



INITIATIVE ON
West and Central African
Food Systems Transformation



Gender Equality and Social Inclusion in Landscape Management: The Case of Nyamasheke and Rusizi Districts in Rwanda

Likimyelesh Nigussie, Charity Osei-Amponsah, Liberata Muhorakeye, Diane Uwanyirigira, Seifu Tilahun, Gerald Atampugre, Olufunke Cofie



Authors' affiliations

Likimyelesh Nigussie, International Water Management Institute (IWMI), Addis Ababa, Ethiopia
Charity Osei-Amponsah, IWMI, Accra, Ghana
Liberata Muhorakeye, Rwanda Water Resources Board (RWB), Kigali, Rwanda
Diane Uwanyirigira, RWB, Kigali, Rwanda
Seifu Tilahun, IWMI, Accra, Ghana
Gerald Atampugre, IWMI, Accra, Ghana
Olufunke Cofie, IWMI, Accra, Ghana

Acknowledgement

We would like to thank all the funders who support this research through their contributions to the [CGIAR Trust Fund](#). In addition, we would like to extend our sincere gratitude to the Rwandan Ministry of Environment for their assistance towards the success of this work. The authors also acknowledge the invaluable contributions of all participants, especially officials from the [Rwanda Water Resource Board \(RWB\)](#) who implemented the study on behalf of the [International Water Management Institute \(IWMI\)](#).

Suggested citation

Nigussie, L.; Osei-Amponsah, C.; Muhorakeye, L.; Uwanyirigira, D.; Tilahun, S.; Atampugre, G.; Cofie, O. 2024. *Gender equality and social inclusion in landscape management: the case of Nyamasheke and Rusizi districts in Rwanda*. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Initiative on West and Central African Food Systems Transformation. 26p.

CGIAR Initiative on West and Central Africa Agri-Food Systems Transformation

This publication is an output of the CGIAR Research Initiative on [West and Central African Food Systems Transformation](#) (TAFS-WCA). TAFS-WCA aims to help realize the potential of agriculture to improve nutrition and food security by developing nutritious, climate-adapted, and market-driven food systems.

To learn more about TAFS-WCA and other initiatives in the [CGIAR](#) research portfolio, please visit <https://www.cgiar.org/research/cgiar-portfolio/>.

Disclaimer

This work was carried out by the [International Water Management Institute \(IWMI\)](#) as part of the [CGIAR Initiative on West and Central African Food Systems Transformation](#) (TAFS-WCA) and has not been independently peer reviewed. Responsibility for editing, proofreading, and layout, opinions expressed, and any possible errors lies with the authors and not the institutions involved. The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by IWMI, CGIAR, our partner institutions, or donors.

Contents

- Summary4
- Introduction.....5
- Methodology6
 - Research case6
 - Analytical framework7
 - Study area7
 - Data collection8
 - Data analysis9
- Results9
 - Impacts of gender identities and intersectional issues on individuals relationship with the environment*9
 - Impacts of gender identities and intersectional issues on resource rights*11
 - Impacts of gender identities and intersectional issues on knowledge and skill transfer*15
 - Impacts of gender identities and intersectional issues on participation and voice*16
- Discussion20
- Conclusion and practical implications22
- References.....24

Summary

Gender Equality and Social Inclusion in agriculture and natural resource management is crucial for addressing climate change and land degradation. In Rwanda, laws and policies support gender equality and environmental sustainability. Despite efforts to involve both genders in decision-making, power dynamics persist, impacting landscape management priorities, knowledge valuation, resource rights, benefits distribution, and decision processes. This study investigates the interplay between gender and multiple identities, including marital status, socioeconomic status, and age, alongside power dynamics. It emphasizes how these factors affect rights to resources, the transfer of knowledge and skills, and the impact on participation in decision-making processes which are essential for effective landscape management in the Rubyiro Sub-Catchment located in Rwanda's Rusizi and Nyamasheke districts. It is a qualitative study based on data gathered in May and June 2024 using eight key informant interviews (four men and four women), 20 household interviews (ten men and ten women), and eight focus group discussions (four with men groups and four with women groups). The results suggest that the Government of Rwanda has put in place legal frameworks to advance environmental sustainability, gender equality, and sustainable development. However, the experiences of farmers, regardless of gender, highlight that age, gender, socio-economic conditions, and power relations significantly impact their rights to resources, their capacity to voice opinions, and their representation in landscape management, thereby affecting its effectiveness. The following are the three primary key results and recommendations.

- The study reveals that both genders, particularly younger men, and women from resource-poor households, face limited access to resources like land, water, and financial support due to poverty and patriarchal cultures. This leads to unsustainable practices, limited economic opportunities, and limited eco-friendly livelihoods. Addressing these challenges requires interventions that focus on the needs, priorities, barriers, and challenges of the diverse social groups, and ensure access to resources and services, and benefits.
- Male heads in households often control information, creating a gender and generational gap in ecological knowledge. Gender disparities in priorities and knowledge also exist in landscape management, with women prioritizing adaptive strategies for food security and men prioritizing economic gains over sustainability. To effectively address the gender gaps in ecological knowledge in the context of landscape management, it is vital to pursue inclusive educational and communication strategies. This includes organizing community workshops that cater to men and women from diverse social group, focusing on the food security priorities of women, and creating platforms for dialogue across generations. Moreover, it is necessary to establish gender-sensitive policies and harness technology to facilitate the broad dissemination of information.
- The research also reveals significant differences in leadership roles and decision-making between men and women, due to patriarchal norms and economic challenges. Women are underrepresented in conservation decision-making due to domestic duties and poverty, further marginalizing their voices. Limited involvement of women, men, and youth from diverse social groups in landscape management decision-making processes perpetuates cycles of poverty and poor resource use. We recommend adopting interventions that address the barriers to enhance equitable participation in leadership positions, while promoting gender-sensitive practices and fostering collaboration.

Introduction

Landscape management initiatives encompass comprehensive strategies designed to promote sustainable development while tackling complex environmental and social issues (Denier et al. 2015). These initiatives aim to achieve various goals, including the preservation of ecosystem services, protection of biodiversity, enhancement of rural development, and improvement of human well-being (Axelsson and Angelstam 2011). The integration of Gender Equality and Social Inclusion (GESI) is essential in landscape management, ensuring that the results are inclusive, fair, and sustainable. By incorporating GESI into landscape management practices, it is possible to create job opportunities, improve rural livelihoods, and address issues such as ambiguous land tenure (Singh et al. 2021). However, challenges related to GESI remain a significant global issue (Massey et al. 2018), despite existing policy commitments (Lau 2020). Among other, scarcity of gender-disaggregated data and research on the specific roles, needs, and contributions of women and marginalized groups in landscape management to inform decision-making and policy formulation (Kristjanson et al. 2019) is reason for GESI gaps in landscape management.

In Africa, women are pivotal in the management of natural resources, including water, agriculture, livestock, forestry, and fisheries (Botaro and Mulugeta 2020), yet they frequently encounter exclusion and unequal distribution of benefits due to societal and cultural norms (Akinola 2018). Women frequently face a lack of land ownership rights and are often excluded from decision-making processes (Tantoh et al. 2021). Those from low-income backgrounds encounter societal obstacles that impede their ability to obtain the land rights essential for engaging in agriculture and landscape management (Treidl 2018). Fonjong and Zama (2023) also pointed out that climate change creates difficulties in accessing natural resources like water, which significantly affects women's capacity to fulfill their dual roles as farmers and household managers. For instance, Seri (2023) notes that water scarcity disproportionately burdens women by increasing the time and distance required to collect water, leading to socio-economic challenges and health risks. Additionally, financial constraints often force both men and women from marginalized communities to depend on short-term, unsustainable practices, which perpetuates poverty and restricts opportunities for environmentally sustainable livelihoods (Liu et al. 2021).

The male leadership in natural resource management organizations restricts women's ability to influence decisions and neglects their unique perspectives (James et al. 2021). Women, particularly those in rural areas, often hold essential insights into the use of household water, conservation strategies, and sustainable practices that can improve water management efforts (Seri 2023). However, women participate significantly less in conservation decision-making forums due to several factors including domestic duties, poverty, and time constraints (Baral et al. 2024). Research also shows significant gender gaps in landscape management, with women often having different knowledge, roles, and interests but receiving little technical or financial support (Kristjanson et al. 2019). Young people in Africa are also key players managing natural resources, contributing to sustainable development and collaborative resource management (Musavengane et al. 2019). However, young people's ability to participate in and benefit from landscape management in Sub-Saharan Africa is challenged by limited access to resources, and inadequate participatory and inclusive accountability processes (Ibid). The limited engagement of diverse social groups in

landscape and natural resource management can result in inefficient resource utilization and disjointed efforts (Mairomi and Kimengsi 2021).

The CGIAR Initiative on West and Central African Food Systems Transformation is committed to enhancing nutrition and food security in Rwanda, particularly in the face of climate change challenges. This initiative is structured into five work packages, with Work Package 3 (WP3), spearheaded by IWMI, focusing on inclusive landscape management (ILM). WP3's mission is to ensure equitable access to land and water resources, thereby cultivating a healthy environment that supports resilient agrifood systems. As part of work package three, this research explores the relationship between gender and various identities, such as marital status, wealth, and age, in conjunction with power dynamics. The focus is on how these elements shape resource rights, knowledge and skill transfer and influence participation in decision-making processes that are critical for effective landscape management in the Rubyiro Sub-Catchment of Rwanda's Rusizi and Nyamasheke districts. The following questions were explored in the study to achieve the objectives:

- What are the main gender identities and intersectional issues of landscape management in the Rubyiro Sub-Catchment in Rusizi and Nyamasheke districts in Rwanda?
- How do gender identities and intersections influence power dynamics and decision-making processes of landscape management; and what are the implications for resource rights, knowledge and skill transfer, and participation and voice?
- What are the systemic issues that contribute to exclusions of gender identities and intersections in policies and practices that support landscape management in Rwanda?

This report presents a comprehensive methodology that includes the research case, an analytical framework, the study locations, and the techniques employed for data collection and analysis.

The results highlighting the determinants influencing gendered livelihood activities, farming practices, and the distribution of environmental rights between men and women across different social groups. Following this, we engage in a discussion that relates our findings to other relevant studies. In conclusion, we offer practical recommendations for advancing gender-responsive and socially inclusive landscape management in the two districts of Rwanda.

Methodology

Research case

Rwanda faces significant gender and social inclusion challenges in landscape management. Although the government has made strides toward promoting gender equality and sustainable land practices, obstacles to fully benefiting from the efforts remain. Women, particularly single mothers, and those from low-income households, find it difficult to obtain land rights and actively participate in agricultural development due to societal barriers (Treidl 2018). Additionally, farms managed by women often do not achieve high levels of cultivation, primarily due limited involvement in decision-making processes that often overlook their voices and suggestions (Umuziranenge 2019). The government's focus on modernizing agriculture and large-scale production may inadvertently exclude vulnerable groups including women (Treidl 2018; Umuziranenge 2019). Youth participation in landscape management decision-making in Rwanda is hindered by cultural norms favoring older generations (Brown 2021). Limited access to resources like information, finance, and seedlings impedes farmers' involvement in restoration efforts (Buckingham 2020; Kiyani et al. 2017).

Analytical framework

To explore the research questions, we utilize the Feminist Political Ecology (FPE) framework. This framework merges feminist theory with political ecology to examine the complex relationships among gender, power dynamics, and environmental challenges (Sundberg 2017). FPE underscores the necessity of incorporating gender perspectives into all facets of ecological issues, extending beyond merely social aspects (Zaremba et al. 2021). Fundamental principles of FPE include the analysis of intersectional vulnerabilities (Nunbogu and Elliott 2021), the integration of diverse perspectives, values, and localized knowledge (Elias et al. 2021), and the prioritization of marginalized voices within environmental governance (Zaremba et al. 2021). This approach critiques dominant narratives and advocates for more inclusive and contextually relevant strategies in environmental initiatives (Elias et al. 2021). Additionally, FPE challenges the commodification of nature and emphasizes the necessity of addressing systemic inequalities within environmental policies and practices (Ibid). Consequently, FPE provides an essential framework for conducting gender analysis within landscape management by enabling a thorough investigation of :

- the experiences, challenges, and opportunities faced by women in the context of climate change (Harcourt 2020),
- the roles and viewpoints in the governance of natural resources (Manoby et al. 2023), and
- the access to, control over, and understanding of natural resources (Sundberg, 2017),
- decision-making processes and the development of subjectivities in agricultural practices (Spangler and Christie 2020) as well as in resource management (Nyantakyi-Frimpong 2019), and

We used the framework to analyze impacts of gender identities and intersectional issues on unique relationship individual men and women have with landscape, rights to resources, knowledge, and skill transfer, as well as their participation and voice in decision making in landscape management.

Study area

The research was conducted in two districts within the Rubyiro Sub-Catchment, specifically in the Nzahaha sector of Rusizi and the Karengera sector of Nyamasheke, both located in Rwanda. Rusizi and Nyamasheke are part of the seven districts that comprise the Western Province (Figure 1).



Figure 1 Map of Rwanda with districts ¹

Positioned in the southeast of Rwanda, Rusizi shares its southern borders with Burundi and the Democratic Republic of Congo, while it is flanked by Nyamasheke and Nyamagabe to the north and Nyamagabe and Nyaruguru to the east. In contrast, Nyamasheke district is bordered to the north by Karongi District, to the south by Rusizi District, to the east by Nyamagabe District from the Southern Province, and to the west by the Democratic Republic of Congo.

Data collection

The study used qualitative research methodology to explore how gender, power dynamics and social hierarchies impact access to land and resources, as well as participation in decision-making processes in landscape management initiatives in the Rubyi Sub-Catchment of Rwanda. Secondary sources were consulted to select the analytical framework and understand gender equality and social inclusion in landscape management. Primary data was collected through household interviews, Focus Group Discussions (FGDs), and Key Informant Interviews (KIIs) using semi-structured questionnaires and checklist questions. Data was collected in May and June 2024, with efforts to ensure diversity among the 92 informants, including men and women of various ages, income levels, marital statuses, geographic locations, and household structures. Details on informant selection and participant demographics are presented below.

Household In-depth Interviews: A total 20 individuals were reached through the in-depth interview from the two districts. The composition of informants was ten individuals per district (five women, five men) and these were drawn from five better-off and five resource-poor households. Each wealth category selected from a kebele consists of the following age and sex groups i.e., one female spouse, one female household head, one young woman, one adult men, and one young man. Men and women from better off households in the context of this study refers to those who own large land size, house, cattle, or business; and, those who are able to employ others in their ventures. On the other hand, men and women from resource poor households are those who live in houses with poor

¹ Maps Rwanda (2024) <https://maps-rwanda.com/rwanda-map-with-districts#&gid=1&pid=1> Accessed date 21/7/2024

conditions, who are landless or own small plot of land, own only small livestock, and usually work as casual labor.

Focus Group Discussions (FGDs): Participants in the FGD included 64 individuals drawn from two districts. The informants in each district were stratified into two wealth classes: better-off households and resource-poor households. Each wealth class was further divided into two sub-groups: female-only groups and male-only groups, with each focus group discussion consisting of eight informants. This resulted in a total of 32 informants from each village. Semi-structured questionnaires guided the household interviews and focus group discussions, emphasizing key livelihood activities, knowledge of farming techniques, experiences with environmental changes, access to resources, agency, and representation in landscape management decision-making processes.

Key informant interviews: The total number of key informants interviewed was eight. The informants represented different sectors, including: (a) Vice mayor social affairs (2); (b) Gender and family promotion (2); (c) Land administration officer; (d) Forest and natural resources, (e) Sector agronomist; f) Agriculture inspector. The key informant interviews were conducted to explore challenges within a district, perceptions of gendered knowledge, resource accessibility, agency, gendered environmental rights, and the effects of formal and informal rules on environmental rights.

Data analysis

All focus group discussions, household interviews, and key informant interviews, except for two conducted in English, were conducted in *Kinyarwanda* (national language of Rwanda). The sessions were recorded, transcribed, translated into English, and subsequently analyzed. The study employed coding and content analysis (Krippendorff 2018) to conduct a comprehensive examination the primary qualitative data. The analysis highlighted and explored the effects of gender identities and intersectional issues across four key themes: relationship with the landscape, resource rights, knowledge and skill transfer, and participation and voice. In examining the relationship with the landscape, we investigated the distinct connections that men and women have with their environment, particularly in the context of climate change and environmental degradation. Regarding resource rights, we assessed how access to and control over essential resources such as land, water, and financial assets influence participation in landscape management and the equitable distribution of benefits. Additionally, we explored the effects of gender identities and intersectional issues on the transfer of knowledge and skills related to landscape management. Finally, the study analyzed how these gender identities and intersectional issues affect the participation and voice of men and women in landscape management platforms.

Results

This section highlights the determinants influencing gendered livelihood activities, farming practices, and the distribution of environmental rights between men and women across different social groups.

Impacts of gender identities and intersectional issues on individuals' relationship with the environment

In this section we discuss how gender identities and intersectional issues shape landscape management. Specifically, we discuss the unique relationships men and women from diverse social

groups have with landscape, especially in agricultural and rural environments, where they hold specific responsibilities for household income, food security, and resource management.

Our research indicates the predominant livelihood activities for both men and women in the Kagano sector of Nyamasheke district and the Nzahaha sector of Rusizi district, revolve around subsistence mixed crop-livestock production systems that rely on rainfall and natural resources. We also found there are notable differences in the preferences and levels of involvement in various livelihood activities between men and women in the studied areas. Women across various socio-economic backgrounds are primarily responsible for ensuring their family's food security. Hence, they are dominantly engaged in growing staple crops like beans, maize, cassava, and potatoes. These crops typically offer lower income potential, as they are usually produced for consumption, within the duration for rented lands. A young married woman from a resource poor household illustrated this as *“I do not own farmland; instead, I rent land, paying 15,000 RWF (USD 11) per year. The crops I enjoy growing are beans, maize, and sweet potatoes. I prefer these crops because, when renting land, it is important to choose those that mature quickly, allowing me to harvest and provide food for my children.”* Additionally, women tend to raise small livestock, including goats, pigs, chickens, and panya, which are affordable and require minimal upkeep, thereby addressing their families' immediate nutritional and basic economic needs. A woman FGD participant from better off households of the Nyamasheke district indicated that: *“Women often raise small livestock that requires minimal financial investment and energy, such as pigs, chickens, goats, sheep, and rats (known as panya). These animals provide organic manure and contribute to alleviating poverty within the household.”* Women across various economic backgrounds also participate in small-scale businesses, such as selling fruits and vegetables. Furthermore, women from economically disadvantaged and landless households, except for those who are pregnant, ill, or nursing, often engage in wage labor, primarily in domestic roles and manual work.

In contrast, men are dominantly engaged in agricultural activities that require significant investment and offer higher financial returns, such as the cultivation of high-value crops, fruits, vegetables, livestock farming, and timber sales.

“Men prefer to grow fruit trees, passion plants, and legume crops such as tomatoes and eggplants because these crops yield higher income. Additionally, these activities often require physical strength, such as carrying a sprayer pump to apply chemicals for pest and disease control. This can be difficult for women, as they typically carry babies.”

Female FGD participants from better off households from Nyamasheke district

Additionally, men from resource-poor and landless households frequently pursue wage employment activities such as charcoal production, quarrying, and agricultural labor during the rainy season.

Both men and women participants from the districts have identified a range of environmental challenges that significantly affect their livelihoods and overall quality of life. These challenges encompass land degradation, erosion, landslides, and a reduction in soil fertility. They noted that environmental degradation is influenced by several factors, including extensive land use prompted by population growth, overgrazing, and the pursuit of economic benefits from livelihood activities

that often neglect environmental sustainability, particularly among men. The participants cited specific practices contributing to this degradation, such as the burning of unusable grasses and the deforestation for timber, charcoal, and firewood, in addition to mining and overfishing. Moreover, they highlighted the difficulties posed by climate change, including erratic rainfall patterns, increasing temperatures, droughts, and the rise of plant diseases and pests, all of which negatively impact their natural resources—such as water, land, and forests—and hence their agricultural productivity and income. A resource poor young woman from Rusuzi district explained the challenges due to climate change as:

“There is a change in precipitation patterns; currently, precipitation is arriving either ahead of or behind the forecasted periods. Additionally, there are instances when precipitation stops prematurely. All these changes impact the harvest. For example, some farmers plant their crops in the valley, intending to grow them during the rainy season. They hope that when the rain stops, they will have a few months left for harvesting, during which time they can irrigate the crops. However, if the rains stop prematurely, it negatively affects the harvest.”

Our results show impacts of land degradation and climate change varies for men and women from the different social groups. Women are significantly impacted by environmental challenges due to their roles in staple crop production, family food security, and maintaining water security. For instance, when women from economically disadvantaged families, with limited opportunities to diversify livelihoods are faced with loss of harvest and income from staple crop, which affects their economic stability and has a significant implication on their children such as stunting, school dropout, and trauma. Unlike women, men have better prospects for diversifying their livelihoods or migrating if farming fails, due to the gender division of labour.

Men and women study participants indicated they collaborate with local authorities and stakeholders to tackle issues related to environmental degradation and the effects of climate change. These efforts include initiatives focused on soil and water conservation, agroforestry practices, and covering crops and vegetables for enhancing water retention. They also indicated their participation in the construction of terraces, establishment of contour lines, and the planting of vegetation to mitigate erosion. Additionally, they implement rainwater harvesting methods, which involve the construction of dams and the collection of rainwater from rooftops for various applications. They also protect water sources by planting bamboo around rivers and streams and avoid farming in buffer zones. However, the effectiveness of these efforts is challenged by disparities in resource rights, valuation of knowledge, and benefit sharing. The following section discusses how the interplay between identities and intersection with power dynamics influence resource rights, participation, and voice in the context of landscape management in the two districts.

Impacts of gender identities and intersectional issues on resource rights

This section explores how the interplay between gender identities, intersectional issues, and power dynamics impacts access to and control over resources such as land, water, and finance, thereby influencing the success of landscape management initiatives.

Access to and control over land – Men and women participants indicated that land is government-owned, yet they possess rights to use it. The land rights are obtained through inheritance, family gifts,

and market transactions including purchases and rentals through cash payment or sharecropping arrangement. They noted that land fragmentation has made it increasingly difficult for young men and women to obtain land from family members through inheritance or gifting, often resulting in limited parcel sizes or landlessness. The small size of landholdings frequently gives rise to conflicts between spouses concerning their preferred crop types for cultivation. Typically, men favor cultivating high-value crops, while women are more inclined towards growing staple crops. Consequently, since men are often regarded as the heads of the household, they hold the ultimate decision-making power regarding crop production including what crop to grow, which frequently results in the neglect of women's preferences. An FGD participant from better off household in Rusizi district explained this as:

“Farming on small land size necessitates planting different crops. This situation can lead to conflict between husbands and wives, as each may prefer different options. For instance, I once chose to plant maize while my wife decided to plant cassava. Our wives want to ensure we have a variety of food items to eat at home.”

The problem of small land size is particularly pronounced for young women, as sociocultural norms often favour young men in inheriting larger plots of land compared to what young women receive. A female FGD participant from better off households in Nyamasheke district explained that: *“In matters of inheritance, all children receive their shares; however, boys typically receive a larger portion compared to girls.”* Acquiring land from the market is also challenging for men and women from resource poor households, due to prohibitive costs. Furthermore, landowners often demand a minimum rental agreement of two years to justify their substantial investments, exacerbating the difficulties faced by potential renters. A male participant in a focus group representing low-income households in the Nyamasheke district illustrated this as:

“The challenge of accessing land lies in the prohibitive costs associated with buying or renting it. For instance, renting land typically requires at least 100,000 RWF to 200,000 RWF (USD 75 to 150) ; without this amount, finding a rental becomes impossible. Landowners often prefer not to rent for less than two years, as they typically seek to generate additional income for investment purposes.”

Accessing and owning land from market are particularly pronounced for women and youth, who frequently encounter limited financial resources. Moreover, the high fees associated with land title transfers, combined with restricted access to financial support, further complicate the process of acquiring and owning land. A young woman from the Rusizi district described a case illustrating this as:

“My parents gave me land as a gift, but the title is still in their name because transferring titles is expensive. So, I had to include them in a loan agreement with a bank to use the land certificate as collateral for buying farm inputs. I am saving money to eventually complete the transfer.”

The limited authority women and young people possess over land significantly impacts landscape management, resulting in reduced agricultural productivity, perpetuating unequal resource distribution, contributing to environmental degradation, and reinforcing social inequalities.

Access to Water – Men and women study participants reported accessing water from a variety of sources for diverse purposes. Women from households with the financial means to cover connection fees and purchase jerry cans of water obtain water primarily from the Water and Sanitation Company (WASAC) for drinking and domestic use. However, the availability of water from this source is often restricted, particularly during dry seasons, where no water access from WASAC persists for weeks. In contrast, women from economically disadvantaged households, who are unable to afford the substantial connection fees, frequently collect water from alternative sources such as boreholes for domestic purposes. While the alternate sources do not incur direct financial costs, they demand considerable time and effort to access.

“WASAC provides a public tap water station located just five minutes from my home. Users pay 10 RWF (USD 0.01) for one jerrican, which holds approximately 30 liters. When I have the funds, I prefer to use the WASAC tap for water. However, since I often cannot afford it, I fetch water from a borehole for domestic use, which takes me about 40 minutes to reach.”

Young female household head from a resource poor household in Nyamasheke district

In times of drought, gathering water from these alternative sources becomes more challenging, for women and girls, because of lengthy queues due to the limited availability of water. Our results show accessing safe water from nearer sources, also partly depends on household power dynamics. A resource poor FGD male participant from Nyamasheke district said: *“...in the family where the couple has good relationship, the husband gives the money (if available) to the wife to purchase the water from public tap water but in the family where there is no good relationship, the woman has to go the borehole.”* Additionally, some farmers use river and valley water for irrigation during drought, but only a few uses effective irrigation methods.

The results show water resources in the Nyamasheke and Rusizi districts are overseen through a collaborative approach involving local authorities and community members, aimed at ensuring protection of water resource as well as equitable access and utilization. They protect several types of water sources through strict prevention measures such as planting vegetation around boreholes and rivers and avoiding farming in buffer zones. To protect the river passing through the field, the community avoids exploiting the area near the river and channels rainwater away from the houses. Users agree to accumulate water in a small dam to avoid conflicts and ensure fair water distribution instead of each landowner constructing their own dam.

Despite this collective effort, inequalities in access and participation in decision-making processes remain evident. Access to and utilization of water resources, particularly for irrigation purposes, is significantly hindered for both men and women due to factors such as topographical challenges and high pumping costs. Additionally, men engage in water resource management activities, including the organization of community contributions for the maintenance and operation of boreholes.

Access to and control over finance – Men and women study participants indicated they use various sources like earnings, savings, village saving and loan associations, financial institutions, and One

Acre Fund-TUBURA program ²for financing agriculture needs and growing their businesses. Both men and women participants noted that women have good access to loans from village saving and loan associations for acquiring agricultural inputs and technology. They also emphasized the difficulties encountered in obtaining financial resources, which arise from several factors including household power relations, the lack of customized financial services such as insufficient collateral and limited financial capacity.

At the household level, female partners usually have authority over staple crops that are intended for consumption and income through sales, while male partners typically control high-value crops, cows, and forest products, along with the income derived from them. Some men and women respondents indicated discussions between spouses concerning harvest allocation, income utilization, loans, and participation in savings and loan associations or cooperatives occur prior to reaching a decision, with male spouses typically serving as the final decision-makers.

“Once we have the income, we seat together and, we decide how to invest that money for example we can decide to extend our land, buying a cow, or to plant the forest. We decide also about the food and non-food items that are needed at home and we buy them. ---- The last word is given by myself, normally, I give the speech to my wife, and she gives her point and I conclude. Always she agrees with the last decision.”

Married adult man from a better off household in Nyamasheke district.

However, women focus group discussion participants on both districts indicated the level of access that women have from income earned by men is influenced by the dynamics of their marital relationships. In relationships characterized by respect and cooperation, decision-making regarding high-value crops and their sales tends to be a shared process. However, in less harmonious relationships, male partners often make decisions unilaterally. Women emphasized their crucial roles in identifying crop-related issues, exploring potential solutions, and conveying detailed information to their husbands, who make purchasing decisions. This limited control over income has significant implications for women's ability to purchase agricultural inputs and meet the needs of their households. A female spouse from resource poor household in Rusuzi district, who participated in a focus group discussion shared her experience as:

“I grow beans, corn, cassava, soybeans. I opt for crops that we can cultivate and support with our financial means. There are other crops I would like to plant, but they are expensive, and I do not have money. For example, planting legumes such as eggplant and cabbage is a viable business, but expensive because they require agricultural inputs.”

Men and women study participants from resource poor households also pointed out lack of collateral as a barrier for accessing finance. They indicated that while banks offer loans, they require collaterals, such as property or mortgages, which restricts their ability to obtain loans, especially from banks. Furthermore, financial institutions usually require individuals to maintain a minimum

² Acre Fund-TUBURA program is an agricultural development organization serving 600,000 farming families from 27 districts.

balance to open a bank account, which complicates their access to credit and limits their ability to secure productive resources like land and farming inputs.

Men and women, particularly from resource poor households and elderly ones, who have limited access to finance use various strategies to overcome financial access challenges including continuous use of traditional farming methods and their social capital. For example, a woman from a resource-poor household shared her experience of using traditional method as: *“When there are insects on the crops, I try to remove them manually. I also scare away birds from eating the beans by hanging scarecrows in the field.”* Women and men, with limited access to finance also use organic fertilizers like maize and bean byproducts or livestock manure when they cannot afford chemical fertilizers. Women study participants also indicated when facing financial constraints in hiring labour on the farm or when they have minimal support from family members in farming activities, they often turn to their friends for assistance. A young woman from Nymasheke district illustrated how women use their social networks and capital for mitigating the issue of limited access to finance as:

“For harvesting, my mother is sometimes supported by her friends. they are the neighbors, women of her age. These women support mutually in the agriculture activities because they do not have enough financial means to pay the casual workers.”

Additionally, both men and women from resource-poor households mentioned that they buy agricultural inputs from wealthier farmers who purchase them at a discount and sell them at a lower price to fellow farmers. This helps them cope with the soaring prices of chemical fertilizers.

“To purchase farm inputs, which are expensive on the market, I negotiate with a neighbor who buys in bulk. He gives me a small amount, like 1 kg, and I either pay him for it or work for him in the field in exchange for the fertilizer instead of cash. When purchasing a significant quantity, suppliers offer a reduced price, which means I benefit from the same discount. For example, I can save 200 Frw (USD 0.15), allowing me to obtain 20 jerricans of water from the public tap of WASAC.”

Young female household head from resource poor household in Nyamasheke district

Impacts of gender identities and intersectional issues on knowledge and skill transfer

This section explores the influence of gender and intersectional factors, as well as gendered power dynamics, on the transfer of knowledge and skills, which in turn affects the effectiveness of landscape management initiatives.

Both men and women, indicate that the effective utilization of modern agricultural inputs and practices necessitates access to information and advisory services, and finance. In the context of the study, both male and female participants draw upon a variety of information and advisory sources on modern agricultural inputs and practices from various sources. These include agronomists, community facilitators, Acre Fund-TUBURA program facilitators, firsthand experiences, social networks, and social media. The Rwanda Agriculture Board, along with agronomists, provides training focused on crop selection, planting techniques, and the management of natural resources to community facilitators. They also organize training sessions and facilitate exchange visits. *“In our*

administrative sector, there is an agronomist who trains community facilitator from each village on various agricultural topics like environmental protection, field preparation, crop types and planting methods. The facilitators then pass on this knowledge to farmers in their respective villages.” A male FGD participant from better off household in Rusuzi district.

Facilitators associated with the Acre Fund-TUBURA program are tasked with supplying agricultural inputs and imparting technological education to farmers, regardless of gender. However, access to these services is primarily held by community agricultural promoters, who are mostly male household heads, who then relay the information to their fellow men and women farmers in their locality, family members, including spouses who may have limited mobility due to their household responsibilities.

Both male and female farmers from various backgrounds indicated they also learn about agricultural practices and the management of natural resources through their own experiences, social interactions, and media exposure. Knowledge about agricultural practices and natural resource management are gendered. A key informant from Rusuzi district illustrated this as:

“Women, who often take charge of staple crop production, have more knowledge on it, which empowers them to effectively address challenges. Knowledge related to the forest and its protection is primarily held by men, which I believe is due to cultural factors. In fishing, men dominate the catching of fish, while women are responsible for marketing the products. Women do not fish because it is typically done at night, and I think men do not engage in marketing because they do not value this activity.”

Men and women study participants from both districts also highlighted the elderly have knowledge about traditional farming practices. A female FGD participant from a better off household in Nymasheke district explained that: *“There are some farmers, particularly elders, who are still using the traditional farming practices, such as using mouth to plant the beans.”* They also indicated they depend on social networks, including spouses, friends, and family, for information. A young women explained how women get access to knowledge from other fellow women as:

“I am a single mother, and along with other single mothers, we have formed a group where I serve as president. I share my knowledge with them, such as when one member received a field from her father. I supported her by providing seeds and teaching her how to cultivate and grow the plants, as she had little experience in agriculture. This young woman often acknowledges my support and expresses gratitude for the positive impact I have had on her life. I have witnessed many women sharing their knowledge related to agricultural activities.”

Young female household head from a resource poor household in Nyamasheke district

Furthermore, young farmers utilize both social and mainstream media to seek agronomic information, although some face challenges in accessing these resources.

Impacts of gender identities and intersectional issues on participation and voice

This section explores how the interplay between gender identities, intersectional issues, and power dynamics impacts participation and voice, thereby influencing the success of landscape management initiatives.

The Rwandan government has developed policies and strategies to guarantee that all communities, particularly those historically marginalized, have fair access to environmental benefits, can participate equally in decision-making processes, and are protected from environmental harm. Key informants emphasized that legislation guarantees equal rights for all individuals, with the Gender Monitoring Office actively fostering gender equality through educational initiatives. The results show the government is also taking proactive steps to advance gender equality in environmental issues and resource management by establishing platforms that ensure equal participation for both men and women. One such platform is the National Council of Women, which provides women with opportunities to exchange ideas within a committee structure (including positions such as president, vice president, secretary, and advisor) that extends from the village level to the national level. The government puts in place policies and strategies to create enabling environment for women to take leadership positions and enhance their voices. For example, a key informant from Rusizi district mentioned the efforts by providing an example as:

“There is a gender equality policy which recommends that the representation of women in different positions and management positions should be at least 30%, which encourages women to participate, while enhancing their contribution to the improvement of the socio-economic situation of households, self-confidence and empowerment.”

Despite these efforts, we found that men and women have differential capacities to take leadership roles, participate in platforms and influence decisions in these platforms. These disparities are driven by multiple factors including patriarchal culture, socio-economic conditions, and limited institutional capacities.

Capacity to take leadership roles - Few men and women from a variety of social backgrounds, have reported their engagement in community committees. These roles include positions such as chiefs of Isibo, members of village committees, agricultural community promoters, and participants in Acre Fund-TUBURA program. Depending on their specific roles within the community, these committee members adopt various methods to ensure diversity and inclusion, which may involve discussions with residents, organizing citizen assemblies, and hosting parents' evenings. Women who possess qualities such as confidence, active listening, education, reliability, assertiveness, organizational skills, and leadership experience frequently take on these authoritative roles. For instance, a woman from Rusizi, who previously served as a head girl in her school, has emerged as a leader in her church, advocating for environmental conservation efforts.

According to men and women who take leadership roles, the positions present significant opportunities for them for engaging in meetings and training sessions focused on critical subjects such as effective governance and gender equity, which bolster their decision-making skills both within their households and within their communities. For example, a female counselor from Nyamasheke noted that her role in leadership enabled her to acquire valuable skills and build confidence through these educational experiences. However, key informants and FGD participants indicate that, despite the presence of institutional frameworks designed to promote women's leadership in every aspect, their attention is often directed more towards issues pertaining to gender roles rather than environmental or natural resource management. Women are significantly represented in platforms such as citizens' assemblies, weekly meetings for parents, and village

leadership positions, where they engage in discussions about school dropout rates, child protection, family conflict resolution, and health insurance.

Participation and voice in platforms – the results show that men and women have differential participation and voice in the different platforms. These disparities are also driven by multiple factors including patriarchal culture; socio-economic conditions; and limited institutional capacities.

Patriarchal culture - the patriarchal culture assumes men as head of the house and a public figure and provides them with a privilege to be the ultimate decision makers.

Furthermore, the same culture expects women to be submissive limiting their ability to influence decisions. For example, participation of female spouses in an income generating activity, in meetings, or saving groups require prior approval from spouses, limiting their participation and empowerment. A key informant in Nymesheke district states that:

Most missing women from community meetings are married women, who believe their husbands represent them and share information. This is due to the culture where the husband is considered a representative of the household. It is also partly because men think that they will lose their power if their wife start making money and decisions by her own.

Female spouses whose husbands are around, and young men and women have limited opportunities for participating in platforms focusing on agriculture and natural resources due to patriarchal culture.

“...In households where men are out working to earn money, women attend meetings. However, women whose husbands are around, do not actively participate, believing their husbands will attend and share information with them later.....”

Assigning domestic tasks to women, while also they have significant contribution in livelihood activities hold women back from participating in meetings and trainings. Female spouses indicated they often receive limited support from male spouses who are often busy with other income-generating pursuits and spend most of their time away from home, which leaves them with time poverty, limiting their ability to participate in such platforms.

In cases where women attend meetings, patriarchal culture remains challenging for them to share their views. For instance, women FGD participants indicated some men consider women as weak persons, who cannot stand up and speak in their presence. In cases where a woman asks a question during a meeting in the presence of these women, the men plot among themselves, which makes the woman uncomfortable. As a result, women are shy to speak in front of men, because it is not well accepted by communities. In response, meeting organizers monitor such attitudes and encourage women to speak.

Socio-economic conditions such as poverty and being young often hinder participation of men and women from resource poor households from participating in decision making processes. Some women indicated that the rich persons are the ones who have a voice. In individual interviews, a woman from resource poor household said *“I only listen to what other say, I do not like to speak because I feel I do not deserve to speak. Speaking in the presence of people with good living conditions feels uncomfortable as they cannot understand how my situation is to buy-in my idea.”*

Few men from resource poor household also indicated they are shy to speak in public, due to assumptions that their voices will not be valued well because they are poor.

Young people also have minimal participation in decision making processes due to their parents' attendance and sharing of information; their student status, and occasional financial struggles which often lead to out-migration. Most of the young people who participated in the study believe it is not necessary to participate in the meetings since their parents participated. A young man from Nyamasheke district mentioned that: *"I participate in meetings and platforms rarely. For example, if my father is not around, I can replace him; if he attends, he represents our household. I do not attend when he is around, knowing that he will share the information discussed in the meeting."* Despite the progress in women's participation in these platforms, women continue to be constrained to participate in decision-making due to unequal distribution of labour and power. Women specifically are overburdened with productive activities such as crop and livestock production, and wage employment particularly by economically disadvantaged groups, while also being exclusively responsible for domestic work.

Marginalization of the Batwa in Rwanda: A Review

The Batwa, one of Rwanda's oldest indigenous communities, face enduring marginalization that deeply impacts their socio-economic and cultural well-being (Mugarura, and Ndemeye 2002). Historically forest-dependent hunter-gatherers, they were displaced from ancestral lands during colonial and post-independence periods, leaving many landless and reliant on menial labor or begging for survival. Today, social stigma and systemic discrimination perpetuate their exclusion from education, healthcare, and economic opportunities. Few Batwa children attend school, while health disparities and malnutrition are prevalent due to limited access to services. The Batwa are also excluded from governance and decision-making processes, especially in natural resource management, land use, and development programs. This exclusion disregards their traditional ecological knowledge and undervalues their cultural heritage, which could significantly contribute to conservation and sustainability.

The marginalization of the Batwa in Rwanda has significantly affected their access to livelihoods and natural resources, further entrenching their socio-economic vulnerabilities. Historically, the Batwa were forest-dwelling hunter-gatherers whose survival and cultural identity were closely tied to forests. However, their displacement during the creation of national parks such as Volcanoes, Nyungwe, and Akagera has left them landless and without access to the resources that once formed the basis of their livelihoods. The following are some key issues:

Landlessness and Livelihoods

The loss of ancestral lands has rendered the majority of the Batwa community landless. Without land for farming or settlement, many Batwa are forced into precarious forms of livelihood, such as manual labor, pottery, or begging. For example, research indicates that less than 1% of the Batwa population in Rwanda owns land, and those who do have access to small, unproductive plots. This lack of access to productive land has severely limited their ability to engage in agriculture, which is the primary source of income for most Rwandans.

Exclusion from Natural Resources

The establishment of national parks and conservation areas has further restricted the Batwa's access to forests, cutting them off from traditional resources like firewood, medicinal plants, and wild foods. For example, the creation of Nyungwe Forest National Park led to the eviction of Batwa communities, depriving them of their traditional rights to hunt, gather honey, or collect other forest products. Despite their extensive ecological knowledge, the Batwa are often excluded from participating in conservation programs, and their sustainable practices are undervalued in environmental policies.

Barriers to Economic Opportunities

Marginalization also hinders the Batwa's access to economic opportunities. Due to stigma and social discrimination, Batwa artisans often face difficulties selling their pottery or crafts in local markets, further limiting their income. Additionally, they are often excluded from government initiatives aimed at poverty alleviation or agricultural development due to a lack of identification documents, low literacy rates, or unaddressed biases in policy implementation.

Efforts to address Batwa marginalization remain inadequate, despite Rwanda's broader strides in economic development and governance. Policies targeting their inclusion must focus on equitable access to land, education, and healthcare while fostering opportunities for participation in governance and decision-making. International frameworks, such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), emphasize the importance of recognizing indigenous rights and ensuring their representation in development processes. A more inclusive approach in Rwanda would not only enhance the livelihoods of the Batwa but also contribute to sustainable resource management and social cohesion.

Discussion

The Rwandan government has made substantial progress in advancing gender equality. However, the experiences of male and female farmers from different social strata demonstrate that factors such as age, gender, socio-economic conditions, and power relations are pivotal in determining their rights to access critical resources like land, water, finance, and knowledge. These factors also significantly influence the engagement and representation of men and women from various social groups in landscape management impacting effectiveness of landscape management.

Our findings show that both genders, especially younger men, and women from resource poor households, often experience restricted access to resources such as land, water, and financial support due to several factors such as poverty and patriarchal cultures. These forces marginalized groups to use unsustainable practices and restricts their economic opportunities worsening poverty and limiting eco-friendly livelihoods. Our result also shows male heads in households often control information, creating a gender and generational gap in ecological knowledge, which reduces sustainable resource management and reinforces social inequalities. Our research also shows significant differences in how men and women from diverse take on leadership roles and influence decision-making, due to patriarchal norms and economic challenges. Adult men often dominate decision-making in natural resource management reducing women's and young people's sense of agency. Women are underrepresented in conservation decision-making due to barriers like domestic duties and poverty, which marginalizes their voices, especially among resource-poor households.

Limited involvement of women, men, and youth from diverse social groups in landscape management decision making processes leads to overlooking their needs which perpetuates cycles of poverty and poor resource use.

Reduced Agricultural Productivity: Access to essential resources such as land, water, and finance, along with the acquisition and transfer of knowledge, is crucial for effective participation in landscape and natural resource management. However, our study reveals significant disparities in access to these resources between men and women from various social groups. For instance, the lack of credit and financial support for women and youth presents considerable obstacles to establishing sustainable businesses in agriculture and natural resource management. Women from lower socio-economic backgrounds often face greater challenges than their male peers in securing the financial resources needed to adopt modern agricultural practices, influenced by factors like household power dynamics and insufficient collateral. As a result, their capacity to innovate and embrace sustainable technologies is significantly hindered. When access to these resources is restricted for both men and women due to socio-cultural norms, such as inheritance laws and patriarchal structures, the likelihood of investing in sustainable practices diminishes. This leads to overexploitation, soil degradation, and biodiversity loss, resulting in reduced yields and food insecurity. These findings align with other studies. Treidl (2018) and Tantoh et al. (2021) emphasize that women, particularly those from low-income backgrounds, face societal obstacles that impede their ability to obtain land rights essential for engaging in agriculture and landscape management. Additionally, Ochieng et al. (2014) noted that in Rwanda, farms operated by women frequently fall short of optimal cultivation levels, largely due to insufficient access to productive resources and services.

Decreased Resilience to Environmental Changes: Without adequate resources, marginalized groups may struggle to adapt to changing conditions, leading to increased vulnerability to environmental changes, such as droughts or floods. Limited access to resources such as water and finance also restricts their economic opportunities in agriculture and small enterprises, reinforcing poverty cycles and hindering investments in sustainable practices. Fonjong and Zama (2023) also highlighted that climate change exacerbates water challenges, impacting women's ability to perform their multiple roles as farmers and home managers. Furthermore, Liu et al. (2021) emphasized that financial limitation often compels men and women from marginalized social groups to rely on short-term, unsustainable practices, further entrenching poverty and limiting opportunities for environmentally beneficial livelihoods.

Loss of Traditional Knowledge: Different social groups, including women and marginalized communities, possess unique knowledge and practices related to water management. For example, women, particularly those in rural areas, often hold essential insights into the use of household water, conservation strategies, and sustainable practices that can improve water management efforts (Seri 2023). The elderly also have knowledge about traditional practices often include time-tested methods for conservation and resource use which may not be applicable to modern agricultural techniques. The findings of our study also reveal that in households, male heads frequently control the flow of information leading to a noticeable gender gap, where valuable traditional ecological knowledge may be lost. This can diminish the community's ability to manage resources sustainably, thereby reinforcing social inequalities.

Ineffective Resource Management: Participation in landscape and natural resource management initiatives is significantly influenced by intersectional factors such as age, economic status, and marital status. Our research indicates that there are considerable differences in the ability of men and women to assume leadership positions and impact decision-making processes, due to patriarchal norms and socio-economic challenges. The decision-making landscape in natural resource management is frequently dominated by men, which marginalizes the voices and perspectives of women and youth, thereby undermining the value of their contributions. Moreover, the perception that only men and women from better off households have a say in these processes intensifies feelings of inadequacy among less wealthy participants. This economic divide establishes a hierarchy that prioritizes the opinions of the wealthy, while those from less privileged backgrounds feel sidelined. Many young people also perceive their involvement as unnecessary if their parents are engaged, which further erodes their sense of agency and responsibility in these initiatives. These observations align with existing research, which shows that youth participation in landscape management decision-making in Rwanda is constrained by cultural norms that favor older generations (Brown 2021). Women are significantly underrepresented in conservation decision-making forums due to various barriers, including domestic responsibilities, poverty, and time limitations, which differ by gender and social group (Baral et al. 2024). The limited involvement of diverse social groups in landscape and natural resource management can result in inefficient resource utilization and fragmented participation (Mairomi and Kimengsi 2021). Additionally, the lack of inclusivity can lead to policies and strategies that fail to address the specific needs of these groups, perpetuating cycles of poverty and environmental degradation, as well as disparities in leadership roles within collective initiatives.

Health and Well-being Impacts: Limited access to clean water and sanitation resources can have direct health implications for communities. Water scarcity impacts women, by increasing their workload by requiring more time and distance to collect water, resulting in socio-economic challenges and health risks (Seri 2023). Poor health outcomes can reduce the capacity of individuals to engage in productive activities, further exacerbating poverty and resource management challenges.

Increased Conflicts: Limited access to essential resources can lead to competition and conflicts among different social groups. For example, results of our study show for households with smaller plots of land, conflicts can arise between spouses with small landholdings over crop, technology and practice choices making collaborative resource management more challenging.

Conclusion and Recommendations

This research explores the relationship between gender and various identities, such as marital status, wealth, and age, in conjunction with power dynamics. The focus is on how these elements shape resource rights and influence participation in decision-making processes that are critical for effective landscape management in the Rubyiro Sub-Catchment of Rwanda's Rusizi and Nyamasheke districts. The findings reveal that the Rwandan government has made progress in gender equality, but men and women from the diverse social groups face challenges in accessing resources and participate in decision making processes due to age, gender, socio-economic conditions, and power relations, which pose significant challenges for effective management of landscapes and natural resources.

Our research findings reveal significant inequalities in access to resources and participation in decision-making processes between genders, which negatively impact landscape management initiatives. Women, particularly those from lower socio-economic backgrounds, face considerable obstacles in obtaining vital resources such as land, financial assistance, and information necessary for adopting sustainable practices. Additionally, socio-cultural norms further limit access to resources. Resource constraints often lead to a dependence on short-term solutions, overexploitation of natural resources, and a decrease in biodiversity. These dynamics contribute to diminished agricultural productivity, increased food insecurity, and a reduced capacity to adapt to environmental changes, exacerbating poverty, constraining economic opportunities, and hindering sustainable livelihoods. Additionally, the restricted availability of essential resources can provoke competition and conflict among different social groups, complicating collaborative efforts in resource management. The marginalization of the Batwa in Rwanda represents a significant social injustice that has persisted for decades, undermining their cultural identity and socio-economic stability.

Furthermore, the unequal distribution of knowledge can undermine traditional ecological practices, adversely affecting sustainable resource management and heightening social inequalities. The lack of representation in leadership positions, shaped by patriarchal norms and socio-economic conditions, further marginalizes women and youth, leading to ineffective resource management and policies that do not adequately address specific needs, thereby perpetuating poverty and environmental degradation. Addressing these challenges is essential for fostering inclusive agricultural development. Our results have several implications for development policies and practices that support inclusive and sustainable landscape management in Rwanda and beyond:

- It is essential for policy makers and practitioners in landscape management to consider interventions that focus on the needs, priorities, barriers, and challenges of the diverse social groups, and ensure access to resources and services, and benefits.
- Addressing the gender gaps in ecological knowledge in the context of landscape management calls for pursuing inclusive educational and communication strategies. This includes organizing community workshops that cater to men and women from diverse social group, focusing on the food security priorities of women, and creating platforms for dialogue across generations.
- Adopting interventions that address the barriers to enhance equitable participation in leadership positions, while promoting gender-sensitive practices and fostering collaboration is key for inclusive and sustainable landscape management.
- Equitable Land Access: Implement policies that provide secure land tenure to the Batwa, enabling them to engage in sustainable agriculture and other income-generating activities.
- Inclusive Governance: Foster the participation of Batwa in local governance and natural resource management, recognizing their rights as indigenous peoples under frameworks like the UN Declaration on the Rights of Indigenous Peoples (UNDRIP).
- Targeted Economic Initiatives: Develop programs specifically aimed at enhancing economic opportunities for the Batwa, including support for cooperatives in crafts and agriculture, which can help them overcome market barriers.

References

- Akinola, A. (2018). Women, Culture and Africa's Land Reform Agenda. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.02234>.
- Axelsson, R. and Angelstam, P., 2011. Uneven-aged Forest management in boreal Sweden: local forestry stakeholders' perceptions of different sustainability dimensions. *Forestry*, 84(5), pp.567-579.
- Baral, S., Shrestha, K.K. and Tiwari, S., 2024. Persistence of women's exclusion in Nepal's community forestry practice. *Geoforum*, 155, p.104092.
- Botaro, A., and Mulugeta, G. (2020). Role of Women in Agro forestry Management in Tembaro District, Southern Ethiopia. *International Journal of Forestry and Horticulture*. <https://doi.org/10.20431/2454-9487.0602004>.
- Brown, H.C.P., 2021. Youth, migration and community forestry in the Global South. *Forests, Trees and Livelihoods*, 30(3), pp.213-225.
- Buckingham, S., 2020. *Gender and environment*. Routledge.
- Denier, L., Scherr, S.J., Shames, S., Chatterton, P., Hovani, L. and Stam, N., 2015. The little sustainable landscapes book: achieving sustainable development through integrated landscape management.
- Elias, M., Joshi, D. and Meinzen-Dick, R., 2021. Restoration for whom, by whom? A feminist political ecology of restoration. *Ecological Restoration*, 39(1-2), pp.3-15.
- Fonjong, L. and Zama, R.N., 2023. Climate change, water availability, and the burden of rural women's triple role in Muyuka, Cameroon. *Global Environmental Change*, 82, p.102709.
- Harcourt, W., 2020. Unravelling the 'P'word in Environment and Development. *Development and Change*, 51(6), pp.1628-1639.
- James, R., Gibbs, B., Whitford, L., Leisher, C., Konia, R., & Butt, N. (2021). Conservation and natural resource management: where are all the women?. *Oryx*, 55, 860 - 867. <https://doi.org/10.1017/S0030605320001349>.
- Kiyani, P., Andoh, J., Lee, Y. and Lee, D.K., 2017. Benefits and challenges of agroforestry adoption: a case of Musebeya sector, Nyamagabe District in southern province of Rwanda. *Forest science and technology*, 13(4), pp.174-180.
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. London: Sage publications.
- Kristjanson, P., Bah, T., Kuriakose, A., Shakirova, M., Segura, G., Siegmann, K. and Granat, M., 2019. Taking action on gender gaps in forest landscapes. *Program on Forests (PROFOR)*. Washington DC.
- Lau, J. (2020). Three lessons for gender equity in biodiversity conservation. *Conservation Biology*, 34, 1589 - 1591. <https://doi.org/10.1111/cobi.13487>.
- Liu, Y., Liu, C. and Zhou, M., 2021. Does digital inclusive finance promote agricultural production for rural households in China? Research based on the Chinese family database (CFD). *China Agricultural Economic Review*, 13(2), pp.475-494.
- Mairomi, H.W. and Kimengsi, J.N., 2021. Governance dynamics in rangelands: An evaluation of the applicability of Ostrom's principles in the Western Highlands of Cameroon. *Scientific African*, 12, p.e00837.
- Manoby, W., Siscawati, M. and Dewi, K.H., 2023. Papua special autonomy in engagement with gender, generations and deforestation: Insight from feminist political ecology. *Jurnal Bina Praja*, 15(2), pp.431-442.

- Massey, L., Camerden, P., Gaos, A., Liles, M., Seminoff, J., & Ahern, A. (2021). Challenging gender inequity in wildlife conservation: a women's group leading sea turtle conservation efforts in El Salvador. *Local Environment*, 27, 1 - 15. <https://doi.org/10.1080/13549839.2021.1997962>.
- Mugarura, B. and Ndemeye, A. 2002. *Batwa Land Rights in Rwanda*. Minority Rights Group International.
- Musavengane, R., Tantoh, H., & Simatele, D. (2019). A Comparative Analysis of Collaborative Environmental Management of Natural Resources in Sub-Saharan Africa: A Study of Cameroon and South Africa. *Journal of Asian and African Studies*, 54, 512 - 532. <https://doi.org/10.1177/0021909618825276>.
- Nunbogu, A.M. and Elliott, S.J., 2021. Towards an integrated theoretical framework for understanding water insecurity and gender-based violence in Low-and middle-income countries (LMICs). *Health & Place*, 71, p.102651.
- Nyantakyi-Frimpong, H., 2019. Combining feminist political ecology and participatory diagramming to study climate information service delivery and knowledge flows among smallholder farmers in northern Ghana. *Applied Geography*, 112, p.102079.
- Seri, J.A.E., 2023. Women: guardians of water and cultural link amid drinking water scarcity in Gboguhé Sub-Prefecture, Central-West Côte d'Ivoire. *Discover Water*, 3(1), p.19.
- Singh, Ruchika, Karishma Shelar, Marie Duraisami, Will Anderson, and Rajendra Singh Gautam. "Equitable and inclusive landscape restoration planning: learning from a restoration opportunity assessment in India." *Ecological Restoration* 39, no. 1-2 (2021): 108-119.
- Spangler, K. and Christie, M.E., 2020. Renegotiating gender roles and cultivation practices in the Nepali mid-hills: unpacking the feminization of agriculture. *Agriculture and Human Values*, 37(2), pp.415-432.
- Sundberg J (2017) Feminist political ecology: Sites of inspiration and formation. In: Richardson D (ed.) *The International Encyclopedia of Geography*. WileyBlackwell. DOI: 10.1002/9781118786352.wbieg0804.
- Tantoh, H., McKay, T., Donkor, F., & Simatele, M. (2021). Gender Roles, Implications for Water, Land, and Food Security in a Changing Climate: A Systematic Review., 5. <https://doi.org/10.3389/fsufs.2021.707835>.
- Treidl, J., 2018. Sowing gender policies, cultivating agrarian change, reaping inequality? Intersections of gender and class in the context of marshland transformations in Rwanda. *Antropologia*, 5(1 NS), pp.77-95.
- Umuziranenge, G., 2019. Parks' governance and management in Rwanda: Opportunities and challenges of the community participation for a sustainable conservation-Case study of Nyungwe National Park'. *International Journal of Environmental Protection and Policy*, 7(2), pp.61-71.
- Zaremba, H., Elias, M., Rietveld, A. and Bergamini, N., 2021. Toward a feminist agroecology. *Sustainability*, 13(20), p.11244.

