscape actors. Transparent processes were desirable for the resolution of the trade-offs that are needed to improve equity in restoration practices.

Due to the numerous actors involved in the Shinyanga region’s restoration process, there was a disconnect between the decision-making process regarding the other economic activities undertaken in the same areas. Most of the time, restoration takes a back seat compared to the other economic gains to be obtained from the same resources. The encroachment on the *ngitilis* by new settlement areas and urbanization growth led to elite capture, with some local leaders and a few people benefitting from such activities instead of the communities that ran the communal areas.

4.2. Emerging Insights

As evidenced by Shinyanga’s success, restoration systems should adopt a combination of governance principles, thereby boosting actors’ ability to formulate and implement effec-

tive restoration measures. However, emerging insights may provide guidance and direction for the planning and implementation of new projects that aim for sustainable restoration.

4.2.1. Governance Structures Ought to Build on Existing Systems to Support Buy-in by Communities

In the case of Shinyanga's restoration, respect for local people and their informal governing systems contributed greatly to its long-term success. Considerations such as the local rule-making structures and the use of existing indigenous restoration knowledge facilitated the HASHI program by creating an interface through which local communities found ways to translate the supplemental external agroforestry information into their local restoration knowledge. Supported by myriad studies showing that for a restoration program to achieve sustainable and inclusive outcomes, it ought to consider the local conditions, governing systems and actors involved in the landscape [7,10,14,36,40]. These include the maintenance of the socio-cultural identity, tenure systems and institutional frameworks operating in the landscape.

It is important to note that landscape decisions are based not only on local conditions, but also on processes and networks beyond the physical and administrative landscape boundaries [14]. Thus, different actors within the landscape may have different interests and scales of operation (geographical and political), and may interact through partly overlapping networks. These interactions and networks form a web of arrangements within both the formal and informal governance facets. The local governing systems, in this case, provided clarity on the rights and responsibilities of the different actors involved, as well as a fair justice system that allowed conflict resolution and recourse whenever needed. Because it was an already established system of trust and communication between the local people and governing bodies, there was a higher likelihood of a project to succeed by aligning itself to this. Furthermore, the process necessitated active participation by landscape actors/stakeholders, which at times involved complex decision-making processes involving divergent stakeholder interests, negotiations and potential trade-offs.

In Shinyanga's case, the provision of guidance and direction to the planning and implementation of the project enabled the restoration to be sustainable, and enabled community 'buy-in' while avoiding and reducing the impacts of land degradation. Communities trusted the actors involved in the restoration process, primarily because they built on their existing traditional institutions and ownership of the idea of restoration by the community itself. At the same time, the pre-existing social capital (bonding) manifested in the collective action was also instrumental in the restoration.

4.2.2. Equitable Benefit-Sharing Mechanisms and Representation

In some cases, restoration activities may intensify conflicts over the rights of access to resources and land use; good governance and equitable-sharing mechanisms could offer a basis for dialogue in an otherwise conflictive process of negotiation marked by power imbalances and discord [11,13,14,39]. The benefit-sharing mechanisms address who bears costs and benefits, define who participates and how, and recognize rights, values and priorities for the separate groups participating in the project. For example, communal *ngitilis* managed by a village forest committee or environment committee have the right to make and enforce rules about the harvesting and management of the *ngitili*, exclude others, monitor resource use and sanction violators. The village government monitors the timber harvest and other tree products, collects fines and retains royalties, contributing to prioritized community development projects. Some of the communities that recorded higher success rates tended to see the advancement of their communal and household *ngitilis* because of the crucial involvement of women and youth. One of the success factors was the diverse representation of facets of the communities in the HASHI restoration process leading, to a significant reduction in conflicts between farmers and pastoralists, especially during the dry season, which enabled the community to live harmoniously.

Even though a national carbon payment distribution mechanism had not been created, some communities participated in the piloting of REDD+ program. The payments were

centrally collected and distributed directly to the eligible local actors through existing regional and local government systems, thus reducing their transaction costs. The payments were both in monetary and non-monetary benefits shared among villages and other actors outside of the REDD+ projects' boundaries, such as when other villages members are involved in a communal *ngitili*. However, continuous monitoring, learning and impact evaluation of the project's effectiveness and adaptation are necessary to capture the additional benefits that come with restoration efforts, such as carbon sequestration and increased biodiversity.

4.2.3. Incentives Are Essential and Need to Be Enhanced

Community-based landscape restoration initiatives have long been viewed to significantly enhance the living conditions of communities; examples include joint forest management in Ethiopia and India; leasehold forestry in Nepal; community-based forest management in the Philippines, Cameroon, Ghana and Uganda; participatory forest management in Malawi, South Africa and Rwanda; and village forest reserves in Zambia and Tanzania [40,41]; *ngitilis* are no exception. However, Shinyanga's case stands out because of the existence of the practices despite the withdrawal of the HASHI program. The continuous motivation attributed to the direct and indirect benefits accrued from profitable gains, incentives and understanding of the importance of restoration and conservation by all of the actors.

The Shinyanga communities received incentives and considered these important, such as tree seedlings, direct funding, technical support and the possibility of receiving REDD+ payments in some of the communities, which incentivized the establishment of *ngitilis*. Other coercive measures (disincentives) such as sanctions and fines for non-compliance with the agreed-upon conditions and protective measures, e.g., the closure of unnecessary roads across the *ngitilis*, reduced the further degradation of the restored areas and stimulated the restoration process [36]. However, communities involved in the pilot REDD+ scheme received payments earlier in the project, and the expectation of receiving more carbon payments propelled the greater involvement of other villagers who did not own a *ngitili*, leading to the growth of these areas. The REDD+ pilot payouts were defined for short-term contracts with communities, but no long-term financing was planned. However, non-beneficiaries from these payments felt short-changed, while some beneficiaries were still expecting payments even after the pilots ended, causing some to abandon private *ngitilis* to other land uses after some time. Thus, it is important to note, even though the external incentives were necessary to propel the restoration process, these need to be implemented with care not to create an undue expectation [36].

In this case, land tenure was also an incentive for investment, and was envisioned for economic growth. Notably, land acquisition has increased, and trees on the farm increased in land value. The rights to the products from restored areas can create a variety of new income streams, including the sales of sustainably harvested firewood and timber. HASHI focused on indigenous agroforestry trees that were economically viable, offering multiple benefits such as food, medicine, fodder, construction material, fuelwood, and others. The communities preferred to have diverse tree species, including exotic species which were suitable for the area at the start of their *ngitilis* due to the assumption that most have a shorter growth period and other additional benefits. Fruit and nut trees, such as mangoes, oranges, sweet/sour soup (*Annona* spp.) and cashew, which are beneficial nutritionally and economically, were the top choices. Furthermore, education on more productive systems such as climate-smart agriculture and the integration of more timber and fodder trees within the *ngitili* areas were endorsed. Some challenges, such as limited market access and the branding of products such as honey, beeswax and resin obtained from the restored *ngitilis* areas, are still seen as a continual strain to their livelihoods. Thus, providing these linkages and enhancing these incentives may provide an additional incentive for more significant restoration.

4.2.4. Performance and Accountability Instruments Need to Have Been in Place

In the 1980s, the Tanzanian government, like many African governments, implemented local government decentralization and more democratic reforms by making them responsive and accountable to local needs and ambitions. In many places, this was through the decentralization of natural resource governance to local administrations [24,34,42]. For forest resources, decision-making powers on restoration were allocated to communities so as to be responsive to the local context. By bringing the community into forest governance, the decision-making process was expected to increase the resource management efficiency and increase the security of rights, translating into more direct livelihood benefits from the restored areas to communities [38,43,44]. In exchange for assigning power to the village governments that elect representatives, community members acquired the right to scrutinize the allocation of funds and whether they were consistent with customary laws and other legal requirements related to the management of *ngitilis*, such as how well they were managed and whether the initiatives achieve the intended results.

The capacity built through the restoration process enabled the village government to develop a rotational timetable and buying rights for grazing areas, and to decide how they were to be allocated. With registered individual land rights recognized by informal and formal institutions, governance in the restoration was perceived to be more efficient. At the same time, the increase in tenure security within the region was attributed to secure customary rights to the community forests (*ngitilis*), which have grown over time, and this has been an incentive for continued restoration efforts. This was formed because early attempts at tree planting mostly failed, as they lacked local ownership, were top-down in execution, and policies encouraged forest degradation. Over time, this started to change, being replaced by supportive policies that transformed degradation demand and pressures to the environment into incentives to restore it [18]. The performance and accountability instruments, and access to and control over resources stimulated and increased the community's willingness to restore and manage sustainably.

However, a ministerial directive in 2017 gave rise to fears that communities would lose these restored lands to the government. This was due to the suggested shift in the management of *ngitilis* in declining or not in good condition from local communities to the state, under TFS. There were concerns that people would lose their ownership rights of the communal *ngitilis* if they surrendered them to the state; several communities have begun the process. How and when the process of the surrender of the *ngitilis* will end is still unclear. Despite the government's commitment to the decentralization and devolution of decision-making on natural resources being high in the 1980s, this recently changed and is perceived as a set back to the devolution agenda. A dilemma is growing, and distrust from the communities who are involved with *ngitilis* is rising. Initially, the tenure reform was driven by observed shortcomings in centralized natural resource governance regarding effectiveness and equity. Thus, the villagization of these restoration areas was to promote the recognition of the communities' rights. Despite achieving success in the restoration process, the new directive is viewed as an impediment to restoration, and communities now fear their reservations are becoming a reality. To some extent, this has demoralized some communities, especially in the management of the communal *ngitilis*.

4.2.5. Consistent Long-Term Financing and Investments and Continuous Locally Relevant Technical Support for Communities Are Necessary

The success of the restoration by *ngitili* in Shinyanga facilitated long-term investments by financing agencies and long-term commitment by local and external actors. NORAD committed itself to supporting the HASHI program beyond the project's termination by building the capacities of local institutions and infrastructures, and ICRAF provided technical support. The local government and national government, NAFRAC, and later TFS, took over the monitoring and technical support for the restoration communities [45]. Thus, the local and national government become relevant drivers for the investment supporting the direct implementation of restoration. The village governments' coordination

ensured that many of the actors involved were not duplicating activities. This prioritization of local strategies and practices, and their responsiveness to the community needs and vulnerabilities ensured that the impacts were continuous. This comprehensive approach ensured long-term payoffs and community buy-in beyond the program's termination, and thus became self-sustaining.

5. Conclusions

The Shinyanga landscape has gained significant vegetation cover from restoration efforts over the last thirty years, building a thriving natural resource base in a landscape that had depleted most of its pastureland. Overall, Shinyanga demonstrates good prospects for the use of good governance to achieve democracy in the management of landscapes through multi-actor processes while delivering on fairness and long-term restoration goals. The restoration process was decentralized into the local authority domain and the community, forming an essential part of it, making it possible to move towards landscape democracy. This process involved many internal and external actors who had a common goal and shared vision, which aligned with the local contexts, preferences and community priorities. The Shinyanga community trusted the actors involved, primarily because they respected their local knowledge and built on their existing traditional systems. The governance structure recognized both formal and informal institutions, and how they interacted, increasing cohesion and synergies among the different actors. It also provides a potential pathway for improving the effectiveness and efficiency in landscape restoration processes, producing a more nuanced depiction of diverse values in society, and capturing heterogeneity in restoration. By building on existing governance structures, this has the potential to be scaled. The benefit-sharing mechanisms were adopted to share the costs and the benefits communally; no quotas were imposed on who participated and how, and rights, values and priorities were recognized for diverse groups. In the process, this democratized the landscape management by initiating independent multi-actor processes while delivering on fairness and sustainable restoration. This shows that governance systems must be consciously designed to deliver fairness and poverty alleviation for enhancing sustainable restoration. Over time, however, several *ngitilis* declined due to urban growth and competing economic activities within the area; while the lessons for democratization are useful and necessary, questions of the viability of the restoration over competing economic interests remain. Hence, supporting sustainable economic activities from nature-based resources as well as the value addition of nature-based outputs is expected to strongly motivate rural community members' to continue with the restoration. Shinyanga's restoration continued long after the end of the HASHI program due to the direct and indirect benefits accrued from the profitable gains, incentives and understanding of the importance of restoration by the community. Conservation benefits such as the ease of access to fuelwood and building materials, among others, and incentives such as the increase in tenure security at an individual and community level, the integration of agroforestry trees—which provided economic gains and other multiple benefits—and payments from REDD+ empowered the community to take up restoration activities. The change of policies was also instrumental in the successful restoration. Similarly, through the right to scrutinize the allocation of funds by the local authorities to the management of the *ngitilis*, the community members collectively were able to determine and question how the restoration was managed and whether it achieved the intended results. Performance and accountability instruments and the various incentives were essential to propel the restoration process; however, external incentives need to be implemented with care not to create an undue expectation. Additionally, long-term and consistent financing and investments are necessary for sustainable restoration.

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Appendix A

Table A1. Actor roles in the restoration of the Shinyanga landscape.

Stakeholders	Roles of Actors in Ngitili Management
	Governmental institutions
National government—the Ministry of Environment and Natural Resources	Facilitated the HASHI program implementation process at the national level—provided guidance and education
Tanzania Forest Service Agency (TFS)	A semi-autonomous government agency in charge of conservation, development, and utilization of forest resources. It promotes and provides district forest and natural resource management experts to oversee in tree nursery management and training on tree management to communities
National Forest Resources and Agroforestry Management Centre (NAFRAC).	Worked with local communities, supporting them with the planning of environmental conservation project activities. Implemented the project after HASHI's completion at the regional level, and provided tree seedlings
Tanzania Forestry Research Institute (TAFORI)	Conduct, coordinate forestry research as well as ensure the documentation and dissemination of <i>ngitili</i> results for sustainable forest management
Agricultural extension officers	Directly worked with communities and informed farmers to better decisions to increase agricultural production within <i>ngitili</i> areas. In some areas-initiated conservation and restoration activities as in Busongo village
Local district authorities led by the ward executive officer, WEO, village executive officer VEO Police and judiciary	Facilitated project implementation and approval of village by-laws, maintaining law and order, administrative duties Enforce the law and assist in conflict resolution

Table A1. Cont.

Stakeholders	Roles of Actors in Ngitili Management
Community/ village-based institutions	
Village government	Provide linkages between the local community and formal institutions at district and national levels, project implementers, and other stakeholders. Also sets and enforces village by-laws; issue fines and permits for illegalities
Village committees such as environmental, land, and <i>wazee wa zengwa</i> , <i>baraza la wazee</i> (village elder) committees; Local councilors (<i>Diwani</i>)	Address natural resource conflicts, and provide education on social welfare including health, education, nutrition, land, water, and environmental conservation
Village guards	<i>Mgambo/mlinzi</i> protect and make arrests those who destroy the <i>ngitilis</i> <i>Sungusungu</i> law enforcement and apprehending offenders in the village
Primary and Secondary schools	Provide education to children on restoration and conservation matters
Religious organizations (churches, mosques) Hospitals and dispensaries	Advocate and provide education on conservation of trees, conflict resolution, advocate for peace
Communities/ Private <i>ngitili</i> owners/ Private benefactors/ youth and women groups	Voluntary establishment, management, and protection of <i>ngitilis</i>
Non-governmental institutions	
Tanganyika Christian Refugee Service (TCRS)	Advocated for behavioral change, and provided training on tree management, drip irrigation, and water purification methods, established nurseries and supplied tree seedlings, provided water pipes, water storage units, energy-saving, and improved cookstoves
OXFAM	Introduced sisal plantation within <i>Ngitilis</i> and engages youth in restoration agenda
Tanzania Social Action Fund (TASAF)	Enable poor households to increase incomes and opportunities while improving consumption. Some of the funds go towards restoration and conservation activities
World Agroforestry (ICRAF)	Provided technical support to the HASHI project from planning to the implementation phase
Tanzania Traditional Energy Development and Environment Organisation (TATEDO)	Implementing REDD+ pilot projects within <i>Ngitili</i> areas in the Shinyanga region. Furthermore, introduced biogas as an alternative source of energy, and trained communities on restoration and conservation
Development Associates Ltd. (DASS)	Involved local communities in exploring how the communities were to benefit from through Reducing Emissions from Deforestation and Forest Degradation (REDD+) schemes
CARE International	Involved in education, health, microfinance, and environmental programs within the villages
Jumuita	Local NGO that is involved in greening the landscape through indigenous trees provides training and seedlings to the school
Farm Concern	Improved farming methods and conservation agriculture
AMREF	Provide training to youth and tree seedlings to be used in <i>ngitilis</i>
Acacia Buzwagi benefactors	Employ local communities to the primary gold mine
BioRe Tanzania	Provide training to the youth and incentive the integration of cotton in the <i>ngitili</i> areas
Norwegian Agency for Development Cooperation (NORAD)	Funded the HASHI project

Table A2. Community perceptions of the crucial actors missing from the restoration process in their villages. The highlights represent those missing.

Identified Missing Actors in Restoration in the Villages	FGD Villages in Shinyanga													
	Ndololeji	Busongo	Ikonda A	Bubinza	Magalata	Ngulu	Bukwangu	Kilago	Mwendakulima	Manyada	Mwambiti	Mwamishali	Bomani	Mwambegwa
Agricultural extension, and Forest officers														
Traditional healers/ medicine men/women														
Women groups														
Youth groups														
Judiciary (law court)														
Livestock herders/ pastoralists														
Religious institutions														
Actors within the timber trade														
Actors within the charcoal trade														
Local councilors														
NGOs with ongoing projects in the villages														
Police														
Schools														
Small-scale gold miners														
Electricity Supply Company and water companies														
Village land committees														
Buyers of REDD credits														
Health institutions														
Member of Parliament														

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