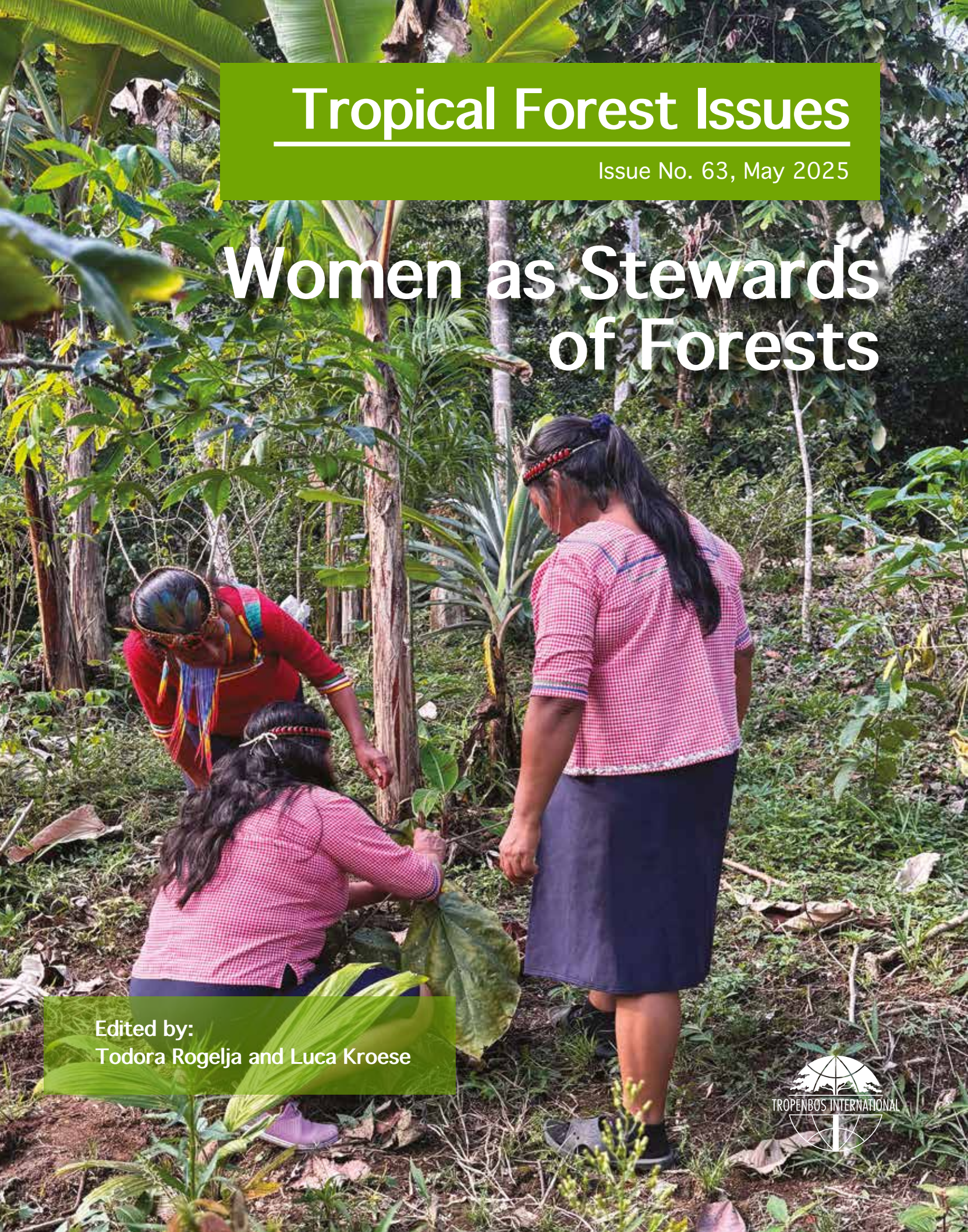

Tropical Forest Issues

Issue No. 63, May 2025

Women as Stewards of Forests

Edited by:
Todora Rogelja and Luca Kroese

TROPENBOS INTERNATIONAL

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Preface

In many tropical forest landscapes, women are the backbone of resilience. Women play vital roles in forest landscapes — as caretakers, knowledge holders, entrepreneurs and first responders to environmental change Unfortunately, their contributions often remain invisible, and they are marginalized in decision-making and governance.

At Tropenbos International, we recognize the invaluable contributions of women to forest conservation, management and restoration. As the core of many forest-dependent communities and at the forefront of transformational change, women are truly the stewards of tropical forests. Their exclusion is not just a matter of injustice; it's also a missed opportunity. If we really want to halt deforestation, create climate-resilient communities and restore our ecosystems, then we cannot ignore the impact that women make in forested landscapes across the tropics.

For a long time, gender equity has been a cross-cutting theme in the work of Tropenbos International. From promoting women's inclusion in forest governance to supporting women-led small-scale businesses, Tropenbos International has consistently championed women's contributions across the tropics. By integrating gender perspectives into all of our thematic areas, we aim to ensure that solutions for sustainable landscapes are inclusive and locally rooted. This edition of *Tropical Forest Issues* is a cherry on the cake for our gender theme, through which we aim to support women's voices and show the impact of women's inclusion.

This edition of *Tropical Forest Issues* highlights the role of women as key agents of change. Whether smallholder producers, environmental activists, mothers or teachers, the women in this volume show their impact on the landscape. By discussing the challenges that women face and the conditions that are necessary to support their inclusive and just participation, the articles in this volume provide a strong collection of inspiring studies and stories of women as stewards of forests. The diverse experiences discussed in the stories and case studies show the opportunities for gender-transformative change in frontier landscapes.

Though too often overlooked by policy and funding spaces, women's contributions to forest conservation, sustainable use, restoration and community resilience are essential. Elevating the voices, leadership and knowledge of women in forested landscapes isn't just a matter of equity — it's a key to lasting, inclusive solutions for people and the planet. Through *Tropical Forest Issues* 63, we shine a light on the vital role of women in forest governance and call on all actors — governments, funders, civil society and the private sector — to step up their support. Let this be a collective call to action: to listen, to learn, and to lead with women at the heart of tropical forest futures.

My thanks go to Todora Rogelja and Luca Kroese as the editors of this edition of *Tropical Forest Issues*, Patricia Halladay for copy-editing and layout, and the sounding board members (Janette Bulkan, Marlène Elias, Iliana Monterroso, Barbara Öllerer and Ida Wallin) for their support throughout the process. Special thanks to all authors and co-authors for their valuable contributions to this volume. I also want to express my appreciation to the Ministry of Foreign Affairs of the Netherlands for funding this initiative as part of the Working Landscapes programme.

My hope is that this volume inspires all readers to view women's inclusion in forest governance not only as essential for gender justice but also as key to thriving and resilient landscapes.

Joost van Montfort
Director, Tropenbos International

Foreword: Women as stewards of forests

In these times of growing environmental and social challenges, it is more crucial than ever to highlight the role of women as stewards of our forests. Around the world, forests are under immense pressure — from deforestation and climate change to land degradation and biodiversity loss. At the same time, the voices of those who have long cared for these ecosystems, and whose lives, livelihoods, cultures and identities are intricately tied to these ecosystems — women, Indigenous peoples, and local communities — are often overlooked in decision-making. Yet, women are at the forefront of forest protection, restoration, and sustainable management. They are the knowledge holders, defenders, and leaders who ensure that forests continue to provide for future generations.

As someone who has spent my life advocating for sustainable land use and community-driven conservation, I am honoured to introduce this edition of *Tropical Forest Issues.* This edition speaks to topics that are close to my heart — the role of women in shaping the future of our landscapes, the power of community leadership and action, and the urgent need to strengthen environmental leadership in the face of growing threats. Throughout my career, at the Green Belt Movement, the Wangari Maathai Foundation, and now at the World Resources Institute, I have seen how women-led initiatives drive climate solutions, restore degraded land, and uplift entire communities. Across the world, similar initiatives are proving that women's leadership is essential to the success of conservation, restoration, and inclusive sustainable development.

Yet, women's contributions to forest conservation extend beyond environmental protection alone. It is not just that women are standing up against deforestation and land encroachment, revitalizing degraded ecosystems, and blending traditional and scientific knowledge for the benefit of our forests. They are also driving economic transformation—leading sustainable enterprises in forest product value chains, managing local forestry initiatives, and sustaining their families and communities.

Despite their vital role, women continue to face systemic barriers—limited land tenure rights, restricted access to finance and technology, and exclusion from policymaking spaces. However, these obstacles have not deterred them. Women across the Amazon, the dry forests of Africa, and the blue forests of coastal ecosystems are taking action, proving that conservation and economic empowerment can go hand in hand. Their stories remind us that investing in women is not just about gender equity; it is about securing the future of our forests, strengthening climate resilience, and fostering sustainable livelihoods.

Women's leadership in environmental work and forest management is not just about trees. The stories in this edition of *Tropical Forest Issues* are not only inspiring examples of women who are leading the way in protecting and managing our forests. They are resisting land grabs, restoring degraded landscapes, and integrating traditional ecological knowledge with scientific approaches. The role of women should not be overlooked. As the cornerstone of their communities, women are building networks that preserve cultures and strengthen social capital. From advocating for climate justice to securing land rights, women are ensuring that conservation efforts remain inclusive, equitable, and deeply rooted in local realities. Their efforts demonstrate that when women are empowered, entire communities thrive.

Now, more than ever, we must recognize and invest in women's leadership in forest conservation, management and use. The challenges are significant, but the resilience, knowledge, and innovation of women in conservation give us hope. Their stories are not just inspiring—they are essential to the future of our forests and our planet. Let this edition serve as a call to action to support and amplify the voices of women who are shaping a more sustainable and just world for all.

Wanjira Mathai
Managing Director, Africa and Global Partnerships, World Resources Institute

Synthesis

A woman rubber tapping in Mekar Raya village, Indonesia. Photo: Irpan Lamago/Tropenbos Indonesia

Women as stewards of environmental and social transformations in tropical forests

Todora Rogelja, Luca Kroese, Janette Bulkan, Marlène Elias, Iliana Monterroso, Barbara Öllerer and Ida Wallin

Women's empowerment must be understood not only as an outcome, but as a process that requires long-term commitment, intergenerational learning, and solidarity across sectors and communities.

Women are driving transformative change across the tropics, yet their critical roles in forest management, conservation and resource use often remain unrecognized. From gathering non-timber forest products (NTFPs) to safeguarding sacred groves and leading community initiatives, women's contributions are essential to the social and ecological fabric of forest-dependent communities (Agarwal, 2009). However, their access to resources and decision-making power remains limited (FAO, 2022). By discussing the essential roles that women play as environmental stewards, the articles in this edition of *Tropical Forest Issues* present the significant impacts that women can have on shaping the future of tropical forest landscapes.

Exchange of agroecological practices for Indigenous communities in Villa Tunari, Bolivia. Photo: Miguel Manchego Chávez/IBIF

Recognizing women as environmental stewards

The theme of women's environmental stewardship is not new, particularly not in the tropics. Historically, women across the tropics have maintained a deep ecological knowledge through their daily interactions with forest resources. Historically, in several Indigenous and matrilineal systems, women were central to land and resource governance (Divac et al., 2023). However, colonialism and the imposition of European legal and patriarchal norms replaced more equitable customary systems, restricting women's access to forests, eroding traditional knowledge systems and undermining women's agency in environmental governance. While some progress has been made through mainstreaming gender policies, legal reforms and community forest initiatives, the gap in achieving formal equity and substantive inclusion remains significant. Across the tropics, women still face legal, cultural and institutional barriers to accessing land, forest resources and leadership positions (WECF, 2020).

To respond to these gaps and address the challenges and opportunities for women in tropical forest landscapes, this edition of *Tropical Forest Issues* is shaped around four critical questions. *1) What gendered barriers do women face in forest landscape management, conservation and use? 2) How should initiatives and policies be designed to enable and support the equal and effective engagement of women? 3) What are the impacts when women are equally and effectively engaged? 4) What enabling conditions are necessary for women in tropical forest landscapes?*

Barriers

The interactions between women and forest landscapes are shaped by complex socio-economic, cultural and institutional forces. In many forest-dependent communities, gendered divisions of labour persist and go hand in hand with unequal access to resources, markets and income (Cruz-Garcia et al., 2019; Kimanzu et al., 2021). For example, women often gather non-timber forest products (NTFPs) for household use, while men dominate commercial forestry and decision-making roles.

Women are frequently excluded from formal governance structures and hold fewer land rights, particularly in patriarchal systems. Cultural norms, logistical barriers, discriminatory policies and lack of recognition of customary systems continue to limit women's access to forest resources and their influence in forest decision-making processes (FAO, 2022). Even when women are included, their roles are often tokenistic, lacking real decision-making power (Mwangi et al., 2011). Understanding the contributions of women and the challenges they face is essential for creating new policies and initiatives to overcome these gendered barriers.

Initiatives and policies

Despite persistent barriers, initiatives across tropical regions have sought to elevate women's leadership in forest governance. Examples include community forestry programmes that include women (Leone, 2019), activities with women's active participation (Kahsay et al., 2021), and co-management that improves both conservation and community well-being (Begum et al., 2022).

This edition of *Tropical Forest Issues* contributes to the growing number of cases and stories that highlight women tackling gender barriers. The articles here highlight how institutional support from NGOs,

national governments and international donors have enabled women's groups to participate in forest monitoring, patrols and restoration. These initiatives can shift women's roles from informal "caretakers" to recognized forest defenders and leaders (Begum et al., 2022; Agarwal, 2009). With targeted support and capacity building, such initiatives can support women's participation in achieving a range of impacts, as these articles show.

Impacts

Women's participation and leadership are not only about equal rights. There is also growing empirical evidence that gender-inclusive governance leads to improved outcomes. Women-led or gender-balanced forest user groups have demonstrated positive effects on forest conservation, biodiversity protection and community livelihoods (Killian and Hyle, 2020; Coleman and Mwangi, 2013). These benefits extend beyond ecological impacts. Where women have been meaningfully included in governance, communities report stronger social cohesion, enhanced food security and improved economic resilience (Killian and Hyle, 2020; Coleman and Mwangi, 2013). Building on existing knowledge of the impacts of women's participation, this edition of *Tropical Forest Issues* demonstrates the effects that women can have on tropical forest landscapes. The focus on impacts has led to a range of inspiring stories and powerful studies, showing the influence of women as stewards of forests.

Enabling conditions

Benefits are most pronounced when inclusion is accompanied by access to resources, training and decision-making authority. Without such enabling conditions, inclusion alone has a limited impact on gender equity and on the sustainable governance of forested landscapes. (FAO, 2022; Mwangi et al., 2011).

Korebaju women at a seed exchange in the municipality of Solano, Colombia. Photo: Mabel Martínez/Tropenbos Colombia

Agroforestry work in Ghana. Photo: Christiana Otchere/Tropenbos Ghana

Thus, transformative change in tropical forestry sectors requires moving beyond inclusion to full empowerment. Enabling conditions should include formal recognition of women's land and resource rights, gender-responsive policy frameworks, investment in training and leadership development, and dismantling of constraining patriarchal norms in both policy and practice (Agarwal, 2009; Colfer et al., 2016). Related enabling conditions are emphasized throughout this volume, together with the barriers women face and how they challenge gender norms. A gender-transformative approach also requires addressing structural inequalities — lack of access to credit, markets, technologies and information — and designing forest policies that are not just inclusive on paper but effective in practice.

This edition tackles the four key questions through a diversity of perspectives, from grassroots initiatives to academic works, and from government bodies to international organizations. Those perspectives showcase practical examples from tropical forests of women using traditional knowledge, women's effective participation, women-led entrepreneurship, leadership in forest-dependent communities, and women changing power dynamics. Through five thematic sections, this edition of *Tropical Forest Issues* sheds light on how women across tropical landscapes are driving change — not just within forests, but across broader systems of governance, livelihoods, entrepreneurship and community resilience.

Women as carriers of knowledge

The articles in Section 1 show that Indigenous women have long been stewards of ecological knowledge, applying traditional practices that support sustainable forest management and biodiversity conservation. Quijos women in Ecuador play a pivotal role in maintaining traditional forest gardens, despite facing challenges such as land fragmentation and extractive industries [Feature 1].* Their work in the Sacha Awana initiative exemplifies efforts to revitalize Indigenous knowledge and secure land rights through collective action. Similarly, the expertise of Ba'Aka women in the Likouala forest, Republic of Congo, demonstrates that a deep understanding of hunting, gathering and resource conservation is critical yet often overlooked [1.3]. In Suriname, Afro-descendant women play a crucial role in transferring their knowledge of landscape management to the next generations [1.2]. These cases demonstrate how women's ecological

**Please note: numbers in square brackets are cross-references to articles in this volume.*

knowledge is integral to sustainable forest management and food sovereignty.

Despite their extensive ecological expertise, women face structural barriers and are often marginalized within their landscapes, as is the case for both Ba'Aka women in the Republic of Congo and Saamaka women in Suriname [1.3; 1.2]. The lack of clear rules within the customary land-holding system in Suriname has led to gold mining operations destroying areas in the Saamaka territory of important non-timber forest products that women rely on [1.2]. In Colombia, Korebaju women are marginalized and face gender-based violence [1.4]. Overcoming such barriers requires policies that integrate women's traditional knowledge and leadership in forest landscape conservation and management efforts. Such initiatives have supported Korebaju women in playing a critical role to address social and environmental challenges related to food security, and to manage nurseries for native species [1.4].

Women's leadership in forest governance is not only about their contributions, but also about how they pass on ecological and cultural knowledge to future generations. This is beautifully illustrated in the example of *Piangüeras* women, who convey their love for protecting mangroves and *piangua* (molluscs) from one generation to the next [1.1]. Similarly, Ba'Aka women in the Republic of Congo convey their extensive knowledge of mammals and the environment to the next generations. This cultural process makes them guardians of biodiversity and the local culture [1.3].

Together, the articles in Section 1 emphasize the vital role of Indigenous women and the knowledge they hold for tropical forests. They highlight the need for policies and practices that dismantle systemic gendered barriers, promote women's traditional knowledge, and support women's leadership and contributions to natural resource management. For this to happen, the necessary precondition is inclusive participatory governance that comprehensively engages women.

Meaningful participation of women

Section 2 delves into the heart of the meaningful participation of women. Articles show how women can succeed in becoming powerful agents, shaping forests and forestry in their own context, from industrial forestry in Brazil to environmental protection in the Indian Himalayas. In doing so, women strengthen social resilience and create prosperity.

In Cameroon, Colombia and Indonesia, women still face exclusion from decision-making and limited access to land due to persistent patriarchal norms and gendered roles [2.1; 2.2; 2.3]. Women are excluded from leadership roles and have weak institutional support, as is seen in the Chiquitania region in Bolivia and the forestry sector in Brazil [2.1; 2.3]. Such exclusion from participation limits women's access to markets and financial institutions, which restricts their economic autonomy, particularly for rural women [2.1; 2.4]. In forest governance research and academia, women are marginalized due to gender norms [Feature 2]. When these barriers are tackled, and initiatives promote women's meaningful participation, opportunities for empowerment and leadership emerge across forest landscapes.

Abonis women in Cameroon, supported by international organizations, obtained legal rights to wood from community forests and timber operators [2.4], and in Ghana, Village Savings and Loan Associations (VSLAs) have supported women to invest in their farm operations and increase their economic resilience [2.1]. The Brazilian Forest Women's Network has successfully implemented monitoring, mentoring programmes and awareness campaigns, significantly enhancing women's active participation and empowerment in the country's forest sector [2.3]. Furthermore, the Tropenbos International network developed a gender-transformative monitoring framework for identifying what works and what doesn't work when it comes to women's meaningful participation in landscape governance [2.1]. When not carefully designed and properly monitored, women's participation in forest governance often falls short of its potential, leading to unequal benefits for women compared to men [2.1; 2.2].

The involvement of women in forest decision-making at the community level has positive and mutually reinforcing effects on both forest management and community well-being. When meaningful and successfully implemented, women's participation results in reclaimed rights to land management and regained power in decision-making. This in turn brings multiple environmental, social and economic benefits for both the women involved and the local communities. That is how agroforestry can become a way to mitigate climate change impacts [2.2] or restore community forests and rehabilitate degraded land [2.4]. Women's engagement increases the economic independence of the women involved and their families [2.1; 2.4]. Finally, women's participation and leadership contribute to social impacts such as the development of mentoring programmes [2.1; 2.3], safe spaces [2.1; 2.2; 2.4],

income generation [2.1; 2.4] and increased food security [2.1;2.4].

Overall, Section 2 emphasizes women's meaningful participation in forest governance as an ongoing endeavour that requires unwavering awareness, monitoring and focus by organizations and individuals at all stages and levels of decision-making. The empirical cases presented here show that these efforts are worthwhile for achieving more inclusive governance, enhancing community resilience and advancing both environmental sustainability and gender equity.

Women-led entrepreneurship

Section 3 explores women-led entrepreneurship, including the barriers that women face in advancing forest initiatives and approaches to secure enabling conditions that address these barriers. When successful, women entrepreneurs improve sustainable resource use and increase investments in households while enhancing community governance.

The lack of availability of and access to resources, whether for domestic energy consumption [3.3] or non-timber forest products [3.5], are key constraints for forest-dependent communities. Often, lack of access to resources is worsened by forest degradation or rampant deforestation, affecting already isolated and impoverished local communities [3.2; 3.4]. Tensions in the access to and distribution of resources are tied to the recognition of women's rights to collect and manage forest resources and make decisions about them. Women are often restricted from accessing forest resources — especially those that have high commercial value — and rely on access to fuelwood [3.1; 3.3], medicinal plants [3.4], agroforestry and beekeeping [3.2], and NTFPs [3.5] for domestic consumption and supplementary income. Scarce availability and lack of access result in women travelling longer distances to gather resources like fuelwood, water and livestock feed. This disproportionately increases their unpaid care and domestic workloads, and exacerbates their risk of gender-based violence.

Two articles in this section explore efforts to strengthen women's agency in forest restoration and management activities; one in in Mali and one in DRC [3.1; 3.3]. They discuss how clean-cooking initiatives in both urban and rural areas improve women's entrepreneurship and simultaneously address barriers to securing access to resources in the supply and demand chain for fuelwood. In forested landscapes, whether the Sahel dry forests in Burkina Faso or the rainforests in the Amazon region, the governance arrangements in which women operate

Women working on handicrafts in Gema village, Indonesia. Photo: Irpan Lamago/Tropenbos Indonesia

are highly informal [3.2; 3.5]. This hinders their ability to engage in entrepreneurial activities, and limits their access to credit and understanding of market forces.

Building women's capacities, leadership and entrepreneurial skills enhanced women's direct participation in forest value chains with key socio-environmental and economic impacts. In DRC and Australia, women's organizations helped leverage negotiations with private companies and the government to secure access to raw materials and facilitate access to markets, training and credit [3.1; 3.4]. Enhanced skills have facilitated women members of associations to achieve decision-making power over the distribution of benefits and to secure investments that strengthen their skills to develop new revenue streams from more efficient charcoal production processes [3.1]. Similar to the initiatives in DRC, women-led charcoal production in Mali enhanced the inclusion of women in forest management committees. This led to an increase in women achieving leadership positions, discussing community forest plans, participating in forest committees, and monitoring community activities. These efforts have led to higher tree survival rates and reductions in fuelwood consumption, which have alleviated women's workloads associated with resource collection [3.3].

Entrepreneurship initiatives also boost women's economic agency [3.1; 3.2; 3.4; 3.5] while improving food security, promoting sustainable land-use practices, strengthening alliances with other women-led cooperatives, more effectively advocating for fair market prices, accessing government support programmes, and establishing equitable resource distribution mechanisms. Collectively, the articles in Section 3 highlight the importance of strengthening efforts to organize the collective voices of women and to continue to build their skills and capacities for more sustainable entrepreneurship.

Women's empowerment and leadership

Although women face structural challenges in achieving leadership positions in forest management, the articles in this section showcase how some women are overcoming these barriers and exercising leadership**.** For instance, women leaders in India are challenging patriarchal norms and practices that exclude women from decision-making and ignore their contributions to, roles in and knowledge of forest management [4.1; 4.5]. These norms are also embedded in institutional policies, which fail to recognize or support women's expertise and conservation efforts [Feature 3; 4.5]. Across regions, women are rising above a range of other gender-based barriers that include burdensome care responsibilities [4.3], inequalities in accessing financial and material resources, training, information and technology [4.2], and limited rights to land and trees [4.4].

There is a wide range of initiatives where women are leading as forest stewards, with demonstrated social and environmental impacts. One such example of multiple outcomes from women's forest leadership is the cultivation of oak trees as natural firebreaks in Uttarakhand state in India [4.5]. Through this initiative, women managed to conserve biodiversity, protect water sources, restore soil stability, and ensure the survival of both the communities and the natural environment. Similar results can be seen from women refugee groups in Uganda, who supported tree planting to improve the safety of women when collecting fuelwood and NTFPs, and to improve sustainable harvesting and forest management [4.4]. This demonstrates how these women are leading innovations to manage the trees they rely on, thereby securing a sustainable supply of NTFPs and fuelwood, despite high pressure on tree resources. In Brazil, Xerente Indigenous women are working as volunteer firefighters, and going beyond fire suppression measures to promote environmental education and restoration within protected areas [4.2].

The stories in this section demonstrate the power of role models to lead the way for women leaders in forestry [4.1; 4.3]. Whether they are contributing to environmental management of the landscape — such as sustainable management of forests, water and biodiversity [4.3] — or to cultural preservation and support for youth [Feature 3], women play key roles in their communities. To support these efforts, it is crucial to address women's collectivization and mutual support [4.1], capacity building and acquisition of new skills [4.1; 4.2], awareness of gender-based norms [4.2], and peer-to-peer sensitization [4.4]. In the words of a woman leader from Indonesia, formal education and knowledge are catalysts for women's leadership; "*When we are educated and equipped with the right knowledge, we become strong voices for change in forest management*" [4.3]. Together, the articles in Section 4 underscore how women's leadership and empowerment are essential in advancing sustainable forest management, gender equity, women's livelihoods and community resilience.

Women changing power relations

Through women's knowledge, meaningful participation, entrepreneurship and leadership, gender barriers in forest management and governance can be overcome. The

Woman planting a coffee tree for agroforestry near Kamora village, Indonesia. Photo: Irpan Lamago/Tropenbos Indonesia

articles in Section 5 document initiatives that drive change at both the local [5.2; 5.3; 5.5] and the global [5.1; 5.4] level. In all cases, it becomes clear that usually men hold power, whether customary, legal or economic or all three, while women lack economic independence and access to or ownership over land. In the Philippines, only one-third of official land agreements are held by women [5.2], while in DRC, women farmers traditionally have access to their father's land only before marriage and to their husband's after marriage [5.3]. Women's contributions to the household economy, including through the cultivation of food plants, have been depreciated, not recognized or rewarded [5.1; 5.2; 5.5].

Yet, Indigenous women resist colonial and patriarchal oppression in forest governance, emphasizing the need for policy reforms that empower them [5.1]. The articles further document two principal ways by which women are working to surmount customary and legal barriers and reclaim power. First, women join forces at the community and regional levels, where they share knowledge, training opportunities and manual labour as they build solidarity and representative organizations. Such ways are practised by Indigenous women from Quezon in the Philippines [5.2] and by the HaKA initiative in Indonesia [5.5]. Second, allying with intermediary national and international support organizations opens up opportunities for empowerment and addresses structural gender barriers [5.1; 5.4; 5.5]. One noteworthy point is that women's gains have come through targeted initiatives, rather than through open challenges to the patriarchy [5.1; 5.2; 5.3; 5.5]. In the case of DRC, with support from Tropenbos, women who have started cocoa farming, previously a male domain, report holding land concessions in their name, controlling a greater share of earnings, and improving their status in their households [5.3]. And while significant gains can be achieved at a local level, it is important to consider the local consequences of higher-level forest governance, such as the European Union Deforestation Regulation (EUDR) [5.4]. Such policies risk harming smallholder farmers, especially women and marginalized groups, by adding administrative burdens, thus favouring large-scale producers. At the same time, they offer multiple opportunities for assessing progress and inputs on how social safeguarding, intersectional inclusion and benefit-sharing can empower local and Indigenous communities.

Generally, the articles in Section 5 show how women are dispelling myths, including that of their physical weakness. With allies, women are overcoming patriarchal traditions that discriminate against them, and transforming their

A key takeaway from this issue is that transformative change does not result from isolated actions. It emerges when inclusive principles are embedded across all levels of forest governance — from grassroots organizations to national policy; from customary institutions to global frameworks.

lives and communities. With collective and targeted initiatives, women are breaking barriers and forcing changes to gendered norms.

Conclusions and ways forward

As the articles throughout this edition of *Tropical Forest Issues* show, women's roles in tropical forest landscapes are profound and wide-ranging, yet they remain undervalued and under-supported in many forest governance systems. This collection of cases from around the world bears a powerful message — **women are not only users of forest resources but stewards of ecological knowledge, agents of community resilience, and leaders in sustainability and innovation.** Despite this, they continue to face deeply embedded gendered barriers that hinder their ability to participate meaningfully and equitably in decisions concerning forest conservation, management and use.

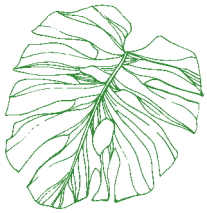
The challenges that women face are shaped by a complex interplay of cultural norms, legal structures and institutional biases. Limited access to land, lack of recognition of women's or customary rights, exclusion from leadership roles, and restricted access to markets, finance and training persist across many forested landscapes. Moreover, these barriers are often reinforced by narrow policy approaches that treat women as a homogenous group, overlooking how age, ethnicity, marital status, and other factors shape their experiences. Such systemic limitations mean that even when women are included in forest initiatives, their participation is often symbolic rather than substantive.

There is growing evidence that gender-inclusive forest governance is more effective, equitable and sustainable. **When women are meaningfully engaged — when their knowledge is valued, when they are equipped with the tools and resources to lead, and when institutional spaces are designed to include them — forests are managed more sustainably, biodiversity is better conserved, and climate resilience is enhanced.** Socially, women's inclusion contributes to stronger community cohesion, improved food security, and greater transfer of intergenerational knowledge. Economically, equitable participation opens up opportunities for women to diversify livelihoods, increase household incomes, and contribute to more resilient local economies. The articles demonstrate that integrating gender equity into forest governance creates benefits that extend well beyond women themselves — reaching families, communities, ecosystems and future generations.

To achieve these positive outcomes, enabling conditions must be created. **Women's meaningful participation cannot be reduced to mere presence. It requires structural shifts that allow women to shape decisions, institutions, and governance systems in ways that reflect their values and lived experiences.** The examples from this edition show the need for legal frameworks to secure women's land and resource rights in ways that are both gender-just and context-sensitive. Institutions must adopt gender-transformative approaches that move beyond quotas or representation and toward the redistribution of power. Lessons from across the world show the importance of building women's capacity, fostering intergenerational knowledge exchange, ensuring gender-sensitive monitoring, and creating safe, inclusive spaces for women. Through such actions and foundational conditions women can gain power and lead societies to prosperity. Policies and programmes must invest in education, leadership development, access to credit, and inclusive knowledge-sharing systems. **Moreover, change must be collective — men and women must be engaged together in reshaping the norms and structures that perpetuate inequity.**

Strategic priorities

Looking ahead, three strategic priorities emerge:
First, women's rights to land and resources must be strengthened through legal reforms and the recognition of customary systems that support equitable access.



Second, ongoing investments in women's economic empowerment must be made to support women-led forest enterprises, inclusive value chains, and access to finance and markets.

Third, enabling contexts for leadership — including education, networking, collective action, and partnerships with supportive institutions — must be created.

As global pressures on tropical forests increase — from climate change to commercial exploitation — the contribution of women as stewards of these landscapes is more vital than ever. Their leadership, resilience and innovation must not only be acknowledged, but must also be intentionally centred on shaping the future of sustainable and equitable forest governance.

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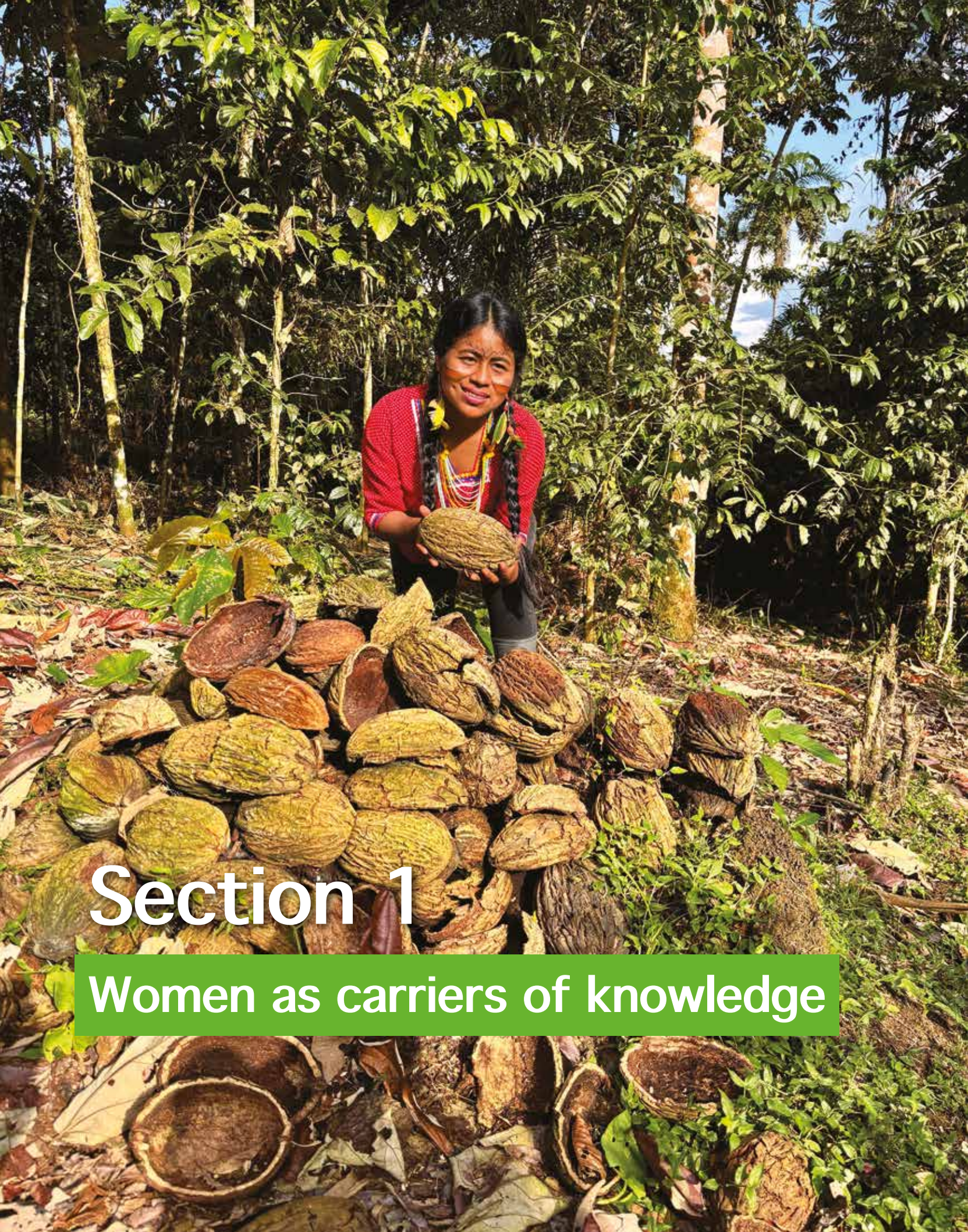

Section 1

Women as carriers of knowledge

Previous page: Roxana Tanguila with husks of wild cacao, Ecuador. Photo: Andrea Cuéllar

1.1

A *piangüera* woman collecting piangua in the mangrove forest of Punta Soldado. Photo: Sebastián Montoya Calle

Piangüeras: guardians of the mangrove in the Colombian Pacific

Pioneers of sustainable transformation

Stefan Sorge, Natalia Zapata Delgado, Camilo A. Romero Mera, Matilde Mosquera Murillo, Martha Liliana Salazar Ibargüen, Michel Sinisterra Vergara and Lucy Fernanda Mosquera

"Piangüeo, a Colombian Pacific tradition, empowers women economically while preserving mangroves. I aim to sustain this practice, promoting women's political participation, recognizing our identity shaped by the piangua mollusc and our resilience."

Matilde Mosquera Murillo

Introduction

This article explores the role of *piangüera* women in mangrove conservation, restoration and management, focusing on Bahía Málaga and Punta Soldado in Colombia's Valle del Cauca department. These areas are home to around 130 *piangüera* women, of the 11,328 *piangüeras* in the Colombian Pacific region (Codechocó, 2023). Colombia's Pacific coast, part of the Chocó Biogeographic Region, hosts 195,000 hectares of mangrove forests (Agenda del Mar, 2023) that provide vital ecosystem services such as carbon sequestration, coastal protection, and nurseries for fish and molluscs (see Figure 1).

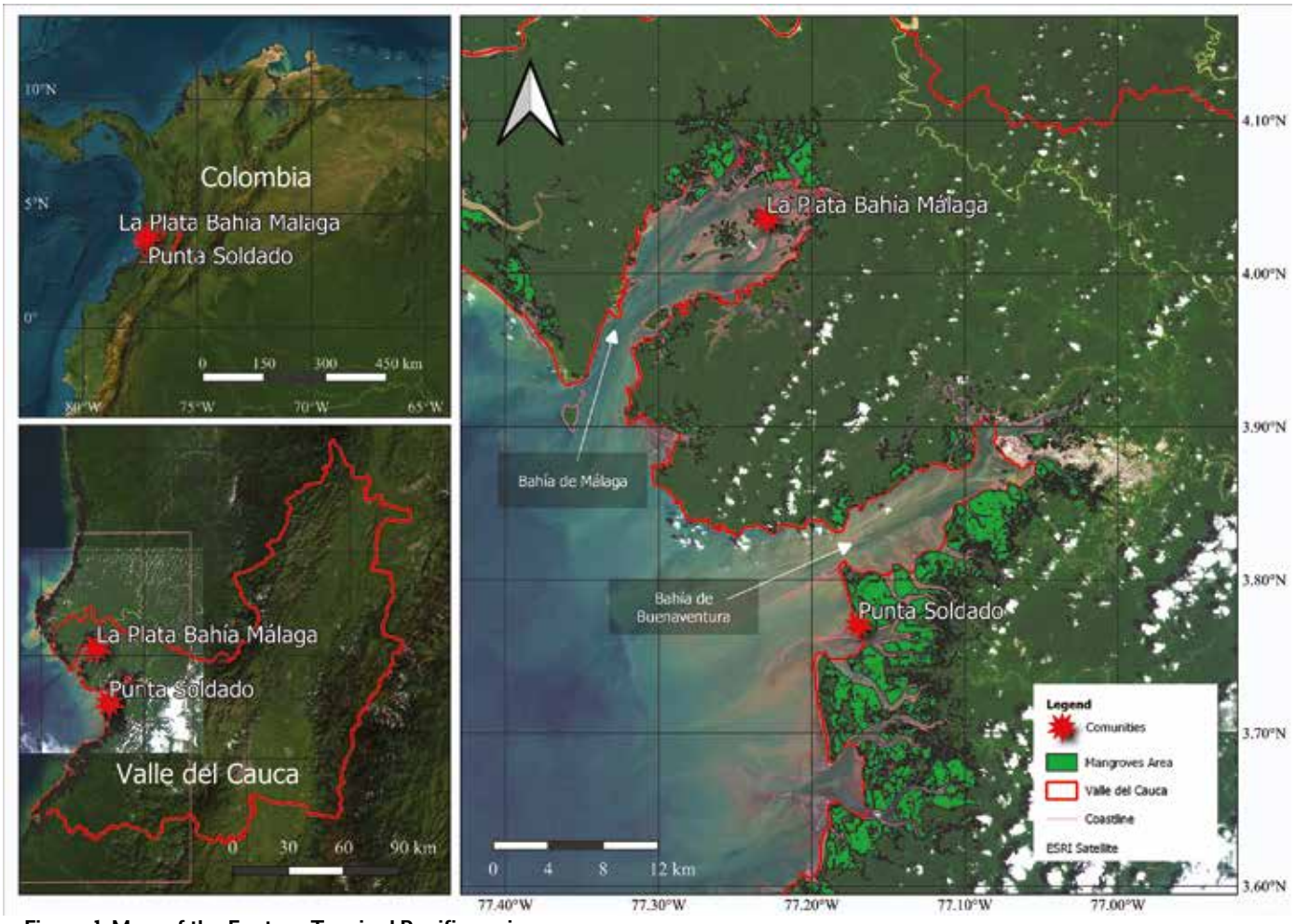

Figure 1. Map of the Eastern Tropical Pacific region
Source: created by co-author Natalia Zapata-Delgado, with QGIS

One traditional activity of these communities is harvesting *piangua* (*Anadara* spp.), a practice performed almost exclusively by women (*piangüeras* or *concheras*), who manually collect the mollusc from nutrient-rich mangrove root zones at low tide. This work provides *piangüeras* women with economic independence, food security for their households, and time for family care. As their work is closely linked to mangroves, the *piangüeras* have become their guardians, facing the negative effects of human activities and natural threats, while preserving their cultural heritage. The percentage of *piangüeros* men is typically very low (around 1–5%), although it varies across communities. Men have traditionally been fishers, a profession that generates most of the income in the Pacific region. The number of *piangüeros* men can increase by up to 15% during the fishing off-season.

The authors used a narrative inquiry to explore *piangüera* women's contributions to the sustainable management of mangroves, drawing on the testimonies of *piangüeras* to explore their lived experiences and roles. Through discussions among the authors, which include *piangüeras* and researchers, personal stories of *piangüeras* were shared, focusing on their roles and on challenges and contributions to mangrove conservation and management. Additionally, the exploration is enriched by the authors' personal experiences working on site, along with a brief review of literature on mangrove ecosystems and local conservation efforts in the region.

Daily and structural challenges for *piangüeras*

Piangüeras have developed practices and rules to promote *piangua* conservation, such as rotating harvesting spots and implementing a closed season during the neap tide (*quiebra)* (Espinosa et al., 2010). The use of motorboats and *potrillos* (traditional wooden boats without engines) to travel to different mangroves and of personal protection equipment has improved harvesting efficiency.

Piangüeras face challenges that include health risks from animal bites and infections, threats from armed groups (Morales, 2017), and conflicts over mangrove use with other communities, leading to *piangua* overexploitation. Mangrove deforestation due to illegal activities (logging, mining) and natural threats such as coastal erosion exacerbate these issues (Anaya et al., 2020). In addition, the lack of economic alternatives constrains conservation efforts, as the mangrove is the primary livelihood for many women; this makes it difficult to sustain conservation practices such as a closed season.

In Colombia, regulations prohibit the commercial exploitation of mangroves due to their importance as strategic ecosystems for coastal areas. However, governmental presence through environmental authorities or the military is limited. Policies and legislation such as *Resolution 1263* of 2018, *Law 2243* of 2022, and the updated National Program for the Management, Protection and Sustainable Use of Mangrove Ecosystems of 2024 aim to promote the sustainable use of mangrove forests. These initiatives are largely centralized, with limited involvement from local organizations in their design and implementation.

Local territories in the region face significant challenges, including severely limited access to communication, basic services, education and technology. These barriers, coupled with a lack of political participation and advocacy in national decision-making, hinder local capacity building and prevent the needs of *piangüeras* from being prioritized. Their absence of participation in decision-making limits the resources that are allocated for developing economic alternatives and coordination among groups.

Community planning in collective territories has traditionally been led by men, who have more opportunities to build a political career. In contrast, women have focused on household and collective care due to traditional gender roles (Solano et al., 2021). Other barriers for women include low education attainment. This has limited women's active participation in community politics, hindering their leadership development and reinforcing their restricted capacity in and contribution to decision-making. As a result, their interests — such as the care of *piangua* and mangroves — are often overlooked in territorial planning. When women are not involved in these processes, the authors have seen that mangroves are frequently neglected by decision-making, conservation and territorial management projects, such as REDD+.

"As a* piangüera*, since I was eight years old, I have been preserving the mangrove, not only for myself but also for future generations, because there are many stories to be told in this beautiful forest full of biodiversity. I would like to study biology to become the first* piangüera *biologist and contribute scientifically to my community, but the current conditions do not allow me to do so."

Martha Liliana Salazar Ibargüen, member of the community council of the Black community of La Plata.

Organizing as a basis for women's leadership in sustainable mangrove use

Community organizations have played a crucial role in increasing the visibility and strengthening of *piangüeras* leadership in mangrove conservation within their villages while fostering cooperation between *piangüeras* at local and regional levels. *Asociación Raíces Piangüeras* (*Piangüeras* Roots), a group formed by women from Bahía Málaga who sought to amplify their voices, exemplifies this approach and significantly enhanced their social and political networks. Representatives from the association have participated in national and international conferences, such as COP16 in Cali, taken on leading roles in research projects and supported other *piangüeras* in doing the same thing in other territories.

The association's goal is to strengthen the conservation and transmission of traditional knowledge about *piangua* management for future generations and other interested actors. Members also focus on the ecological preservation of the species and its habitat through the development of social, cultural, environmental and economic activities at the local, regional and national level.

Collaboration among the *piangüeras* at the local level has had a significant impact on the region, positioning them as key actors in mangrove management and the defence of their territories. In particular, *Asociación Raíces Piangüeras* has been an inspiration for *piangüeras* women of Punta Soldado, who are in the process of forming the *Association of Piangüeras and Mangrove Planters* with the support and guidance of the women of Bahía Málaga. *Piangüeras* in Punta Soldado have developed innovative methods to effectively restore the mangroves, such as the *vivero flotante* (floating nursery). This is a device made from local materials that allows mangroves to grow as they would in natural conditions, floating on the water. Its

A *vivero flotante* (floating nursery). Photo: Camilo A. Romero

use is currently being researched by several Colombian universities to better understand local solutions and upscale them to other regions.

Increasingly, however, in spite of these efforts, *piangüeras* from both areas report that *piangua* is becoming scarce, particularly in Punta Soldado. The implementation of conservation practices is hindered by the lack of agreements between *piangüera* groups from local and neighbouring communities and by insufficient resources for *piangua* and mangrove monitoring.

In Colombia, the owner of mangroves is generally the state, and local Afro-Colombian communities have the right to manage and use them for self-consumption (*Law 70* of 1993). As a result, each community is responsible for its territory, making it challenging to enforce laws given the absence of state organizations and lack of resources for community self-organization.

According to Nancy Caicedo, *piangüera* from Punta Soldado: *"The mud (of the mangrove) means a lot to a* piangüera *woman because it gives us the livelihood to survive. If the mangrove runs out, we also run out of oxygen, because it is the one that gives us the real purity of oxygen. The mangrove gives us many opportunities, both for us and for the animal species."*

Monitoring in the region is also challenging, especially for local communities. If a group from a neighbouring territory discovers a resource-rich area, it can exploit it, even without the legal right to do so. This happens with both timber and *piangua*. This highlights the crucial importance of agreements between communities, and of enforcing these agreements to support mangrove conservation. Moreover, efforts to defend mangroves against timber extraction are further hindered by the lack of cooperation between groups of *piangüeras* and authorities. This weakens the capacity of the *piangüeras* to monitor and control their territory, and to deter illegal loggers.

In other regions of the Colombian Pacific coast, communities face additional challenges due to their small size, remoteness and peripherality, which affects the participation and leadership of *piangüeras*. In contrast, Punta Soldado has relatively easy access to resources and services due to its proximity to the port of Buenaventura and the attention of academics and tourists.

Community and nature-based tourism as an alternative economic activity

Women in the region have developed cultural tourism strategies such as the *Ruta de la piangua* of the *Asociación Comunitaria Ecomanglar de La Plata Bahía Málaga* and the *Ruta de la Concha* of the *Agencia Comunitaria Playa Viva* in Punta Soldado, which incorporate traditional mangrove knowledge and economic models. These initiatives allow locals and visitors to experience *piangueo* socio-culturally, promoting economic transformation. This approach reduces the impact on natural resources while generating income for women and contributing to ecosystem conservation, food security and cultural preservation. The communities have regulations to ensure that the number of tourists does not exceed a certain limit; this supports the carrying capacity of ecosystems. This local management differs from neighbouring areas where a high number of tourists are allowed, especially for whale-watching (Montaño Rozo and Vargas Nieto, 2021).

The dynamism promoted by the *piangüeras* has strengthened the species' gastronomic reputation, positioning it as a cultural product at the national and international level. This increased visibility should lead to development of a sustainable value chain and added local value for the *piangua*; this would allow *piangüeras* to earn higher incomes from less harvesting, alleviating

pressures on mangroves. The demand for sustainably harvested *piangua* is also a strong incentive to promote conservation practices at the territorial level. This demand can also foster capacity building for women so they can participate in negotiations and policy development to maintain the sustainable collection of *piangua*. The project InnoPiangua, for example, aimed to develop sustainable value chains for *piangua* in Colombia in order to add value and justify higher prices (Herde, 2019). However, not implementing commonly developed and agreed regulations, and a lack of monitoring, sanction systems, as well as higher consumer prices, can lead to new challenges and conflicts related to this resource.

Local knowledge and scientific knowledge for mangrove restoration

Synergies between local and scientific knowledge are central to the sustainability of mangroves and *piangüeras* and to the design and implementation of policies and strategies. The social-ecological systems approach can enhance local initiatives by integrating the social, ecological and technical aspects of mangrove governance (Sorge et al., 2022). This approach helps practitioners, policymakers and academics understand the complex interactions between *piangüeras*, their communities, the economy and mangrove ecosystems, leading to more effective management strategies. It is based on a participatory and gender-based method and an inter-institutional articulation that builds the technical and financial capacities for women to be mangrove safeguards.

Community-organized piangua harvesting in the region. Photo: Sebastián Montoya Calle

"I conserve the* piangua *and the mangrove because I love nature and my territory. My mother passed on to me this love for conservation and I want our future generations to know the* piangua *and follow this legacy that our ancestors have left us. The mangrove is life and by taking care of it we save lives."

Lucy Fernanda Mosquera, member of the *Asociación Raíces Piangüeras* and guide of the *Ruta de la Piangua* tour

Building on this idea, *piangüeras* have taken the lead in mangrove restoration, collaborating with academic and technical initiatives from both governmental and non-governmental organizations. In Punta Soldado, the group of women mangrove planters has been strengthened, and they have committed to designing and implementing effective restoration mechanisms based on technical knowledge from institutions and the local expertise they have gained through experience.

These mechanisms are examples of social and governance innovation that consider the technical requirements for the successful growth of each mangrove species. Of particular note is the design and implementation of the floating nurseries for *Rhizophora mangle* (red mangrove), which are later planted in the mudflats suitable for this species (see photo, page 6). In addition, women in Punta Soldado have established nurseries for and planted *mangle nato (Mora oleifera)* and *mangle piñuelo (Pelliciera rhizophorae)*; both mangrove species are classified as Vulnerable in the IUCN Red List of Ecosystems, Mangroves of the Tropical East Pacific (Montes Chaura et al., 2024).

Participatory monitoring

Piangua monitoring aims to assess productivity rates and to generate data that can inform decision-making by local and national authorities and actors, enabling the effective rotation of mangrove areas for sustainable harvesting, conservation and long-term productivity.

Planting of natural mangrove, *Mora oleifera* and *Pelliciera rhizophora* in Punta Soldado, as part of a community-organized scientific tourism experience. Photo: Natalia Zapata

Additionally, monitoring ensures that harvesting adheres to the minimum-size requirement established by the National Fisheries Authority (AUNAP), which allows sanctions against noncompliance. These monitoring practices have been successfully implemented in La Plata Bahía Málaga. In Punta Soldado, a mangrove monitoring strategy has been implemented to track the natural regeneration rates of the ecosystem, and to identify both natural and human threats. This information is shared with environmental authorities to help prioritize key areas within the territory; this in turn aims to prevent illegal mangrove logging.

Since June 2024, peer exchanges have facilitated the exchange of knowledge and practices between *piangüeras* from La Plata and Punta Soldado, strengthening their collaboration on *piangua* monitoring and mangrove restoration efforts. These peer exchanges have been done through workshops, with the participation of *piangüeras* from both communities.

Payments for ecosystem services (PES) initiatives for mangrove forests

In Colombia mangroves are often overlooked by global climate initiatives such as REDD+, despite their carbon capture capacity being four times greater per square metre than that of continental forests (Donato et al., 2011). In Bahía Málaga, *piangüeras* have advocated for the inclusion of mangroves in the economic development strategies of such projects, with a particular emphasis on the participation of women.

The quantification and valuation of the contribution of mangroves to blue carbon sequestration in this region is still a challenge. Researchers have proposed exploring this issue together with the communities in order to include these ecosystems in projects based on payments for ecosystem services (PES) while highlighting the intrinsic values of the community to the ecosystem. PES projects are planned by the Ministry of Environment to secure mangrove ecosystem services, and the idea in general — to be remunerated for their conservation efforts — is welcomed by *piangüeras*. This initiative needs to be implemented carefully to avoid eroding women's intrinsic motivations for conservation, or losing rights to use and manage the mangrove forests.

Conclusions

Collective governance and cooperation for effective mangrove conservation

Piangüera women and mangroves share a profound, interdependent relationship, underscored by the critical role of *piangüeras* in mangrove conservation and sustainable management, and the vital importance of mangroves to sustaining their livelihoods. The experiences of *piangüeras* exemplify the potential of women-led, locally driven solutions in forest governance. Their efforts provide valuable insights for developing more resilient

and equitable approaches to forest management and conservation, blending traditional knowledge and community organization with innovative and supportive policies. This case highlights the need for policies and initiatives that recognize and support women's crucial role in environmental management. In this regard, policies should prioritize the following three areas.

Integration and cooperation

Coordination should be fostered among *piangüeras* in Punta Soldado, Bahia Malaga and the broader Eastern Tropical Pacific region to strengthen territorially integrated mangrove governance. This collaborative approach would facilitate the exchange of best practices and knowledge, enhancing women's conservation practices and roles in political processes and local decision-making. Funding support is essential for community organizations, local NGOs and research institutes. Additionally, targeted research is crucial in order to inform policy, as there is a significant gap in knowledge about mangroves along Colombia's Pacific coast and their social-ecological dynamics. Promoting cooperation among diverse stakeholders is vital to safeguarding the ecosystem, ensuring the provision of essential services, and advancing regional social and economic development.

Economic alternatives

It is essential to develop and support sustainable economic alternatives for women who depend on mangroves. This includes promoting community-based tourism, sustainable value chains, PES initiatives and other collective efforts, drawing on women's strong desire to share knowledge and learn from one another.

Women's participation

Women's participation in decision-making processes at all levels must be ensured, from local to national, so that their voices are heard in shaping the policies and actions that affect their communities. This includes implementing policies targeted to *piangüeras*, considering intersectional challenges, prioritizing capacity building, resource allocation and leadership development, and enabling women to fully engage in political and social processes.

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A young person from Punta Soldado monitoring a mangrove structure. Photo: Sebastián Montoya Calle

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1.2

Sun-drying maripa palm fruits prior to further processing.
Photo: Vanessa Hok

Saamaka *mujee* sustain the forest amid growing threats in Suriname

Samunda Jabini and Vanessa Hok

"Traditional roles and expectations of Saamaka women also contribute to limitations in participating actively in decision-making processes."

Village of Nieuw Aurora

Introduction

Suriname, in the Guiana Shield, is the world's most forested country, with a forest cover of 93%. The forest, containing immense renewable and non-renewable natural resources, houses four Indigenous tribes and six Afro-descendant tribes, including the Saamaka. Their 1.4-million-hectare territory has more than 70 villages, mainly along the Upper Suriname River. These people have developed a deep relationship with this habitat, and rely on the forest for sustenance, cultural identity and spiritual well-being. Forests are not used simply for food, medicine or building materials — they are crucial to Saamaka cosmology and social structure, which is formed by 12 lö (clans), and a matrilineal line of descent that determines lineage, inheritance and social status.

Saamaka *mujee* (women) have a very diverse and crucial role in upholding the existing social structure. They face various gender-related challenges, even in sustainable forest management, such as not being active in the decision-making process in forest management.

Gold and timber are also extracted from the interior of Suriname by small- and large-scale gold mining and logging companies. This puts immense pressure on the biodiversity of the area. These activities destroy the parts of the forest used by women to sustain their livelihoods, forcing them to travel farther away in search of new areas. Conflicts also increase due to the lack of effective legislation and insufficient coordination with stakeholders such as the local communities, who depend on the forest to sustain their livelihoods. Without adequate access to a healthy environment and natural resources, other critical aspects of a community's survival can be compromised (Dávila, 2021).

This article underscores the urgent need to recognize the crucial role of Saamaka women in sustainable forest management. By exploring the intersection of gender, territorial governance, traditions, and environmental stewardship, the authors address the gender-based obstacles that affect the livelihoods of the women who depend on the forest (International Land Coalition, 2024; Linga, 2022; VSG, 2023; Tropenbos International Suriname, 2017).

Traditional Saamaka authority, land use and management

The Saamaka territory (Figure 1 and Figure 2) is governed by traditional authorities: the Gaama (paramount chief), head chief (head of a lö), chief (head of a village), and basias (usually two assistants per chief are men and two are women). The families (bëës) identify a potential future chief or basia (Price, 1973). Through a sophisticated vetting process, this nominee undergoes a training process similar to an apprenticeship. On completing the

Figure 1. Saamaka Territory in Suriname
Source: Association of Saamaka Communities (VSG)

Figure 2. Saamaka communities spread across the districts of Brokopondo and Sipaliwini.
Source: Association of Saamaka Communities (VSG)

training, the Gaama is notified, and officially initiates the new member into the traditional authority on the recommendation of the community based on the line of succession. The traditional authority plays various roles that range from a social-cultural, legal/mediation, political and administrative nature to land use and management.

Traditional rules and customs govern land distribution, use and management. These rules have not been formally documented in the country's constitution nor acknowledged by the Surinamese government, which leads to disputes between it and the communities.

The roles of Saamaka women in their landscape range from caregivers, providers and mediators to leadership positions as traditional authorities. They are active in forest management in every part of their territory, but they face various gender-related challenges (Ramirez-Gomez et al., 2021; Tropenbos International Suriname, 2017). Often recognized as traditional stewards of their environment, these women are responsible for sustaining their families. They also possess deep knowledge about sustainable practices, passed down through generations, that nurture the ecosystems they are part of. Their deep connection to the land enables them to practise agriculture in a way that enhances biodiversity and contributes to the resilience of forest ecosystems. This includes shifting cultivation, clearing secondary forest, and cultivating diverse crops for a duration of two years maximum (after this period, they cultivate another plot; this allows the previous one to regenerate).

NTFPs in Brokopondo and Sipaliwini: from harvest to processed products

Forests are essential to ensuring community resilience to climate change. They provide food (e.g., agricultural products), water and income, and also have great spiritual and cultural significance for the Saamaka community. Saamaka women are the bearers of the knowledge of the forest, and actively contribute to the preservation of natural resources (Kanel, 2016). Everybody benefits from non-timber forest products (NTFPs), in their traditional cuisine, for cosmetic products or for medicinal use. In particular, Saamaka women rely directly on forests and NTFPs to sustain their livelihoods. The labour required to produce these NTFPs is mainly provided by women, and the products generate income for their families. NTFPs include medicinal plants, spice, fruits and berries, as well as oils extracted from nuts such as maripa (*Attalea maripa*), awara (*Astrocaryum vulgare*), amana (*Astrocaryum aculeatum*), palepoe (*Bactris gasipaes)* and podosiri or açaí (*Euterpe oleracea*). The Saamaka women do not initially cut down the palms that provide these raw materials, in contrast to what logging activities usually entail, which allows them to benefit from these resources in the long term. The knowledge of specific locations of NTFPs has been transferred from generation to generation, showing the awareness of preserving the forest for future generations. This article discusses how NTFPs are collected and processed in the communities of Pikin Slee, Nieuw Aurora and Brownsweg, which lie in Saamaka territory.

Pikin Slee

Women in villages in the Upper Suriname River basin have a specific method for collecting and processing NTFPs. According to our interviewees (based on contacts from Tropenbos Suriname) in the village of Pikin Slee, Saamaka women have used this method for generations; it forms the foundation of their traditional resource management strategies. Women harvest NTFPs according to what is available in their kapee (their family's designated harvesting area in the forest), where they find various species of palm trees that bear the fruits and seeds used to produce oils. Depending on the area the women can harvest different types of NTFPs. The NTFPs mainly collected by Saamaka women are maripa, amana, awara, and, less often, agbo sii and krappa (*Carapa guianensis*). All of them are seasonal crops. The women from Pikin Slee produce oils from the seeds of maripa and awara, and use amana's fruit pulp to extract oil. Most of the oils produced are for their personal use; only a small portion is sold due to limited sales opportunities (Village of Pikin Slee, personal communication, January 2025). Table 1 illustrates the periods when the Saamaka women in Pikin Slee collect this raw material.

Nieuw Aurora

In addition to a kapee near the village, some women in Nieuw Aurora also have a kapee across the river opposite the village, which means they must take a boat to reach it. In the extremely dry periods, the riverbed partially dries up, making it challenging to return to the village with a heavy load of collected fruits and seeds (see Table 2). Most of the oils produced are sold, based on customer demand (Village of Nieuw Aurora, personal communication, January 2025).

Table 1. Collection periods of NTFPs, village of Pikin Slee

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Maripa												
Awara	*											
Amana												
Medicinal plants												

*The collection of awara fruits commences in January and often continues throughout the year. Source: Vanessa Hok and Samunda Jabini

Table 2. Collection periods of NTFPs, village of Nieuw Aurora

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Maripa												
Awara												
Amana												
Agbo sii												
Krappa												

Source: Vanessa Hok and Samunda Jabini

Brownsweg

In Brownsweg, located in Brokopondo district, women harvest maripa in the forest near the community. They eat the pulp of maripa and produce oil from maripa seeds (Box 1). Most Saamaka women use maripa oil for personal use (e.g., cooking and cosmetics). According to sources from Brownsweg, there is both a local and coastal demand for maripa oil, with the latter showing an increasing trend. This creates opportunities for the women to cater to this market and generate more income. In the coastal area, companies such as Joab (a soap factory) use maripa oil to make soap and hair-care and skin-care products (Waal, 2023).

Box 1. Producing maripa oil

The production process for maripa oil is lengthy and most tasks are done by hand. First, the maripa fruit is dried in a pan on a wood fire or sun-dried. The dried fruit is then peeled, and the seeds are broken with a heavy metal object, such as an axe, to collect the nut inside. The nuts are roasted, pounded, mixed with water, and cooked in a large pan on a wood fire. This final step separates the oil and water. A 20-litre bucket of maripa seed produces approximately five litres of maripa oil.

Saamaka women's participation in decision-making processes

Women do not fully participate in decision-making, forest management issues and governance; decisions are made through traditional gender norms or patriarchal processes (Kanel, 2016; Peters et al., 2019). For example, kuutus are village meetings with participation by traditional authorities. Due to their workload women are not always able to fully participate in these meetings, which sometimes also cover forest management issues.

The public role of women is generally seen as being community service and family care. Saamaka women usually do not assume a public role in governance, although they have informal influence at a governance level. It has been customary, however, for community leaders, particularly men, to turn to the elderly, usually women, for advice.

Miss Naana (2022), a traditional leader in the village of Semoisi, shared what she learned about Saamaka women in governance: *"When I was a young girl, living with my grandmother, I noticed that chiefs and basias would always visit her early in the morning. I was curious, and my grandmother explained that she was advising them regarding important decisions. She also mentioned that she was not the only woman that was advising community*

leaders. That is when I learned that women do have an important role in governance, but many young women do not know this."

It has become apparent that many young Saamaka women were unaware of this vital private role of women in governance. The young women who heard this story from Miss Naana didn't agree with this merely "private" role. They would rather be publicly acknowledged for their contribution to governance. This information was shared by Saamaka women during a workshop facilitated by Tropenbos Suriname (Jabini, 2024).

Challenges that affect women's livelihoods related to NTFPs

In general, the Saamaka women need to walk vast distances, sometimes for up to three hours, to reach their kapee. Continuous community expansion (resulting in partial deforestation) affects the distance that women must travel into the forest to reach a suitable kapee. When they return to the village, women must carry heavy loads (at times up to 50 kg) of collected seeds on their heads. Walking long distances in various weather conditions is physically taxing. Sometimes women use a wheelbarrow. Other times they pay someone with a tractor or motorcycle to help carry the load. This additional fee can affect the price of the end product.

Maripa palm fruits. Photo: Vanessa Hok

Another challenge noted by the women is the use of machines to process the seeds. Machines facilitate faster processing times, resulting in people collecting more raw materials than usual from the forest. This eventually leads to an additional strain on the forest and to scarcity of the NTFPs.

There has been a noticeable increase in small-scale gold mining operations near Brownsweg. Many farmers plant agricultural crops for subsistence and commercial purposes in this area. Making things worse, women are not included in the decision-making processes regarding the set-up of gold mining sites, causing their voices to be lost. Nowadays, small-scale gold miners often start their operations near the communities, which threatens sustainable livelihoods and often results in conflict. For example, a piece of land shared among multiple family members may be used for both agriculture and mining activities, with the one overlapping the other. Mining can destroy existing areas of forest where the women collect the NTFPs, requiring them to travel to other kapee, which are often farther away.

How can women participate more equally in decision-making processes?

Traditionally, women played an important role in decision-making, but this practice has gotten lost over time, resulting in younger generations being unaware of it. Saamaka women agree that not being aware of the importance of women ancestors' voices in decision-making prohibited them from speaking up for women's interests. This sustained the pattern of women keeping to themselves and believing that governance is a man's job (Jabini, 2024).

To advance equitable decision-making processes, become more gender inclusive and achieve a better impact from community development projects, Tropenbos Suriname, within the Working Landscapes Programme, adapted their approach to better cater to the availability of women when planning and organizing activities in the local communities. This approach provides women with access to information, capacity building, technical guidance and practical tools, which are beneficial to both the communities and women's livelihoods. For example, scheduling training sessions on climate-smart agriculture best practices in the late afternoon instead of the morning allows women to tend

Agbo sii drying in a pan on a wood fire. Photo: Samunda Jabini

Amana palm fruits. Photo: Vanessa Hok

to their daily obligations while also actively participating in the community development activities, which includes kuutus, workshops and training sessions. And in order to maximize women's participation; for example, in leadership and governance workshops in the Upper Suriname River basin, Tropenbos Suriname organized the activities at a central location.

U Fiti is a women-run organization established in 2022. It promotes the active involvement of Saamaka women in decision-making through, for example, advocacy for land rights and ensuring that women's needs are being met in relation to landscape governance. The existence of this organization is a significant step toward reclaiming the traditional role of women in decision-making and having their voices heard in the discussions and decisions related to landscape management (Jabini, 2024). By including U Fiti in decision-making processes and collaborating with partners such as Tropenbos Suriname, the Association of Saamaka Communities (VSG) and other relevant stakeholders, Saamaka women's interests will be better protected.

Conclusion

The forest serves a range of purposes by providing food, medicine and building materials, and it holds immense spiritual and cultural significance for the Saamaka community. Led by ancestral laws and customs, these people have governed and managed their territory for more than three centuries. The lack of formal collective land rights for Indigenous and tribal people imposes a threat to sustainable land use. Women are often seen as traditional stewards of their environment, sustaining their families and serving as educators, passing down sustainable practices through generations. Even though the critical role of women is understood across the landscape, they still face various gender-related challenges. Women rely directly on forests and NTFPs to sustain their livelihoods, but are not always included in decision-making processes on land use and forest management. Other challenges they face include uncontrolled deforestation through mining and forest degradation through logging, causing them to travel longer distances to harvest NTFPs.

For women to equally and effectively engage in forest management, consideration needs to be given to their schedules and time availability; for example, when when planning a kuutu. This will enable them to participate

and let their voices be heard more clearly. Strengthening women's organizations for improved collective action and advocacy will also help to achieve gender-balanced engagement.

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Ba'Aka women camp in the Molembe forest, ROC.
Photo: Jean-Pierre Nguede Ngono

1.3

The participation of Ba'Aka women in the management of forest areas, ROC

Jean-Pierre Nguede Ngono, Laurence Boutinot and Christophe Baticle

In the forests of Likouala, Republic of Congo, Ba'Aka women play a crucial, often overlooked, role in the sustainable management of natural resources through their influence over their husbands.

Introduction

The participation of Ba'Aka women in the management of Likouala forest areas *(mpié or* or *billiè;* Boutinot et al., 2018) in the Republic of Congo highlights gender dynamics, Indigenous rights and environmental sustainability (see Box 1 for a list of local terms). As Indigenous people, Ba'Aka women play an important role in the management of forest resources, although their contribution to forest management policies is often underestimated. Indigenous women like the Ba'Aka have a deep local knowledge *(ebéngé)*, which is essential for sustainable forest management. This knowledge is passed down from generation to generation and contributes to the preservation of biodiversity and the balance of forest ecosystems. For example, women are often responsible for collecting non-timber forest products, such as medicinal plants and fruits, which are vital for their livelihoods and those of their communities ((Ebika et al., 2018). This dependence on forest resources underscores the importance of including women in decision-making processes regarding forest management (Brédif and Simon, 2014).

Studies show that the inclusion of women in natural resource management can lead to more sustainable and equitable outcomes (Hania and Graben, 2020; Thiombiano, 2015). For example, initiatives that integrate women into forest management programmes have demonstrated improvements in forest conservation and community food security (Jhaveri, 2020). This article reports on a study that explored the involvement of Ba'Aka women in the sustainable management of their forest environments, taking into account the cultural, social and economic dynamics specific to this community.

Context: Likouala and Ba'Aka communities

This article reports on a study in the Likouala department of the Republic of Congo, specifically in the villages of Yekola and Molembe, where Ba'Aka women play an important role in social, economic and cultural life. This region has a great wealth of forest areas, which are crucial both ecologically and economically. It is the second largest forest massif in the world, essential in the fight against climate change. But it is also a production forest that meets the world's needs for renewable wood resources. The Loundoungou-Toukoulaka Forest Management Unit covers 660,200 hectares. The governance of these resources remains a major problem, particularly with regard to the participation of Ba'Aka women. This specific context underlines the importance of this study to understand and improve the involvement of Ba'Aka women in the management of the forest areas of Likouala.

Ba'Aka communities: history and social organization

The Ba'Aka community is generally organized around extended family groups, where kinship ties play a central role in structuring society. According to the study's observations, important decisions, whether economic or social, are often made collectively, reflecting a strong tradition of participatory democracy. Family heads, associated in groups of elders respected for their wisdom and experience, play a crucial role in conflict mediation and resource management. This dynamic is reinforced by strong social capital, particularly among the great hunters or *nganga* (healers), which allows community members to help each other and collaborate in activities such as hunting, gathering, fishing and meal preparation.

However, the Ba'Aka's egalitarian social organization is being undermined by external factors such as alcoholism, resource exploitation, and development policies that ignore their needs and rights. This is all the more damaging given that a recent study revealed that the Ba'Aka possess extensive knowledge of mammal species, acquired over generations of interaction with their ecosystem (Gunn, 2024). This knowledge is not only essential to the survival of these species, but is also embedded in their culture.

These pressures can lead to social fragmentation and a loss of solidarity, making cooperation within the community more difficult. The Ba'Aka must therefore balance preserving their traditions with adapting to the new realities imposed by the modern world.

Research approach and methodological framework

The study's research approach and methodological framework focused on the participation of Ba'Aka women in the management of forest areas in Likouala in 2024 and 2025. The research was carefully designed to integrate social, cultural and environmental dimensions. Each of the homes was studied in terms of demographics, clans and subsistence activities in the forest. Participant observation provided an understanding of the daily

Box 1. Local terms

Ebéngé: the traditional knowledge or local ecological knowledge of the Ba'Aka, often transmitted orally

Makana: a word that could refer to focus groups or community meetings

Molembe:* in the Ba'Aka context this can refer to a sacred space or a community meeting place

Note: Molembe is also one of the two villages researched.

Moulongo: forest

Mpié or billiè: a term in the Baka and Aka languages designating forests or forest areas

Ndima: hunting area in the forest

Ndimba: natural environment

Nze: preparatory hunting ritual

Yekola:* in local languages, especially among the Ba'Aka and surrounding communities, this term can be associated with a ritual, celebration, or act of community sharing.

Note: Yekola is also one of the two villages researched.

practices of Ba'Aka women in the management of forest resources. The researchers immersed themselves in the Ba'Aka communities of Yekola and Molembe to observe women's daily activities (hunting, gathering forest resources, management, etc.), social interactions and the specific roles of women in the activities, rituals and cultural practices related to forest management and the exploitation of natural resources. The observations were subject to situational questioning.

The discussions *(makana)* addressed topics such as collective challenges to the management of forest areas (such as lack of access to land, conflicts over resource use) and women's resistance and adaptation strategies in the face of environmental and social issues.

Ba'Aka women's hunting and fishing activities

Ba'Aka women play an important role in the economic activities of their community, particularly through forest hunting *(ndima)*, gathering, agriculture and fishing. These activities are not only livelihoods, but are also integrated into their culture and way of life, reflecting a deep connection with their natural environment *(ndimba)*.

Hunting and gathering are fundamental traditional practices for Ba'Aka women. Although women do not participate in big-game hunting, they are at the centre of the preparations for this activity. A woman must bless her husband's hunting tools for the hunt to be fruitful. In a ritual that is done on the eve of the activity the woman spits on the hunting weapons and tools — the spear, crossbow, rifle or nets — invoking the gods of the forest to provide plenty of game and protect her husband from danger. This ritual, called *nze*, is connected with the ancestors living in the depths of the forest. For the wife of the village chief of Molembe: "*It is very important for us women to bless our husband's activity because the woman is directly connected with ancestors who fled to the forest, the only ones who can give or refuse game to the hunter.*" Hunting thus becomes an activity in which women occupy a central place and control its mystical character.

In addition, Ba'Aka women practise small-net hunting with their family in the forest. The nets are set up, and the family carries out a noisy hunt to drive the animals toward the nets. This is complemented by hunting for crocodiles. In the culture of the Ba'Aka, the crocodile occupies an important place in their diet. For them, it is the animal sent by *Komba,* the supreme god of the forest, to feed his community. The animal is supposed to allow itself to be caught, as if hypnotized by the Ba'Aka women. He is then grabbed and tied up without difficulty by the women. According to a woman from the village of Yekola: "*The crocodile is our meat sent by God to feed his people. To ban it today for conservation reasons is to kill us because all the knowledge we have to catch them will disappear*." Beyond the restrictions on the exploitation of certain animal species, Ba'Aka women are worried about the disappearance of their hunting knowledge and the connection with crocodiles.

Fishing is another important economic activity for Ba'Aka women. They fish in the region's rivers and lakes between January and May, using traditional techniques to catch fish and other aquatic resources. After targeting rivers full of fish, entire families make expeditions to the forest (*moulongo*) to fish there for long periods of time.

Picking activities

Additionally, Ba'Aka women are involved in the collection of non-timber forest products such as fruits, nuts and medicinal plants, which are essential for their nutrition and health.

Smoked fish, camp Mouloungou, Lands Kanounga. Photo: Jean-Pierre Nguede Ngono

NTFPs used by Ba'aka women: (l–r) black pepper, beans and forest caterpillars. Photos: Jean-Pierre Nguede Ngono

Products such as forest caterpillars, black pepper and other forest resources are also an important source of income. Women use their traditional knowledge to identify mushrooms, edible and medicinal plants, strengthening their role as custodians of biodiversity and local culture.

Although the Ba'Aka are primarily known for their hunter-gatherer lifestyle, agriculture plays an increasing role in their economy. In Yekola, women grow food crops such as cassava, maize and vegetables, which contribute to their families' food security. Agriculture is often practised in a complementary way to hunting and gathering, allowing women to diversify their sources of income and nutrition.

Women's perceptions of conservation and development policies

The Ba'Aka, as Indigenous people, have a close relationship with their forest environment. Their views on conservation policies are shaped by their direct experience of the impacts of these policies on their way of life.

In the case of the villages of Yekola and Molembe, located near the periphery of the conservation area controlled by the U.S.-based NGO Wildlife Conservation Society, which operates in Noubalé Ndoki Park, the Ba'Aka women believe that the forest has been taken from them. Above all, the BaÁka women object to the fact that their nets are often taken from them by eco-guards in the name of conservation. A young Ba'Aka gave her opinion on this in 2024: "*What will become of us when the eco-guards are sent to us to deny us access to our forest? We are abandoned to our fate without support*." The perception of the benefits of forest areas in Likouala differs among the various actors: Ba'Aka, conservation organizations and the State of Congo. Moreover, the Ba'Aka also express concerns about the impact of conservation policies on their traditional ways of life. As a result, the Ba'Aka continue to risk punishment, even corporal punishment, for using forest resources. And the authorities continue to pretend that the Ba'Aka can feed themselves without poaching.

Power and gender dynamics in natural resource management

Power and gender dynamics are influenced by socio-cultural, economic and political factors that determine how forest resources are managed and who benefits from them. Ba'Aka women play a crucial role in this dynamic, but their participation is often hampered by systemic inequalities.

One major factor is the economic dominance of neighbouring Bantu communities, who typically own the land and agricultural tools. As a result, Ba'Aka people — especially women — often work in subordinate and low-paid roles.

Additionally, women find it hard to resist the systemic discrimination from other Bantu communities in public schools, where the Ba'Aka girls are mistreated and sometimes abused. Women suffer from their families' fear of the school environment, which hinders them from developing new skills. As a result, they drop out of school more often than boys. Also, local schools that were dedicated to Indigenous populations lacked funding and ultimately closed in 2023.

Ba'aka women's participatory mapping workshop on NTFPs, village of Molembe, ROC. Photo: Jean-Pierre Nguede Ngono

In short, all Ba'Aka suffer from environmental protection measures that do not take their needs into account, and women face an additional layer of marginalization within and outside of their communities.

At first glance, community gatherings suggest a patriarchal structure, with men taking visible leadership roles and women marginalized. Take for example the study team's unexpected visit to the village of Toukoulaka in August 2024. There, the gender categories, from all the generations, were literally part of the reception. Invited to sit on the tree trunk used as a bench, under a clump of trees offering protective shade, the head of the community takes a seat next to the team members, surrounded by the most important men, also seated on either side on pallets forming seats. This is the first circle in terms of social status in front of strangers. The other adult men are nearby, to the left and right, joined by a few boys and teenagers. This is the second circle. Only three females are in this perimeter, and they are little girls, hugging each other, forming a sort of block.

The other women are a little farther to the right, close to the nearest hut. Just as attentive as the men to the team's presence, the women will not say a word, at least officially, simply talking among themselves. There are a few pre-adolescents in this third circle and some young children. A perfectly gendered order seems to reign without discussion.

However, it is the Ba'Aka women who, through the influence they exert on their husbands, dictate the latter's behaviour: whether to go work in the Bantu's field or to stay in the village, and whether to go hunting or to stay in the camp. This shows the women's extra layer of power within the gender dynamics of the Ba'Aka community. As James Scott (1990) noted, there is the facade of the "public text," but it is important to look at the resistance that hides behind it. Ba'Aka society may seem patriarchal, but in reality, it isn't. The same goes for the Ba'Aka gender structure: What is visible to outsiders may not reflect the deeper forms of agency exercised by women within their families and communities.

Conclusion

Consequently, to better integrate indigenous knowledge into the way of living in the forests, while protecting it, it would be wise to directly question the women, rather than remaining on the masculine surface of these Ba'Aka societies.

However, women's discretion in the eyes of outsiders is an obstacle. It is therefore important to do three things. First, allow the necessary time to gain women's trust. Second, involve women investigators, who can greatly facilitate the success of these investigations. Finally, by not confusing the gendered division of activities with de facto inequality, be aware of the importance of women as a strength in Ba'Aka groups.

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1.4

Seed exchange carried out by Korebaju women from ten reservations in the municipality of Solano, Caquetá. Photo: Tropenbos Colombia

Korebaju Indigenous women's knowledge, Colombia

Buen vivir and restoration of the Amazon forest

Mabel Martínez, Katherinn Lezama and Clara Hernández

Korebaju women — seeds of thought to harvest the good living of new generations.

Introduction

The municipality of Solano, in Caquetá department, is the second largest in Colombia, with an area of 42,736 square km. It is located in an ecological transition zone between the Eastern Cordillera and the Amazon plain. Despite the importance of this territory to the biological connectivity of the tropical forest and to the survival of the Indigenous peoples who live there, the municipality of Solano is threatened by the advance of the agricultural frontier, mainly represented by extensive cattle ranching (ICA, 2025; Melo Rodríguez, 2016; Tovar Zambrano, 1995), the planting of illicit crops such as coca (Ministry of Justice and Law, 2023; Ministry of Justice and Law and the United Nations Office on Drugs and Crime, 2015), and land speculation that stimulates deforestation (Parra, 2023). The country's armed conflict and the war against drug trafficking have been cited to justify the implementation of

forced eradication campaigns of illicit crops and the use of the herbicide glyphosate, generating serious damage to the land and communities (Morales and Beltrán, 2022), who have also experienced threatening events such as forced displacement, homicide and the disappearance of their families.

In 2019, Tropenbos Colombia began implementing the Working Landscapes programme in Solano, with the aim of promoting landscapes that are resilient to climate change. The programme has three pillars: inclusive governance, sustainable use of the territory, and conditions that support economic sustainability based on forest products. In 2020, Tropenbos Colombia, in order to consolidate and address the local knowledge of Indigenous women and men in the recovery and restoration of the forests of the Colombian Amazon, began a project under its Working Landscapes Programme to support 7 Korebaju indigenous reserves in the development of 103 initiatives. The programme uses the participatory productive restoration (PPR) approach, which seeks to increase the value of the forest, helping farmers and Indigenous peoples to maintain and restore it.

Central to the initiative was keeping in mind the intense transformation that the territory and its inhabitants have undergone and to build with the local communities a model for ecological and social restoration. This is based on the concept that it is necessary not only to recover the landscape and the environment, but also the well-being of the people. With the local people the programme designed ways of restoring areas that they prioritized according to their needs, such as restoring soils and water sources, improving food security, and increasing the supply of useful species, using local and traditional knowledge. To achieve this, it has been important to generate opportunities for governance at the municipal level, not only with government institutions but, above all, with discussions about good territorial management between peasant and Indigenous neighbours that promotes the inclusion of women in decision-making and territorial and social management actions.

This article discusses the experience of carrying out these actions to support Indigenous women. It shows how the systematic inclusion of women has helped project participants find more effective solutions and make important contributions that help the well-being and resilience of the community and the landscape.

There were three processes in which women played an important role:

- the development of a strategy for prevention of and attention to gender-based acts of violence;
- a process of strengthening seed management and the traditional cultivation system to promote food security; and
- the participation of women in restoration through the management of tree nurseries.

Restoring *buen vivir*

The role of Korebaju women in the care of the forest and healthy coexistence

Korebaju women emphasize the concept of *buen vivir* ("good living") highlighting the importance of conceiving the territory in an integral way, connecting the management of the *chagra*, the governance of the forest and the transmission of knowledge as part of a system that gives meaning to the landscape and guarantees its maintenance. The *chagra* is a traditional agro-food system of polyculture based on the ecological calendar, the practice of slash and burn to prepare the soil, the rotation of the cultivation area and the use of a wide range of food and medicinal species. These practices — in which women play a fundamental role — constitute a system of care for the territory itself that strengthens the harmonious relationship between the communities and the forest, offering well-being, improving the sense of belonging and ensuring affective ties within the family, community and territory. This can be seen in people's participation in promoting opportunities for healthy coexistence, based on approaches to the prevention and attention of gender-based violence.

Gender-based acts of violence

The ecological and social transformations experienced in the territory threaten this *buen vivir*, altering gender relations. Ecological changes, especially those caused by deforestation, have weakened cultural practices led by women, such as the management of *chagras*, whose diversity has been affected by the loss of seeds (Tropenbos Colombia, 2022). Social changes, provoked mainly by external forces such as the armed conflict, have weakened the complementarity between gender roles. This is due to changes in community dynamics, which are influenced by the norms and rules imposed by the former Revolutionary Armed Forces of Colombia (Truth Commission, 2022). This in turn has led to a social undervaluing of women's contribution to decision-making and to an increase in gender-based violence.

Given this concern, 20 Korebaju women from 10 communities focused the discussions in the project's workshops on the various types of violence they face, especially physical and psychological violence. During the workshops, the women were able to share with each other their emotional discomfort, conflicts in coexistence and obstacles to participating in the governance of the *resguardos* (areas with collective use rights).

This experience led to the development of a gender-based violence (GBV) care and prevention plan for the Korebaju communities in Solano, led by women, with the support of the Inter-American Development Bank and Tropenbos Colombia. Through local research in 10 communities, the women were advised by the *sabedoras,* women who are recognized as traditional authorities and bearers of ancestral knowledge of Indigenous communities. Together they identified various types of violence, including sexual, psychological, physical and economic violence. They developed a plan in community meetings, where strategies for family care and the strengthening of culture to prevent violence were discussed.

The participation of women in these strengthening of violence-free spaces has been key, allowing them to develop a collective discourse in the document *Voice of the Korebaju woman for good living* (Tropenbos Colombia, in press). It includes proposals on the care of the forest, water sources and tree restoration, which are particularly important for women. In addition, intergenerational learning centres were set up in each community for women to hold discussions and receive training on territorial care, forest governance, knowledge sharing and consolidation of support networks. These centres also function as safe places for women and girls.

Seed exchanges

Participatory productive restoration is a bottom-up approach that seeks to strengthen the knowledge associated with the forest through the development of intercultural dialogues and agreements for the elaboration of a joint vision on restoration that is based on local knowledge.

In Solano, PPR involved peasant and Indigenous women in the management of restoration actions in order to recognize their knowledge in tasks that have traditionally belonged to men. These actions strengthened women's participation in the environmental governance of the territory and in the development of a local economy with a gender perspective. The women also improved their capacities in the areas of human rights, indigenous rights and women's rights, accounting and administrative skills, and project formulation.

As part of this process, one of the key actions has been community seed exchanges. These efforts have increased the quantity and diversity of food and medicinal species in the *resguardos*, while at the same time strengthening the transmission of traditional knowledge.

Approximately 165 women and 25 men from ten Korebaju *resguardos* participated in the seed exchanges. The exchange prioritized the distribution of seeds to the *resguardos* with little or no seed availability in order to ensure the greatest diversity. The exchange of knowledge associated with the management of seeds has improved social cohesion, increased the participation of young women, and strengthened the role of the *sabedoras*. This is due to the recognition of women's knowledge of their production systems and thus their role in the food security of the communities. At the same time, the exchanges facilitate the transmission of traditional knowledge from older women to young women, helping to ensure its preservation. Seed exchanges are also a starting point for collaboration and community integration, as well as a strategy for local management of biological resources.

Currently, the Korebaju women maintain seed exchanges among the 10 Indigenous communities in Solano. At these meetings participants exchange information and engage in songs and dances about the traditional management of the *chagra*, improving cooperation and mutual care.

Women's leadership in forest restoration

The project's PPR initiatives included provision of native seeds for restoration, identification of biocultural criteria for Korebaju restoration, and economic valuation of the contributions of nature in the framework of PPR. A range of participatory activities were carried out in the communities, such as the establishment of 14 experimental family nurseries to grow trees for restoration efforts, which was a strategy based on the traditional ecological knowledge of the Korebaju. The dialogues and collaborative activities that emerged thanks to the experimental nurseries became "living classrooms" for the collective understanding and exchange of knowledge and for broadening the participation of adult women and men, older adults, children and young people.

During the implementation of the nurseries, it was observed that in the planning and production phases of plant-growing, women play various roles as caretakers, promoters and knowledge holders. It was identified that some practices — such as planting trees for consumption

and fuelwood, gathering forest products for handicrafts, management of firebreaks, transfer of traditional knowledge, seed storage, and care and irrigation of seedlings in *chagras* — are part of the daily activities that involve women and young people that are related to the procurement and production of seeds. This showed that activities concerning nursery management are intrinsically linked to women's traditional ecological knowledge and roles, which are centred on family and community care. The role of women in the care and production of seeds in restoration processes showed their deep connection with daily practices in the *chagra* and their rituals, which expand the cultural richness and planning of restoration in the territory (Lezama, 2024).

For example, women play a crucial role in the supply of seeds for *chagras*, participating in the collection, sowing and harvesting of seeds for food and cultural purposes; thus their daily work is linked to nursery care and seed procurement. According to the project's experience, aligned with de Siqueira et al. (2021), seed production led by women proves to be more effective and biodiverse than that led by men, as it fosters collective participation and helps to resolve conflicts by being prone to conciliation, thus contributing to the sustainability of restoration processes and therefore, to the resilience of the territory. This is because women's decisions are less individually oriented and more socially oriented, as they tend to satisfy household consumption needs first (Villamor et al., 2014; Lezama, 2024).

Another significant contribution to resilience is in the selection of seed species for restoration. The selection of species for restoration by the *sabedoras* aligns with the criteria of diversity, use and quality, referencing detailed knowledge of planting practices, as well as the physical and cultural uses of more than 400 species of Amazonian plants. The Korebaju women prioritized species with a range of purposes; i.e., timber, cultural, medicinal, among others. This traditional role of Indigenous women is also observed in their practices of collecting useful tree species from forests, and domestication of plant species for the *chagra* (Van der Hammen and Rodríguez, 1996), and for the selection of seed source species in restoration.

Women's participation in forest management is most effective when plant production activities are not added as an additional burden to their traditional community tasks. Although caring for nurseries can be a strategy for gender equity in restoration, these tasks can fall disproportionately on women, youth, girls and boys, compared to men. In the Korebaju territory, however, around 30 women easily adopted family nurseries, sharing responsibilities with their sons and husbands for irrigation and pest control, and promoting the transmission of indigenous knowledge. The challenge is to ensure that women's empowerment is based on equitable relationships and conditions that favour economic, social and family well-being, beyond individual needs, and integrating women fairly into forest management, use and conservation (Carnegie et al., 2019; Lezama, 2024).

Conclusions

Women's participation in forest governance has reduced gender gaps and facilitated their inclusion in the decision-making processes of the traditional and political governance of their communities. These actions, supported by Tropenbos Colombia, have also included the creation of a plan for *buen vivir* that addresses the awareness and prevention of gender-based violence, making visible the violations suffered by women in a context of social and environmental change.

The Korebaju women have demonstrated that women's leadership is key to the restoration of the Amazon forest and to collective well-being, given their fundamental role in seed provision and conservation of local biodiversity. Their active participation in the selection, collection and planting of species for restoration not only reflects their deep ecological knowledge, but also their strong commitment to community care.

The inclusion of women in forest management and conservation must take place in conditions that

A seed exchange in the municipality of Solano, Caquetá. Photo: Tropenbos Colombia

favour their active participation, based on equitable relationships that support social, economic and family well-being, without adding to the traditional tasks they already perform. In this way, women's traditional ecological roles can contribute to the sustainability and resilience of the territory, integrating ancestral knowledge with modern restoration practices. This facilitates the long-term conservation of natural resources and the good living of Indigenous communities.

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FEATURE ARTICLE

Quijos women's forest conservation initiatives in Amazonian Ecuador

Roxana Tanguila, Lourdes Jipa, Gonzalo Alvarado, Gisela Yumbo, Patrick C. Wilson, Andrea M. Cuéllar, Cheryl Martens and Florencio Delgado Espinoza

Introduction

The upper Amazon area of Ecuador is one of the world's biodiversity hotspots, a vital ecosystem where the eastern foothills of the Andes give way to the Amazon basin. It is also the ancestral territory of the Indigenous Quijos Nation, comprised of approximately 25 communities in a discontinuous territory in Napo Province, with most concentrated in the *cantones* (counties) of Archidona and Tena (see Figure 1). Most members of the Quijos Nation reside in rural communities in the forest and historically they have pursued subsistence practices centred on shifting cultivation in forest gardens (*chagras*), gathering forest resources, and hunting.

> *"Only the oldest women retain the ancestral knowledge of gardening. Practically speaking, the chagra is the heart of all things that flourish within a community."*
>
> Roxana Tanguila, Sacha Awana researcher

Preparing and eating maito at a workshop in a chagra. Photo: Andrea Cuéllar

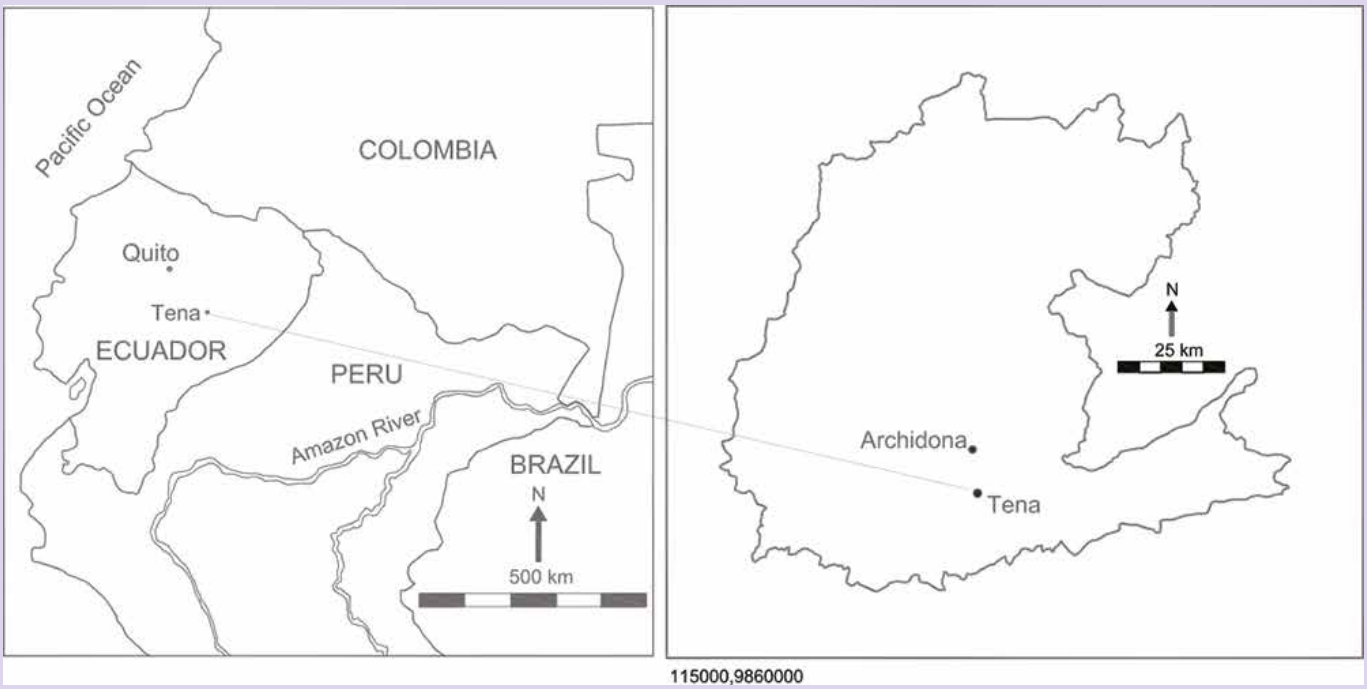

Figure 1. Napo Province, Ecuador. Source: Andrea Cuéllar

Yet, since the 1960s and accelerating rapidly in recent years, traditional land use and management practices have been under threat due to territorial fragmentation and loss of land, the expansion of the cattle ranching frontier, and extractive industries. These multiple threats have compelled Quijos leaders to form Sacha Awana ("Building from the Forest," in the Quijos language of Shillipano), an Indigenous research team promoting a gender-based research agenda that prioritizes the role of women gardeners, or *chagra mamas*, in the activation of Quijos Traditional Ecological Knowledge (TEK). Together, the team members are working to revitalize chagra agroforestry (forest garden cultivation) and halt forest degradation while contributing to food sovereignty and sustainable forest management.

Struggles of the Quijos Nation

Members of the Quijos Nation, like most Indigenous Amazonian peoples in Ecuador, face serious threats to their territorial rights and sovereignty, challenges that have only become more pressing in recent years (Box 1).

Agrarian reform in 1964 opened much of the Ecuadorian Amazon to colonization, cattle ranching and logging (Macdonald, 1984). Hydrocarbon extraction since 1967 has had severe environmental consequences while accelerating territorial losses suffered by Indigenous peoples (Sawyer, 2004).

Most recently, illegal gold miners have used threats of violence and exploited the economic vulnerability of many Quijos families to coerce them into allowing mining operations on Quijos lands. The toxic chemical tailings from mining activities pollute the land and rivers, which the Quijos rely on for food production, drinking water, bathing and fishing, with severe health and environmental consequences (Etchart, 2022). Territorial loss and land degradation have a particularly harmful impact on women's productive practices in their forest gardens, as effective gardening is dependent on a healthy forest environment. These experiences expose the gaps and

Box 1. The Quijos Nation

The Nación Originaria Quijos (NAOQUI) is a recently reconstituted Indigenous nationality in Ecuador, receiving formal ministerial recognition in 2013. Leaders and members, however, trace their ancestry back to pre-Colombian Quijos chiefdoms (Cuéllar, 2009) and the Quijos leader Jumandi, who led a rebellion against Spanish colonizers in 1578. While the uprising was ultimately unsuccessful and Jumandi was captured and executed, his memory lives on in the upper Amazon as an important inspiration for the Quijos people.

limitations under Ecuador's Constitution, which ostensibly protect the rights of nature and the right to a *sumac kawsay* (good life).

Illegal gold mining. Photo: Roxana Tanguila

Indigenous knowledge systems and traditional ecological knowledge as pillars for empowerment

Human rights violations, socioeconomic stressors and environmental pressures have prompted Sacha Awana researchers and their social science collaborators from the University of Lethbridge (Canada) and the Universidad San Francisco de Quito (Ecuador) to initiate research on Quijos ancestral knowledge and socio-ecological restoration. Their project builds on the growing recognition that the activation and application of Indigenous Knowledge Systems (IKS) and Traditional Ecological Knowledge (TEK) are essential to biodiversity management and climate change mitigation. IKS and TEK help decolonize land-use policy, benefiting Indigenous peoples in their struggles to achieve greater territorial sovereignty.

The research team's long-term goal is to create Quijos-centred "Life Plans." Broadly conceived, these are culturally informed land-use and management plans that are rooted in Indigenous concepts of living well (Grefa et al., 2024). They represent alternatives to State-directed planning models that have proven ineffective in achieving sustainable land management and have marginalized Indigenous peoples, their knowledge systems, and their land-use practices (Harring, 2015; Macdonald, 1984). The pillars of Indigenous Life Plans are IKS and TEK, and they amplify local ecological knowledge, biocultural heritage, and socially inscribed relationships to the land as pathways to biodiversity enhancement and sustainability — in essence, the social component of ecological restoration.

This initiative by the Quijos Nation is timely and urgent, as IKS and TEK are at risk and in decline. Land loss and limited territorial sovereignty exacerbate the socio-economic marginalization that is a consistent feature of life for members of the nation. This, in turn, accelerates environmental degradation, as economic desperation leads more people to sell land or grant concessions to extractive industry. This vicious cycle erodes IKS and TEK, as members of the nation lose control of the territorial foundation on which they can enact their land-based livelihoods in accordance with their IKS and TEK (Fernández-Llamazares et al., 2021). These compounding stressors on IKS, TEK and traditional land-use and management practices lead many Quijos women to question the future of the *chagra* economy and the utility of transmitting their gardening knowledge to their daughters and granddaughters.

Gendered dimensions of land governance problems

The research and advocacy of Sacha Awana have two main dimensions: to train and promote women as leaders of the Quijos Nation, and to pursue formal title to land. The team members recognize that the challenges of land fragmentation and lack of territorial sovereignty are worsened by the gendered nature of decision-making on property and territory. Agrarian reform imposed a patriarchal private-property regime on the Quijos people by titling land to men who were heads of households, leading men to dominate decision-making on property and territory.

Pressing economic needs regularly compel men who are heads of households to sell a portion of the family's property or to receive payment to permit illegal gold miners to work on their land, often without consulting their women kin or contemplating the consequences of this land fragmentation for the *chagra* economy. Some of the older *chagra mamas*, who remain dedicated to their forest gardens, find themselves subjected to threats by younger men in the community, who want them to remain silent in their opposition to making deals with gold miners. In addition, once the miners are established and working on adjacent lands, they regularly steal food from the *chagras* for their personal consumption, or in the case of cacao, harvest it to sell in the market for additional income.

> *"Here in Napo Province, and possibly in other parts of Amazonia too, the men make all of the decisions around construction projects or mining activities, legal or illegal, affecting our communities, pushing women's voices and interests to the side."*
>
> Roxana Tanguila, Sacha Awana researcher

Often, given the immediacy of their economic needs, Quijos men heads of households do not consider the broader implications of dividing property for the nation's territorial integrity. Many of the communities that are members of NAOQUI are constituted under individual property titles, meaning that each family has title to their own land. This makes the nation susceptible to internal division and land loss, as individual families can choose to sell part or all of their land or grant concessions to mining companies without oversight from the community as a whole. According to Lourdes Jipa, President of NAOQUI and Sacha Awana researcher: *"When the communities do not have collective title to land; when land titles are granted to individual families, they sell their land. This is one of our greatest worries here in Napo, that we have a lot of territory without collective title. So right now, one of our struggles is to demand that our public institutions help us so that our territories can be legalized collectively. That is, if we hope to preserve much of our territory. If not, people are just going to continue to sell their land and will continue moving further and further into the margins. And look, when that happens, the land is transformed into a [food] desert: there are no edible fruits; there are no medicinal plants; this is the reality."*

Chagra mamas *giving a gardening workshop. Photo: Andrea Cuéllar*

Sacha Awana and the Quijos Nation Governing Council are working to encourage Quijos communities to pursue collective, rather than individual, title to land, a right available to Indigenous communities under Ecuador's *Law of the Communes*. Collective land title provides protection against territorial fragmentation, as all members of a community must agree to any proposed land transaction. This is of pressing importance for work to revitalize forest gardens and Indigenous forest management practices, as the capacity of the Quijos to perpetuate forest gardens and the knowledge systems that enable them is contingent on retaining a sufficient territorial base. This allows for shifting cultivation, with periods of fallow and forest regeneration.

Quijos women's gardening knowledge

Another area of Sacha Awana research is focused on the intergenerational transmission of Quijos women's ancestral gardening knowledge. Multi-generational, land-based workshops in forest gardens provide older *chagra mamas* with the opportunity to share their gardening knowledge with the next generation of Quijos gardeners. This is particularly important in order to counter the decline in women's IKS and TEK and to pass along gardening knowledge to young Quijos women that they may not have received from their mothers.

One July morning in 2024, 25 members of the Quijos Nation (20 women and 5 men) and two research collaborators from the University of Lethbridge and Prentice Institute walked from the nearest road to the *chagra* that would be the site of that day's workshop. On their way, they passed through property that used to be owned by a Quijos family, but was lost as collateral to a bank loan they were unable to repay. As is all too common in the region, the land was purchased by a non-Indigenous investor and transformed into pasture for cattle ranching. Leaving the pasture behind, the group soon entered a forested garden space: a *chagra*.

The participants brought some food with them to prepare *maito*, a typical dish of fish wrapped in *bijao* leaves and cooked over a wood fire. This was complemented by a wide array of foods they collected from the *chagra*: manioc (cassava) and plantains, taro, heart of palm, wild peanuts, oranges, mandarins, other fruits and seasonings, and hot chili peppers for a dipping sauce.

As the participants cooked the now bountiful food, the *chagra mamas* shared stories about *chagras* and women's labour and ancestral knowledge. After the feast, the *chagra mamas* invited all of those present to join in a demonstration of the correct planting techniques for manioc, a staple of Quijos cuisine.

Forest converted to pasture for cattle ranching. Photo: Andrea Cuéllar

In women's ancestral *chagra* management practices, effective gardening involves not only the technical aspects of planting, weeding and tending to the plants, but also ceremonial practices, songs and supernatural knowledge considered essential to the health and vitality of the gardens. In fact, the most effective gardeners are so because they have acquired strong *paju*, a mastery of garden knowledge and magic understood to be crucial to forming positive reciprocal relationships with the spirits of the various garden crops. Thus, the demonstration included not only the technical aspects of planting, but the requisite ritual elements as well.

Forest converted to pasture for cattle ranching.
Click here to see the video

Chagras and biodiversity management

Quijos forest gardens, like those of many Indigenous Amazonians, are not simply productive spaces that generate food for the domestic economy, but also areas of enhanced agrobiodiversity (Vera Velez et al., 2019) and centres of cultural production and reproduction that are part of the tropical forest landscape. As such, they are socioecological niches of biocultural significance and cultural keystone places (as defined by Lepofsky et al., 2020) that inform Quijos relationships with the forest.

Chagras are patches of forest that are cleared and cultivated for a number of years (typically 8 to 15) and then allowed to lay fallow, permitting the forest to regenerate. The patches are not clear-cut from the forest; rather, a variety of tree species and other plants with use or aesthetic value are left untouched and encouraged to thrive in the garden setting. A typical Quijos garden contains more than 100 species of domesticated, semi-domesticated and wild plants that are cultivated and/or encouraged to grow. Some are grown as food sources for humans and wild animals; some as medicines; and some simply for their beauty. By providing food for a variety of forest animals, they simultaneously help sustain wild animal populations and draw them closer to human settlements, facilitating the hunting economy.

Lourdes Jipa collecting hot chili peppers. Photo: Andrea Cuéllar

Quijos gardens are classic examples of Indigenous biodiversity management strategies, whose cumulative effects are believed to be instrumental in the continued evolution of

> *"A forest managed in our traditional ways, including by* chagra mamas *through their gardening practices, is a healthy forest, a biodiverse forest full of food. An abandoned forest, or a degraded forest, becomes a food desert, a space without resources to sustain people or animals."*
>
> Gonzalo Alvarado Tanguila, Sacha Awana researcher

Participants in a manioc-planting workshop.
Click here to see the video

Amazonian forest biodiversity (Balée et al., 2020). It is not, therefore, accidental that chagras have been demonstrated to enrich genetic diversity (White and Monteros Altamino, 2024) and that they enhance floral and faunal biodiversity as cultural legacies legible in regenerated forest. More generally, the fact that a large proportion of the planet's biodiversity is found on the traditional lands of Indigenous peoples (Ellis et al., 2021) speaks to the positive association between biodiversity and land management practices such as chagra agroforestry.

> *"When our territories are sold, our cultural practices die, as does the spiritual space that connects us with our Mother Earth. That is why we must fight to protect our land and our territory in the Amazon."*
>
> Roxana Tanguila, Sacha Awana researcher

Quijos *chagras*, as is also common elsewhere in Indigenous Amazonia, are cultivated and maintained primarily by women. This makes the gardens centres of women's social interactions and context for the production and reproduction of gender-specific ecological knowledge. Where these gardens remain vital, they serve as the foundation of Quijos food security: a productive garden can fully provide a diverse and healthy diet for the family who tends it. So close is the association between a woman and her *chagra* that the forest gardens come to stand as a testimonial to women's productive labour and the external physical manifestation of her social being (Guzmán-Gallegos, 2021). Women are bound to their cultivated plants in kinship relationships (Guzmán-Gallegos, 2021; Descola, 1994), and they implement and transmit their gendered TEK in the physical space of the garden, making their technical and ritual knowledge inseparable from land-based practices. This makes the *chagras* living laboratories.

Gender-based approaches to socio-ecological restoration

According to Lourdes Jipa, President of NAOQUI and Sacha Awana researcher, "The only ones who are fighting for the land are the Quijos women. My mother, for example, cannot go one day without visiting her chagra. She says that in the chagra she feels well. It is there where she connects with nature, with the plants, and when she is there, all the sadness, suffering and pain disappear. It is a spiritual connection that Quijos women have with their territory — women's relationships with the land is based in fertility: our fertility as women is tied to the fertility of the land, and without the land's fertility, we, as a people, would not exist."

While the positive associations between Indigenous forest management and the preservation of forest biodiversity are increasingly clear, the ability of Indigenous peoples to effectively carry out their management practices requires them to have greater sovereignty over forest management and resource use, and greater gender equity in decision-making processes.

There are two preliminary conclusions from the Sacha Awana research. First, there is the need to strengthen the territorial integrity of the Quijos Nation through collective land titles for Quijos communities, while ensuring that women have greater voice in decisions on territory and land-use practices. Second, work must continue to incentivize and incorporate women's traditional ecological knowledge for forest conservation through revitalizing Quijos *chagras* and their associated forest management. Quijos women have demonstrated their central role in forest conservation and biodiversity management through their gardening practices. The work of Sacha Awana seeks to empower women to contribute their vital TEK to the work of sustainable forest management.

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Section 2

Meaningful participation of women

Previous page: Woman picking plants in laman Satong, Indonesia. Photo: Irpan Lamago

A Korebaju woman participating in *buen vivir* ("good living") socialization exercises, Caqueta, Colombia. Photo: Maribel Valencia

2.1

From the margins to management

Unlocking women's power in forest landscapes

Sara Johnson Gutiérrez, Maria Clara van der Hammen, Marlene Soriano, Getrude Owusu, Irene Koesoetjahjo, Pura Suarez and Trudi van Ingen

Introduction

Across many forested regions, women — particularly rural and Indigenous women — are systematically excluded from land and resource governance. This is driven by a complex mix of socio-cultural norms, institutional frameworks and economic inequality (ONIC et al., 2022). These overlapping dynamics restrict women's access, voice and control, while also increasing their vulnerability to the pressures of landscape degradation, climate change and deforestation.

"I took a loan from the VSLA to venture into vegetable farming. The benefits have helped me pay my children's school fees and reinvest in my cocoa farm."

Project participant

Yet women often hold unique relationships with forests, shaped by their responsibilities for food, fuel, medicine and caregiving (Agarwal, 2009). These perspectives involve different forms of knowledge and skills that can improve conservation outcomes (World Bank, 2015; Lescourret et al., 2015). While stronger evidence is still needed on the environmental benefits of inclusion, women's involvement has been linked to more holistic land

stewardship — supporting biodiversity, food security and sustainable livelihoods (Rocheleau et al., 2013; FAO, 2016).

Despite their contributions, women's roles in sustainable land management remain undervalued — both socially and in funding priorities (Gumucio et al., 2020). But momentum is growing; around the world, rural women are claiming recognition and rights. Their leadership presents a powerful opportunity for landscape approaches to become not only more inclusive, but also more effective. As the following case studies show, gender-sensitive and gender-transformative strategies can unlock mutual gains across environmental, social and economic goals (van der Hammen et al., 2023). These cases, from projects of various Tropenbos International network members, show what's possible when women are meaningfully included in landscape management. Through a gender cross cutting approach, the network aims to support women in frontier landscapes (see Box 1). This article spotlights strategies that can be adapted to a range of landscapes and contexts.

Box 1. A gender cross-cutting approach

Tropenbos International represents a global network of organizations that work in frontier landscapes across Latin America, Africa and Southeast Asia, affecting approximately 243,000 people and 16.4 million hectares (TBI, 2024). Since 2019, the network members have collaborated to mainstream **gender (and youth) inclusion as a thematic cross-cutting programme priority** (TBI, 2025). This is applied across three core pathways of change: landscape governance, business and finance, and sustainable land-use practices. A set of five indicators support strategy development, track progress and facilitate peer-to-peer learning across the network. These indicators are scored on a range from 0 to 5, indicating community perceptions of and experiences with each indicator in their landscape.
These are the five indicators:

a. access to land and ecosystem services
b. land tenure/security
c. active and legitimate participation in decision-making in land and forest use and governance
d. access to production resource, inputs and benefits
e. participation in, contribution to, and benefits of climate-smart practices

Figures 1 to 4 show how these indicators were scored in the four communities. The practitioners (TBI staff) scored the indicators based on their interactions with and observations of the communities.

Lomerían women's integration in territorial governance

Chiquitanía region, Bolivia

The Indigenous territory of Lomerío, in Bolivia's Chiquitanía region, contains the largest tract of neotropical dry forest in the Americas, home to unique flora and fauna (Portillo-Quintero and Sánchez-Azofeifa, 2010). Governance is led by the organization CICOL, and reflects patriarchal structures common in many Indigenous nations. Women have historically been excluded from leadership, with those who are elected often dropping out within the first year due to lack of transportation, caregiving burdens and weak institutional support (IBIF, 2023). This unintended exclusion contradicts Lomerio's own territorial Life Plan, which includes a commitment to internal gender equity.

When Instituto Boliviano de Investigación Forestal (IBIF) began working in Lomerío, it initially had little gender-specific expertise, but it integrated a gender perspective into its institutional framework and co-led a participatory, territory-wide gender diagnosis. This process laid the foundation for the first territory-wide women's meeting, convened by CICOL's gender *cacique* — a traditional authority figure elected to represent women's interests within the territorial governance organization. Women at the meeting collectively decided to create the Indigenous Monkox Women's Organization of Lomerío (OMIML).

Within three years, women secured consistent participation in CICOL's weekly governance meetings and began to contribute to territorial decision-making. IBIF supported OMIML in drafting its internal regulations, accessing funding, and implementing projects. It also promoted the organization's participation in regional dialogues and exchanges, which helped raise its profile and accelerate its impact. See Figure 1.

By 2024, OMIML's access to land and ecosystem services had improved significantly (see indicator a in Figure 1), supported by formal rights to manage a 200-hectare forest area. These gains were made possible through the group's strong coordination with CICOL and support from its general *cacique*, the head authority of the territorial government, both of which were crucial to ensuring institutional backing and legitimacy.

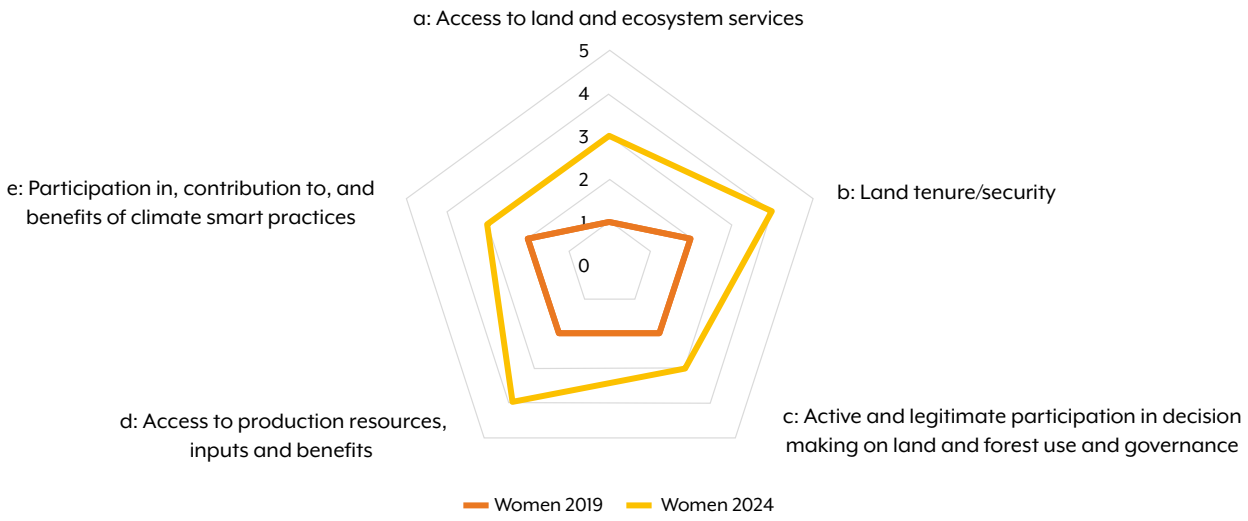

Figure 1. Indicators of gender transformative change among Monkox women in Lomerío, Bolivia, 2019 and 2024
Note: Numbers of 0 to 5 are scores of the five indicators (a–e).

At the same time, Lomerío's security over its share of the TCO Monte Verde — a large, collectively held Indigenous territory — also improved (see indicator b in Figure 1). OMIML's technical team accompanied CICOL in assemblies and negotiations with other Chiquitanían groups (Paikonecas and Chiquitanos) to advocate for approval of Lomerío's forest management plan. The plan's approval strengthened land tenure, ensuring access and rights for both the territory and the women's organization.

Together, these developments reflect how targeted support, engaging traditional leaders, and collective mobilization enabled women to make governance gains within one of Bolivia's most ecologically and culturally significant forest landscapes.

Enhancing participation by Indigenous women

Solano landscape, Colombia

In the Amazonian landscape of Solano, Colombia, Indigenous women have been working to gain meaningful participation in the governance and management of their territories. Historically, this has been limited by geographic isolation, the impacts of armed conflict, and governance systems that adopted patriarchal forms through interactions with state and external actors. As a result, women's perspectives, traditional knowledge and priorities have often been excluded — despite their vital roles in sustaining the land.

Responding to women's requests for training, Tropenbos Colombia (TBC) helped establish meetings where women could gather, exchange knowledge and articulate their priorities. These meetings created a platform for sharing traditional practices in landscape management and for developing a collective agenda for participation in governance. With training in Indigenous and women's rights, project development, and leadership provided at the meetings, participants gained tools to strengthen their presence in local and regional decision-making.

These efforts extended into the Asociación de Autoridades Tradicionales Indígenas del Municipio de Solano Caquetá (ASIMC), the broader Indigenous umbrella organization, which brings together multiple reserves in the Solano landscape. Women began forming governance committees at the community level, and eventually established a regional committee. In parallel, TBC organized dialogues with men who were leaders and elders, focusing on gender roles and traditional values of balance and equity. These sessions fostered new understanding among men about the benefits of inclusive governance for both social resilience and environmental sustainability.

The outcomes have been significant. Women are now serving as village heads, treasurers and secretaries of environmental affairs. Their collective action has enabled them to advocate for issues such as food security, forest restoration and water source protection. They have also taken the lead in formulating and managing projects, securing funding for seed preservation and building "women's houses" — places dedicated to knowledge-sharing, sustainable agriculture and forest care (see Figure 2).

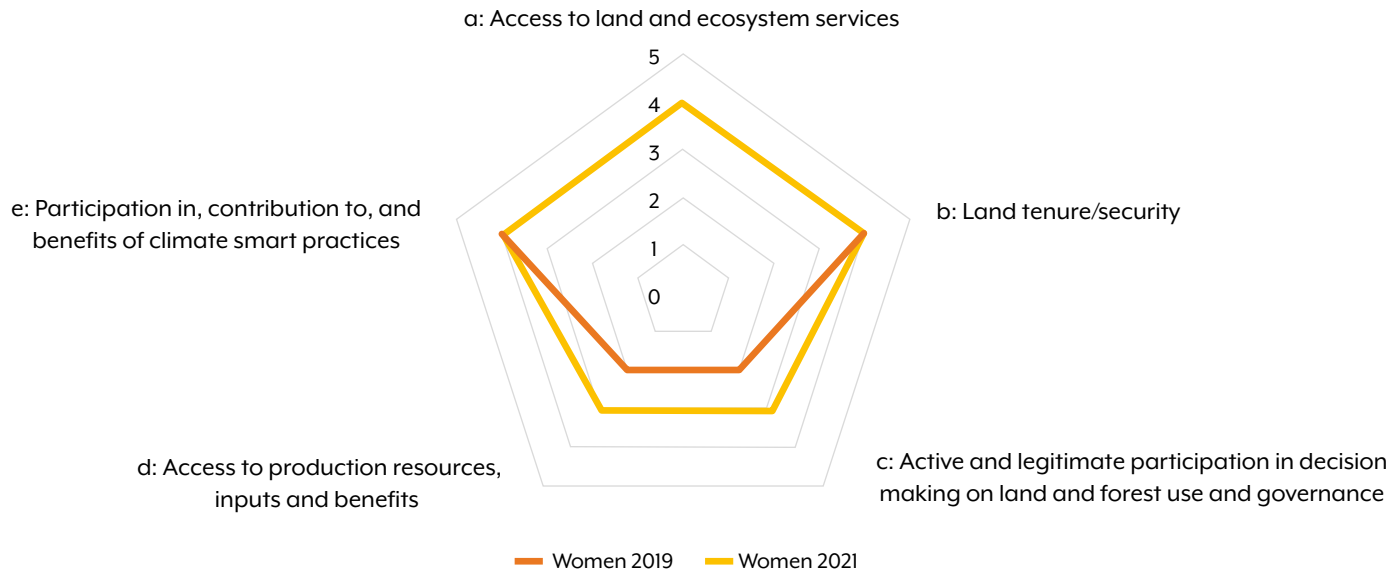

Figure 2. Indicators of gender transformative change among Korebaju women in Caquetá, Colombia, 2019 and 2021
Note: Numbers of 0 to 5 are scores of the five indicators (a–e).

The scores on participation indicators (see indicator c in Figure 2) reflect this shift. By 2021, women's access to decision-making and resources had risen. Indigenous women are now calling for further training in law and policy to scale their engagement at municipal, regional and national levels.

The Solano experience illustrates how creating opportunities for women to organize — supported by training and dialogue with traditional leadership — can catalyze shifts in governance that benefit both community cohesion and environmental stewardship.

Improving women's access to VSLAs

Ghana's Juaboso-Bia and Sefwi Wiawso landscapes

In Ghana's Juaboso-Bia (JB) and Sefwi Wiawso (SW) landscapes, rural women face significant financial barriers that limit their participation in sustainable agriculture and household decision-making. Access to formal financial institutions is limited, interest rates are often prohibitively high, and conventional lending conditions rarely favour women. Many women who are cocoa farmers resort to informal lenders who charge interest rates as high as 100%, creating cycles of debt that constrain livelihoods and land stewardship (TBG, 2023). These financial obstacles contribute to unsustainable land-use practices, exacerbating deforestation, biodiversity loss and land degradation.

To address this, Tropenbos Ghana (TBG) introduced Village Savings and Loan Associations (VSLAs) in selected communities across the two landscapes. These groups provide flexible, community-based financial services, allowing members to make weekly savings contributions, borrow funds at low interest (around 5%), and receive annual dividends. The VSLAs addressed longstanding financial exclusion and enabled investment in climate-smart cocoa farming. Women diversified into vegetable production and small-scale trade, while some expanded their cocoa farms — strengthening food security and economic resilience (TBG, 2023) (see Figure 3).

As the VSLAs demonstrated success, community acceptance grew. Some members who had received training began supporting the formation of new groups in nearby communities. The initiative has expanded to 36 VSLAs since its inception in 2022, with more than 1,000 members, 76% of whom are women. This reflects both the model's reach and the active role that women continue to play in driving its growth and impact.

The impact extended beyond finance. VSLA membership significantly improved women's access to farm inputs and production resources (see indicator d in Figure 3). These gains illustrate that financial inclusion was not only about economic resilience — it was a gateway to greater agricultural autonomy and participation in decision-making.

Building on this progress, TBG plans to support the transformation of VSLAs into formal financial cooperatives, offering larger loans, insurance and investment services. This next step aims to enhance women's ability to scale up climate-smart cocoa production, boost income and reinforce their role in building climate-resilient landscapes.

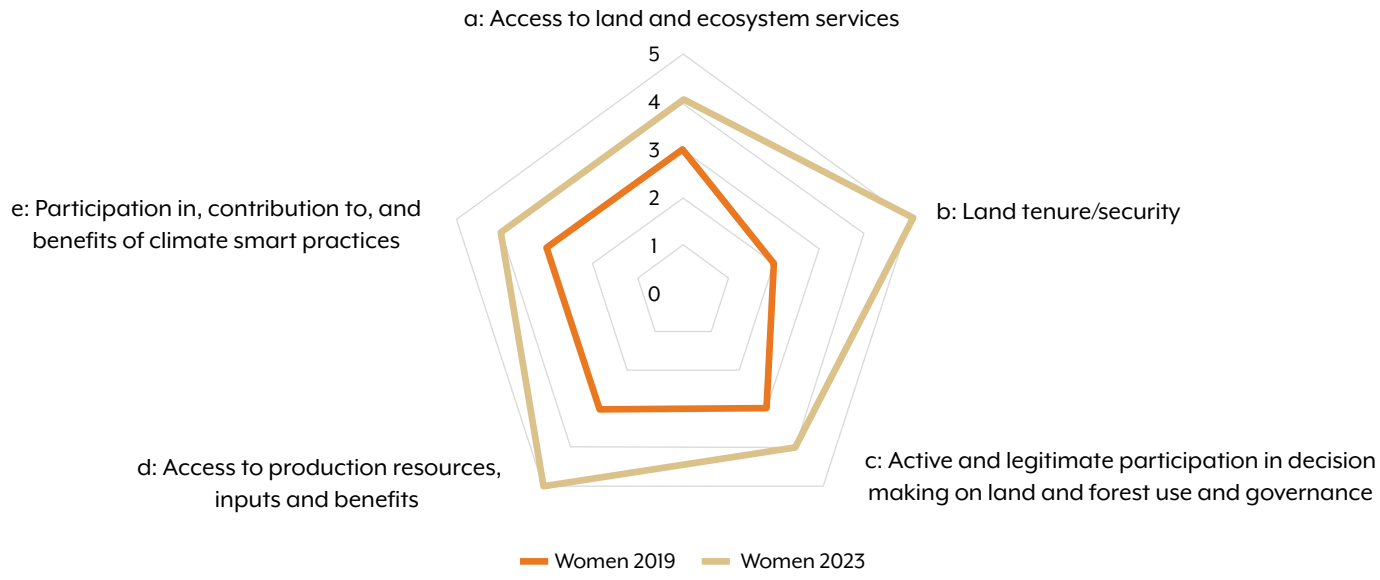

Figure 3. Indicators of gender transformative change among women in Juaboso-Bia (JB) and Sefwi Wiawso (SW) landscapes, Ghana, 2019 and 2023. Note: Numbers of 0 to 5 are scores of the five indicators (a–e).

Women's participation in climate-smart practices

South Ketapang, Indonesia

In South Ketapang, West Kalimantan, the Matan Hilir Selatan (MHS) sub-district is characterized by carbon-rich peatlands that support high biodiversity and biomass. These peatlands are extremely fire-prone — particularly during periods of drought.

The area is home to Javanese, Sundanese and Malay communities, where land-use decisions are traditionally dominated by men. Cultural and religious norms often restrict women to domestic roles, and land ownership is typically held by men as household heads. As a result, women can access and use land and ecosystem services only with a man's permission, limiting their influence over how land is managed.

Since 2018, Tropenbos Indonesia (TB Indonesia) has worked in four villages to improve women's access to knowledge of and decision-making in climate-resilient agriculture. A series of training programmes — including gender-responsive farmer field schools (FFSs) — introduced women to practical alternatives to slash-and-burn land clearing and to methods for producing organic fertilizer using household waste.

Onua Do VSLA members in Suhenso, Ghana, proudly displaying their annual share of financial contributions. Photo: Elliot Mensah

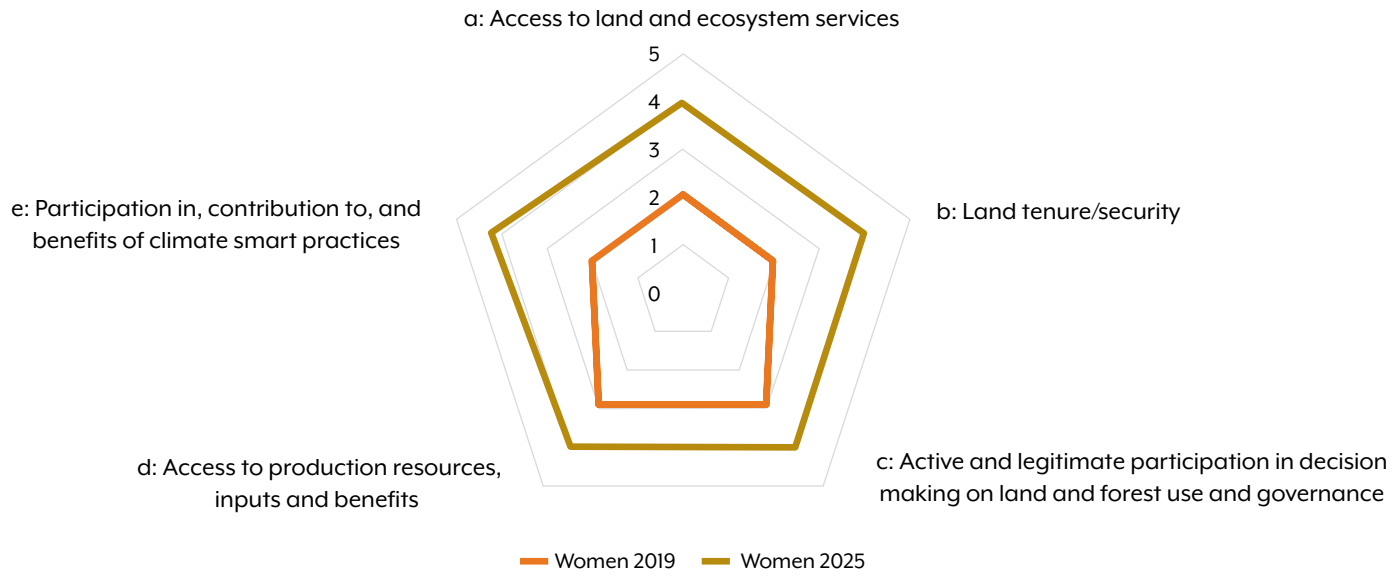

Figure 4. Indicators of gender transformative change among women in Matan Hilir Selatan and Simpang Dua Sub-districts of West Kalimantan, Indonesia, 2019 and 2025

Note: Numbers of 0 to 5 are scores of the five indicators (a–e).

With these new skills, women began to independently establish agroforestry plots. On mineral soils, they cultivated coconut and rubber; on peatland, they grew oil palm and pineapple. These mixed systems help maintain land productivity while reducing fire risk and improving resilience to drought and floods (Widayati, 2024). The diversification also provided women with multiple income sources, supporting household food security and economic independence.

Over five years, women's participation in landscape governance also increased. They began contributing to the management of Village Forest Management Units (LDPH) and Village Forest Business Units (KUPS). Their participation in land-use decision-making (see indicator c in Figure 4) and climate-smart practices (see indicator e in Figure 4) also grew, marking a substantial shift in both confidence and practical engagement.

Previously hesitant to enter a domain dominated by men, women now report increased agency, awareness and capacity to influence decisions. Their presence in fire prevention patrols and sustainable farming groups underscores this transformation.

The case of Ketapang shows how ongoing gender-aware training, combined with encouragement and institutional support, can unlock the potential of women as active land stewards — benefiting families and climate resilience.

Lessons learned

Across these four landscapes, meaningful progress was made in women's participation, particularly in governance, finance and land-use practice. These shifts were not the result of interventions alone. Women in these regions were already mobilizing, organizing, and advocating for greater influence in forest and land management. What the interventions did was seize on this momentum — responding to the energy and appetite for change that already existed among women.

In governance, women in Bolivia formed the all-women OMIML group and were granted formal access to manage a forest area. This gave them not only authority, but also legitimacy — echoing findings that all-women forest committees, especially under experienced leadership, often lead to greater influence and stronger internal advocacy (Agarwal, 2009). In Colombia, Indigenous and peasant women took on public roles in territorial governance — as village heads, treasurers and secretaries of environmental affairs — pushing for biodiversity-focused restoration and the protection of food and water systems. These shifts align with studies showing that when women gain influence in governance, they bring different agendas than men do, often centred on long-term resilience, cooperation and compliance with shared rules (Agarwal, 2009).

Siti, a farmer from Sungai Bakau Village, fertilizes crops on peatlands after receiving training at an FFS. Photo: Irpan Lamago

In financial inclusion, VSLAs in Ghana helped women gain financial independence, diversify income through non-timber forest products, and invest in sustainable farming inputs. This shift not only improved agricultural practices but also began to shift household dynamics, as men observed and, in some cases, supported women's rising decision-making power. Similar observations from other contexts confirm that access to finance and financial literacy are key drivers of women's autonomy and intra-household negotiation power (Simelton et al., 2021; Amponsah et al., 2023).

In Indonesia, tailored training provided women with practical tools and confidence. The participatory and gender-focused curriculum opened up conversations around gender roles and decision-making. Women began to abandon slash-and-burn techniques in favour of fire-resilient practices. These results mirror research showing that experiential learning with embedded gender reflection leads to both behavioural and environmental transformation (Jarial et al., 2024).

Does fostering social equity contribute to improved environmental management and climate resilience?

The case studies suggest that it can — and often does — when inclusion is meaningful and grounded in local realities. Women in Colombia have consistently advocated for food security and ecological restoration, leading to more biodiverse reforestation and broadening the conversation to include nutrition, health and cultural practices. In Indonesia, women who had previously followed their husbands' slash-and-burn methods began implementing non-burn land clearing techniques after gaining access to training and decision-making. This directly contributed to fire prevention and healthier ecosystems. The VSLAs in Ghana allowed women to invest in tools and diversify farming. With more financial freedom, they were able to adopt climate-smart agricultural practices, leading to improved resilience and income generation.

These examples underline how inclusion through women's groups, training and finance mechanisms can unlock access to knowledge, resources and networks, enabling sustainable land practices while empowering women (Begum, 2024). Successful efforts also engaged both men and women leaders, helping shift local mindsets

and creating a more supportive context for women's environmental leadership.

Conclusion and recommendations

Practical, gender-responsive strategies can make a powerful difference, by addressing longstanding inequalities, and by unlocking women's ability to lead, innovate and influence how land is used.

Approaches worked best when layered with and supported by broader community engagement, including with men leaders and elders. These programmes also took the time to understand local dynamics and barriers.

Common trends in inclusion and empowerment strategies emerged across the diverse landscapes.

Ultimately, the most impactful strategies weren't just about "including women" but supporting their agency, confidence and leadership. These cases show how gender-responsive, locally grounded interventions can deliver both social equity and environmental sustainability.

This points to an important takeaway for practitioners: transformative gender strategies are possible, adaptable and urgently needed. Failing to support women's participation is not just an equity issue — it is a missed opportunity for stronger, more resilient landscapes.

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Training in ecological charcoal production in Mount Bamboutus, West Region of Cameroon. Photo: CIFOR-ICRAF

2.2

Gender consideration in land restoration initiatives, Cameroon

A case study in three agroecological zones

Eponle Usoh Sylvie, Joyce B. Endeley, Ann Degrande, Divine Foundjem-Tita, Ademonla A. Djalalou-Dine Arinloye and Alain René Atangana

Empowering women in land restoration is not just a goal; it's a necessity for sustainable ecosystems and equitable futures.

Introduction

Cameroon, sometimes called "Africa in miniature" due to its ecological diversity, is home to a wide range of landscapes, including arid savannahs, fertile highlands, dense tropical forests and coastal ecosystems. These landscapes are crucial in supporting livelihoods and national economic development. However, increasing pressures from deforestation, population pressure and expansion of agricultural activities have severely affected the productivity and resilience of these ecosystems (Molua, 2002). Women are at the forefront of managing and utilizing the landscape, particularly for agriculture, which accounts for over 70% of rural livelihoods in Cameroon (FAO, 2019). Despite being central to agriculture production, however, women are often excluded from decision-making processes and land

restoration initiatives, limiting their capacity to implement effective conservation strategies (Noudem et al. 2025).

The UN Decade on Ecosystem Restoration (2021–2030) has brought global attention to the critical need for restoring degraded ecosystems in order to combat climate change, enhance biodiversity and improve livelihoods (UNEP, 2021). Despite women's substantial contributions to natural resource management and agricultural labour, they face systemic barriers such as limited access to land rights, financial resources and decision-making platforms. These inequities hinder their participation in restoration initiatives, thereby reducing the effectiveness and sustainability of such efforts (FAO, 2019). Studies show that women account for nearly half of the world's smallholder farmers and produce 70% of Africa's food (Odiwuor, 2022; Abass, 2018). Yet less than 20% of land in the world is owned by women (Abass, 2018).

According to James et al. (2021), women play essential roles in land restoration due to their deep connection to natural resource management and their significant contributions to agricultural and community livelihoods. This should make them key stakeholders in efforts to restore degraded lands and ensure sustainable agricultural practices.

Cameroon has committed to restoring 12 million hectares of deforested and degraded land by 2030 as part of the Bonn Challenge and the African Forest Landscape Restoration Initiative (IUCN, 2018). This ambitious pledge is the largest in the Congo Basin, home to the world's second-largest tropical rainforest. It aims to combat land degradation, enhance biodiversity and mitigate climate change. Additionally, Cameroon has set a target to reduce its greenhouse gas emissions by 32% by 2035, aligning with its Nationally Determined Contributions under the Paris Agreement.

While most studies highlight the importance of gender in land restoration initiatives, the concept is often overlooked or addressed only superficially (UNDRR, 2017). Greater attention is needed to examine how gender perspectives can be meaningfully integrated into project activities (see Figure 1). This includes enhancing decision-making and participation, improving outcomes and sustainability, and promoting equity and social justice.

The study presented in this article aimed to assess the development of gender-sensitive restoration options and encourage researchers and practitioners to pay greater attention to effectively integrating gender into land restoration projects. It investigated how selected land

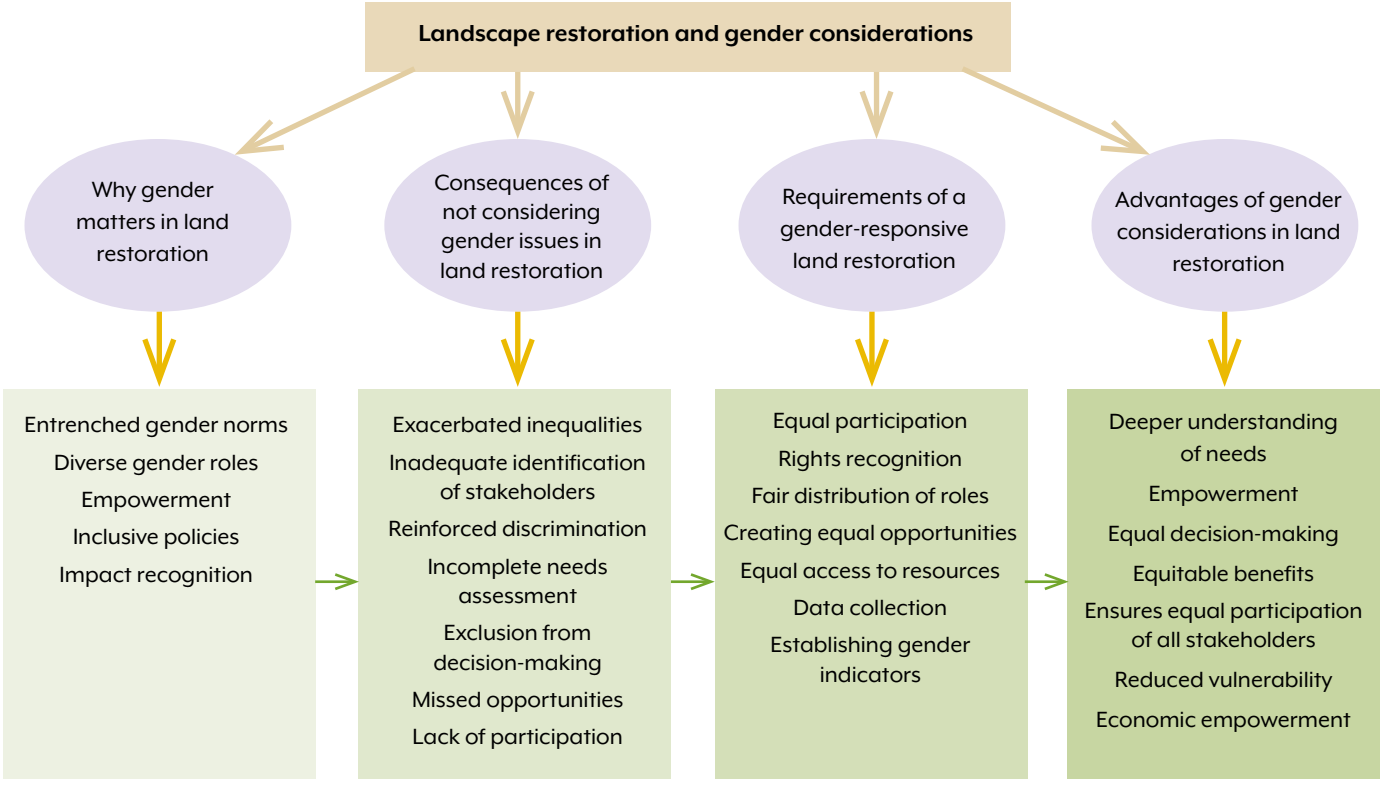

Figure 1. Conceptual framework for incorporating gender in landscape restoration
Source: Authors' fieldwork

restoration initiatives consider gender as a specific focus of analysis throughout the project cycle in the Bimodal Humid Forest, the Western Highland and the Sudano-Sahelian zones of Cameroon.

Methodology

The study focused on three of Cameroon's five agroecological zones (see Figure 2). These zones, in three different regions, were selected to capture the diversity of socio-cultural factors that influence women's participation in land restoration initiatives. Each zone has specific environmental and sociocultural dynamics that shape restoration practices.

- The Bimodal Humid Forest Zone is characterized by dense tropical forests, high rainfall and significant biodiversity. However, deforestation and unsustainable farming practices have led to severe land degradation.
- The Western Highland Zone is marked by high altitudes, fertile volcanic soils and intensive agriculture, including the cultivation of staple crops. However, population pressure and overexploitation of land have resulted in soil erosion and fertility loss.
- The Sudano-Sahelian Zone is semi-arid and faces harsh climatic conditions, including prolonged dry seasons and desertification (Kimengsi and Andin, 2018).

A total of 262 participants (women and men) from 17 communities engaged in the study, which focused on land restoration projects. The PAMSUB-PT (2014–2016) and DRYAD (2017–2019) projects were funded by IFAD and DFID-UK and implemented by the *Centre d'Appui aux Femmes et aux Ruraux* (CAFER). The PADESAR3C (2018–2022) and PAPRED (2020–2022) projects received funding from the Government of Quebec through its International Climate Cooperation Program and from the Government of Cameroon, through the Ministry of Economy, Planning and Regional Development, and implemented by *Action pour la Biodiversité et Gestion des Terroirs* (ABIOGeT). The COBALAM project (2020–2025) is funded by GEF and implemented by the Rainforest Alliance (RA) and Cameroon's Ministry of Environment. These projects align with national strategies for forest landscape restoration, emphasizing land restoration, tree management, sustainable agriculture, resilience to environmental degradation, and inclusivity.

Ten focus group discussions (FGDs) were conducted with men (86 participants); 12 were conducted with women (124 participants); and four were conducted with mixed groups (12 men and 40 women), centring on gender integration in project planning, women's participation in decision-making, and the impacts of restoration activities (see Table 1). Key informant interviews (KIIs) were held with seven project staff, discussing gender as a core variable in the identification of options and implementation. Data was collected by three senior scientists and a PhD fellow.

Perspectives on gender integration in land restoration projects

Beneficiaries' perspectives

All the projects assessed by the study combined sustainable agricultural practices with tree planting as a central activity aimed at restoring degraded lands. For example, agroforestry systems were introduced, where trees were integrated into farmlands to improve soil fertility and enhance biodiversity. Women played a significant role in project activities, particularly in managing tree nurseries and planting trees, as well as adopting sustainable farming techniques to increase crop yields. The COBALAM projects introduced ecological charcoal production as an innovative activity to reduce pressure on natural forests.

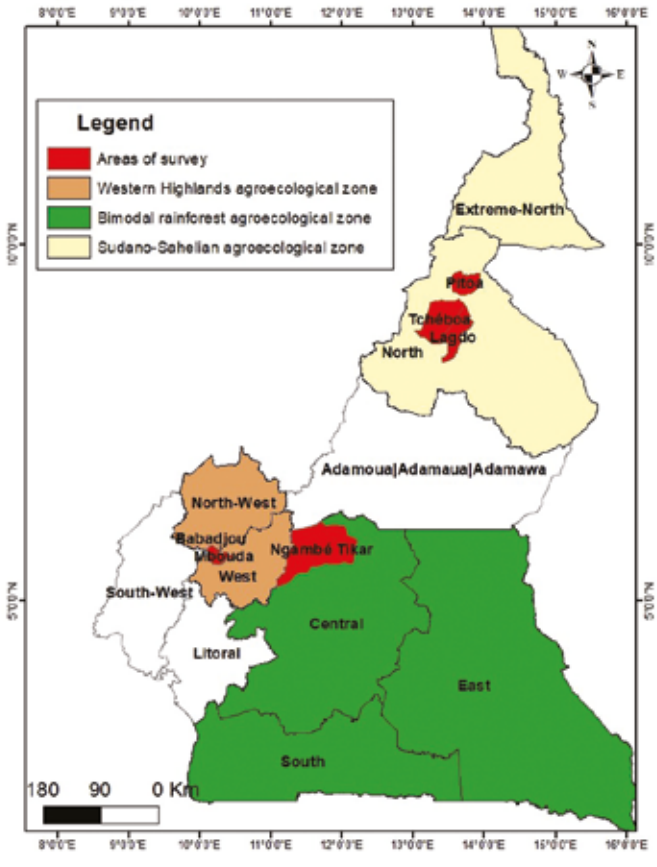

Figure 2. Location of study areas
Source: CIFOR-ICRAF, 2021

Table 1. Number of focus groups in each agroecological zone

Study site	Villages	Average no. of participants/FGD	No. of men FGD	No. of women FGD	Number of mixed FGDs	Total	Projects
Bimodal Humid Forest Zone, Center Region, (Ngambe-Tikar)	Mbondé, Kouen, Mambioko, Ngoumé, Gandié, Nyanka, Beng Beng	9	6	6	0	12	PAMSUB-PT DRYAD
Western Highland Zone, West Region, (Mount Bamboutos)	Badbajou, Bangang, Batcham	10	2	3	1	6	COBALAM
Sudano-Sahelian Zone, North Region (Ngong and Lagdo)	Bawan, Badankali Rabingha, Forty, Langi and Lagdo	8	2	3	3	8	PADESAR3C PAPRED
Total		**9**	**10**	**12**	**4**	**26**	

The authors' analysis indicates that the targeted beneficiaries of the project activities perceived a significant lack of gender integration in the design and implementation of the projects. A greater proportion of women beneficiaries reported feeling excluded from the project design process, highlighting a failure to involve women during the needs assessment. This oversight resulted in the projects' inability to adequately address the specific needs of women, such as access to resources, inclusive capacity building and representation in decision-making. When these aspects are overlooked, projects often fail to address the root causes of gender inequality in land restoration. For example, without women's voices in decision-making processes, projects may not reflect the diverse needs and perspectives of all stakeholders. For example, while the DRYAD project successfully facilitated participation in maize production as part of its activities, it became evident that women beneficiaries expressed a preference for alternative agricultural crops, such as cassava and cocoyam.

Failing to consider this preference underscores a shortcoming in the needs assessment process.

> ***"Cassava and cocoyam are more profitable for us because they require less input, and we can sell them easily in local markets." Another woman commented, "Maize takes too much effort, but with cassava, I can also feed my family."***
>
> A woman participant

The authors' analysis reveals that general meetings organized by project staff, which brought together men and women in shared environments to discuss restoration priorities and potential interventions, failed to account for the diverse interests of different gender groups. Additionally, in the Center Region, 36 women reported a lack of awareness regarding project details, which significantly discouraged their participation, particularly during critical farming periods.

In the Western Highland Zone, beneficiaries noted that they were consulted individually, and that their needs were properly identified and considered gender socio-cultural norms that could influence their participation. They were responsible for deciding the kind of land restoration activities they wanted to execute, and were supported by the project staff members.

In the Sudano Sahelian Zone, the lack of direct communication with women about project goals can be attributed to the project's reliance on traditional leaders; information about projects was often shared through men community leaders. This approach inadvertently marginalized women, as they were not included in these discussions. Consequently, women frequently learned about projects indirectly, either through men family members or informal community networks, which often resulted in their delayed or incomplete understanding of the project's objectives and activities.

Notably, the PAPRED project's primary focus on cashew *(Anacardium occidentale)* appears to disadvantage

Women of the LAKI GAPELE Cooperative in the North Region of Cameroon setting up a nursery. Photo: CIFOR-ICRAF

women, as cashew is often perceived as a "male" species; in other words, one that is planted by men. Discussions with beneficiaries revealed a divergence in species preferences by men and women for the species proposed (cashew). Women expressed a preference for fruit trees such as baobab *(Adansonia digitata)*, shea *(Vitellaria paradoxa)* and mango *(Mangifera indica)*, as well as oleaginous trees and neem *(Azadirachta indica)*. Men favoured species such as teak *(Tectona grandis)*, acacia (*Faidherbia albida)*, tamarind *(Tamarindus indica)*, Siamese cassia *(Cassia siamea)*, leucaena *(Leucaena leucocephala)* and moringa *(Moringa oleifera)*. None of the species preferred by either men or women was advocated by the project management, however. This disparity in species prioritization highlights the need for a more inclusive approach that considers the preferences and interests of both men and women.

Project staff perspectives

In the Humid Forest Zone, project staff recognized that addressing gender disparities and ensuring the equal participation of women and men is crucial to the success and sustainability of land restoration initiatives. Despite this recognition, however, the project staff did not engage men and women separately during needs identification, which limited their ability to address gender-specific concerns. They observed that the data collected did not differentiate between men's and women's experiences, nor did it inform critical project indicators such as decision-making and equal participation.

The Western Highland Zone showcased a more gender-responsive design. Project staff understood the social dynamics that influence women's access to land, and incorporated gender considerations throughout the project cycle. Women's participation increased because

project activities were adapted to their specific challenges, and women gained greater access to training and decision-making, which allowed them to contribute meaningfully to the project's success. The project ensured gender-responsive planning and execution by hiring a gender specialist to guide the integration of gender considerations throughout the project cycle. The project staff ensured women's representation in project governance structures such as the Land Management Board and provided leadership training to women, enabling them to take on active roles and influence project outcomes.

In the Sudano-Sahelian Zone, staff aimed to ensure equal opportunities for participation in project activities. However, they observed that men were disproportionately involved in training sessions and other project-related activities. Despite some awareness of existing gender inequalities — including unequal access to training, exclusion from decision-making, unequal resource ownership, and heavier workloads for women — no corrective actions, such as providing gender-specific training, promoting women's leadership, and adjusting project activities to accommodate women's time constraints and responsibilities, were implemented.

Gendered decision-making dynamics

Analysis reveals that gendered decision-making dynamics across the sites studied influence the processes and outcomes of decision-making between men and women, with an impact on women's participation in land restoration initiatives. In the context of this study, men dominate decision-making, leading to the marginalization of women's voices and perspectives. Table 2 illustrates decision-making dynamics across the different projects, revealing distinct patterns shaped by gender roles, power structures, and sociocultural norms.

Table 2. Gendered decision-making dynamics across projects in three zones of Cameroon

Decision type	Participants	Decision-making dynamics	Observations	Project
Household decision-making	Men and women	Joint decision-making on crops; roles vary	Women participate, but roles differ	PAMSUB-PT DRYAD
Community-level decisions	Women and men	Limited involvement by women; men dominate	Women are often excluded from community decisions	PAMSUB-PT DRYAD
Project activities	Men and women	Men and women oversee activities, allocate resources	Women face systemic barriers to participation	PAMSUB-PT DRYAD
Income allocation	Women	Women have some control of their income, but need their husbands' approval	Women require permission to sell produce, justify needs	PADESAR3C PAPRED
Choice of species	Men and women	Women involved, but have limited say in species selection	Women and men must accept species chosen by the project team	PADESAR3C PAPRED
Market decisions	Men and women	Men usually decide what to buy without consulting wives	Women depend on husbands for purchasing decisions	PADESAR3C PAPRED
Utilization of income from sales	Men and women	Joint decisions on income from seedling sales	Women seek equitable representation in decision-making	PADESAR3C PAPRED DRYAD
Land management boards	Women	Women contribute to sustainable land decisions such as land rights and ownership	Training has empowered women's participation	COBALAM

Source: Authors' field data, 2024

Projects' impacts

Table 3 describes the various interventions carried out in each of the agroecological zones and the results they obtained. The list of activities is not exhaustive, but it gives a general idea of the restoration activities in each of the zones and their social, ecological and economic impacts.

Conclusion and recommendation

This article highlights critical gaps in gender integration in land restoration projects. The authors' analysis shows that different forest land restoration options are implemented in each of the case study sites; they include sustainable forest management, tree crop-based agroforestry systems and use of improved cook stoves. Although women beneficiaries express a strong desire for greater involvement in restoration projects, systemic barriers such as cultural norms and entrenched gender roles continue to limit their engagement. Project staff are aware of the importance of gender issues; however, they have not fully translated this awareness into actionable strategies to address these barriers. For this reason, the land restoration

Table 3. Social, ecological and economic impacts of the projects

Impact type	Restoration activities	Results	Projects
Social	Support the creation of community businesses	20 community businesses created, 60% women	COBALAM
	Raise awareness of women in decision-making	About 1,000 people engaged, 56% women	
	Distribute improved stoves for women's well-being	60 stoves distributed	
	Establish Land Management Committees	5 committees set up in West Region	
Ecological	Develop agroforestry systems for fruit, medicinal, spices and timber species	1,100 fruit trees planted at seven schools in 2010 and 2015	PAMSUB-PT DRYAD
	Reforest farms	12.5 ha reforested, 54 plots, 904 plants 2015–2017	
	Create agroforestry nurseries	2,160 nurseries distributed to 54 agro-foresters	
	Restore community forests	8 community nurseries created in Adamaoua, North and Far North regions	PADESAR3C PAPRED
	Rehabilite degraded land	About 500 ha rehabilitated	
	Improve soil fertility (composting, biofertilizers and ecological charcoal)		COBALAM
	Reforest with agroforestry trees	Creation of 623.5 ha of agroforestry plantations	PADESAR3C PAPRED
Economic	Train smallholders and nursery operators	1,500 smallholders, 60 nursery operators trained in tree planting	
	Distribute improved food and fodder seeds (maize, peanuts, beans, ground peas, *brachiaria*)	3,500 kg of improved seeds distributed	
	Install grinding mills	7 mills installed	PAMSUB-PT DRYAD
	Provide access to land	248 hectares (66 for agroforestry, 182 for agroecology)	

Source: Authors' field data, 2023

projects discussed here achieved only partial success, such as land restoration and resource conservation; they faced constrained social outcomes such as empowerment and equity. Only the land restoration project in the Western Highlands made attempts to address gender transformation activities, including women in land management boards in a bid to influence gender norms, roles and relations between women and men.

Based on this analysis, future projects should prioritize gender analysis as a core component during the design phase. This includes conducting comprehensive needs assessments that capture the preferences and concerns of both men and women. Additionally, projects should establish decision-making frameworks to enhance the agency of women in land management and restoration initiatives.

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Drone view of the Amazon rainforest and the Caeté River, Cazumbá-Iracema Extractive Reserve, Acre, Brazil. Photo: Andre Dib

2.3

Promoting gender in the Brazilian forestry sector

The importance of networks

Andressa Ribeiro, Raquel Álvares Leão, Claudia Moster and Taiana Guimarães Arriel

The Forest Women's Network is driving the development towards gender equity within the forestry sector in Brazil and has achieved progress in breaking down gender barriers and consolidating women's leadership.

Gendered barriers

Gendered barriers stem from historical, cultural and institutional factors that have traditionally excluded women from equal participation. Forestry has long been perceived as a physically demanding field, dominated by men, which reinforces stereotypes that limit women's access to employment, leadership roles and technical training.

Despite progress in the sector, significant challenges persist. To facilitate experience sharing and advance gender equality in Brazilian forestry, the Forest Women's Network (*Rede Mulher Florestal*, or RMF; literally, "Forest Woman Network") was founded in 2018. An independent and pioneering initiative, RMF brings together individuals and organizations from the forestry sector to exchange knowledge, advocate for women's inclusion, and drive positive change. Over the past six years, the network has

experienced a remarkable 356% increase in participation, which now encompasses 30 private-sector enterprises and 192 civil members.

Originally created in the context of planted forest industries, with most companies and planted areas concentrated in the central-southern part of Brazil, RMF has been trying to expand its scope by increasing the participation of more women from the north and northeast of the country, and from native forest management at the large and community scale. Currently, two of eight women on the board of directors' work in the north of the country in native forest management, one of them the winner of the Wangari Maathai Prize in 2017 (RMF, 2023; RMF 2025).

Although women remain a minority in Brazil's forestry sector, their representation has steadily increased across most professional areas over the past five years (RMF, 2024). However, according to the *Gender Panorama* report for 2023, women are still under-represented in the Brazilian forestry sector. This disparity highlights the urgent need for initiatives such as RMF to promote gender equity and foster a more inclusive industry. Women in forestry continue to face discrimination, harassment and systemic obstacles in attaining leadership roles.

To address these challenges, RMF implements initiatives aimed at strengthening inclusive governance and combating discriminatory practices. This article highlights the RMF's work, reflecting on its activities and impacts.

The Forest Women's Network (RMF)

RMF focuses on promoting gender equality and inclusion within the forest sector. It encourages collaboration and knowledge sharing through various initiatives aimed at fostering more equitable work environments. Its objectives include empowering women in the industry and supporting the creation of diverse and respectful workplaces. The organization also provides opportunities for individuals and businesses to participate in and contribute to these objectives, while emphasizing values such as empathy, ethics and leadership.

RMF governance comprises a board of volunteer members who play a range of roles. Elections take place annually.

All network activities take place in working groups (WGs); these are composed of volunteer's members active in the forest sector who support RMF in implementing its strategic planning. Of the total RMF members, 103 are distributed among four WGs. All working groups have one coordinator and one vice coordinator who organize monthly meetings with the group to outline goals and objectives. These are the four working groups:

- Equality and empowerment — create an environment to foster discussion and actions that support gender equality and women's empowerment.
- Education — foster education and training in the forestry sector.
- Women in decision making — identify barriers to the presence of women in decision-making and develop strategies to increase their presence in this area.
- Maternity and women in the job market — identify actions to support pregnant and nursing women in the workplace and diagnose the challenges to and incentives for women in the job market.

The RMF working groups promote gender equality in the Brazilian forestry sector through strategic actions such as holding thematic workshops with members and non-members and using semi-structured questionnaires with women in the forestry sector to better understand gender issues.

Between 2020 and 2023, RMF conducted various initiatives, primarily involving large companies in the forestry sector who engage with local communities. Notable practices adopted by companies affiliated with RMF include: a) tailored training programmes for women in forestry, harvesting and field operations;

Logo of the *Rede Mulher Florestal.*

View of forest cover of Barro Alto, Goiás, Brazil. Photo: Geliane Rocha

b) policies that support women professionals, such as designated breastfeeding spaces, flexible working hours, and extended maternity and paternity leave; c) inclusive recruitment practices, including the creation of women-only job positions and gender-sensitive human resource management; and d) initiatives that encourage participation in gender-related events, research and publications.

Success stories such as the Dona Della Project and the Impact Business Promotion Program by Bracell, the Female Leadership Programme, Mechanical Forestry Machine Operator Training, Hiring and Inclusion of Women, and the Construction of a Shellfish Processing Unit in Belmonte (BA) by Veracel, as well as the promotion of heavy-vehicle qualifications for women by Sylvamo, are tangible examples of the RMF's direct impact on women's empowerment within the sector. Below are further details on specific actions within RMF.

"It was essential for contributing to decisions in my professional career, in addition to having gained a friendship for life, the match was super positive and assertive."

Pamela Bahia, Mentee in the 2024 Forests for all Women programme

Mentoring programme: Forests for all Women

One of RMF's flagship initiatives is the Forests for all Women mentoring programme, launched by the Equality and Empowerment working group in 2022. The initiative was designed to foster women's personal and professional development within the forestry sector. The programme, for women affiliated with RMF, facilitates monthly exchanges and sessions between mentors and mentees. Through mentoring, participants gained access to valuable networks, knowledge-sharing opportunities and leadership training. These connections are crucial for women to build confidence, overcome workplace challenges, and advance in their careers.

The latest iteration of the programme, held in 2024, saw a notable increase in participation, with 29 mentors (up from 22 in 2023) and 31 mentees (compared to 22 in 2023).

The initiative also emphasizes the importance of creating support networks among women in forestry. These networks foster solidarity and provide a platform for women to share their experiences and strategies for success. Participants have reported increased confidence in addressing workplace challenges, have successfully advocated for more inclusive policies in their organizations, and have even progressed to leadership positions within their companies.

Additionally, these networks have facilitated collaborations on sustainability projects, demonstrating the power of collective action in achieving both professional and environmental goals. The programme also includes workshops on critical issues such as harassment prevention, pay equity and the contribution of women to environmental sustainability. By addressing these topics, RMF empowers women to become advocates for change within their organizations and communities.

Gender Panorama report

RMF's efforts to promote gender equality are informed by data and research collected through an extensive questionnaire. This led to the publication of the *Gender Panorama* report. The first edition, published in 2019, had 21 responding organizations; it represented a significant milestone in and starting point for promoting actions in favour of equality between men and women. In the second edition, published in 2021, 41 organizations responded; and the third edition, published in 2024, had 32 responding organizations (RMF, 2024). It is important to emphasize that these 32 organizations directly or indirectly influence the lives of more than 150,000 people, with a significant and multiplying impact.

The latest report, from 2023, highlights the state of women's representation in the forestry sector: women occupy only 18% of positions across the forest sector, with significant underrepresentation at almost all hierarchical levels. Notable exceptions include sustainability boards (50%) and human resources (56%), where women have achieved greater parity. However, at the highest decision-making level, such as forestry directorates, women's representation remains alarmingly low at just 7% (RMF, 2024).

Despite these challenges, there are signs of progress. The report notes an increase in policies promoting diversity within the forestry companies that replied to the questionnaire, rising from 62% in 2020 to 87% in 2023. Similarly, the adoption of policies that specifically address gender equity has grown from 46% to 72% (RMF, 2024).

Women in forest governance

RMF actively promotes women's participation in governance by providing data and insights on their roles in the forestry sector. The *Gender Panorama* report has played a key role in encouraging more inclusive hiring practices within forestry companies and in shaping corporate policies to close gender gaps. Progress in companies' adopting policies or statements

"I met an admirable mentor during the meetings. We were able to exchange experiences and define achievable goals for my professional development."

Gabriela Maia, Mentee in the 2024
Forests for All Women programme

on gender equality and non-discrimination marks a significant improvement. This shift reflects a growing acknowledgment of the need for formal guidelines that reinforce equal opportunities and for the elimination of workplace discrimination (RMF, 2024).

Inclusive workplaces

Creating inclusive workplaces is a cornerstone of RMF's mission. Beyond advocating formal policies on issues that affect women, RMF encourages informal practices that drive cultural shifts within workplaces. These include fostering mentorship opportunities, promoting dialogue on unconscious biases, and celebrating women's achievements to normalize their presence in leadership roles, as well as posts on social media to promote more inclusive workplaces.

By addressing both formal structures and informal dynamics, RMF aims to create a workplace culture that genuinely values diversity and inclusivity. The organization works closely with forestry companies to implement

Instagram post by RMF promoting the registration of women forest engineers in Brazilian class councils. Source: RMF

policies that promote gender equality and workplace safety. These policies address issues such as equal pay, maternity leave and harassment prevention, ensuring that women can work in environments free from discrimination and fear. Examples of practices that have been adopted by companies associated with the network are spaces for breastfeeding, adjustments in working hours and extension of maternity or paternity leave (RMF, 2024).

Education and advocacy

Education and advocacy are central to RMF's efforts. The organization conducts awareness campaigns to challenge stereotypes and highlight the contributions of women in forestry. These campaigns aim to shift public perceptions and inspire more women to pursue careers in the forest sector; they include informative posts on social media.

Workshops and training sessions are another key component of RMF's strategy, aimed primarily at women in the forestry sector, both professionals and students. These events provide women with the skills and knowledge they need to excel, while also helping them to address challenges such as gender bias and workplace harassment. By empowering women through education, RMF helps create a new generation of leaders; it also considers men to be allies in gender equality, who can help drive progress in the forestry sector.

Sustainability through gender diversity

Gender diversity is not only a matter of fairness, but also a critical factor in achieving sustainability. For example, in community-based forestry initiatives, the inclusion of women has led to improved resource allocation and enhanced biodiversity outcomes by incorporating diverse knowledge systems and perspectives. Specific case studies, such as women-led reforestation projects in Pará, have demonstrated higher seedling survival rates and ecosystem recovery compared to initiatives dominated by men (Cavalcante and de Souza, 2023). This

Tocantins River, Municipality of Imperatriz, Brazil. Photo: Clarice Sousa

highlights how gender-inclusive practices can contribute directly to environmental resilience and sustainable forest management.

Women's specific perspectives and experiences contribute to more balanced and effective decision-making processes, particularly in areas such as resource management and environmental conservation (IUCN, 2024). By promoting gender equity, RMF enhances the forestry sector's ability to address complex challenges and adapt to changing conditions.

Looking ahead

The journey to gender equality in forestry is far from over, but RMF's work provides a model for how change can be achieved. As the network continues to grow, its impact on the Brazilian forestry sector is becoming increasingly evident. Through its programmes and advocacy efforts, RMF is helping to create a more inclusive and sustainable industry that values the contributions of all its members.

RMF's initiatives align with broader global efforts to promote sustainable development. The organization's work supports several United Nations Sustainable Development Goals (SDGs), including gender equality (SDG 5), decent work and economic growth (SDG 8), and climate action (SDG 13). By integrating these goals into its programmes, RMF demonstrates the interconnectedness of social, economic and environmental sustainability (UN, 2015).

In the years to come, the success of RMF will depend on continued collaboration and commitment from all stakeholders in the forestry sector. By working together, these stakeholders can build a future where women's leadership and gender diversity are integral to the industry's success and sustainability.

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2.4

Maman Marie, with her beekeeping equipment. Photo: ASD

The marginalization of Bantu women in forest management, Cameroon

Geneviève Ndjiki Wéladji

"I planted these trees so later on the harvests help me send my numerous kids to school. Because of the [uncontrolled] exploitation of our community forest, NTFPs are becoming increasingly rare."

Frankline Koussek, resident of Abonis

Introduction

On a socio-economic level, women and children lose more time and become more exhausted collecting fewer NTFPs than they did 20 years ago because of the longer distances they now need to cover on foot. Furthermore, logging for timber favours cutting the trees that produce NTFPs, which leads to the reduction of products that support the income of women and their families. This situation affects the empowerment of women and thus increases the precariousness of households in forest areas. Kassa and Yigezu (2015) reveal that income inequality is mitigated when NTFPs are integrated into the local economy.

This article discusses the impacts of the marginalization of Bantu women in Abonis, Cameroon, when it comes to forest management. It is based on field experiences carried out during the implementation of the project, Women's Empowerment for Sustainable Forest Management in the East

Region of Cameroon, which aimed to empower women through sustainable forest management practices. The article highlights the challenges linked to women's involvement in the management of natural resources, and on the environmental and socio-economic impacts of taking women into account. Some effective solutions, such as those implemented by Action for Sustainable Development (ASD) that are discussed here, could inspire other stakeholders.

Context

Angossas is an arrondissement in East Region of Cameroon, with one of the largest forest areas in the country. In 2017, the population of Angossas was estimated at 19,888 inhabitants, 10,426 of whom were women (Republic of Cameroon, 2018). The ASD project was implemented in Abonis, located in this arrondissement.

Abonis is a small village of less than a thousand people. It is near a forest rich in woody species and non-timber forest products (NTFPs). The main activity carried out by women and young people is subsistence farming associated with the collection and sale of NTFPs. The most frequently sold NTFPs are Wild mango (*Irvingia gabonensis*), djansang (*Ricinodendron heudelotii*), moabi (*Baillonella toxisperma*), rattan, hazelnuts (*Coula edulis*), voacanga (*Voacanga africana*), Bitter kola (*Garcinia cola*), mbalaka (*Pentaclethra macrophylla*), rondelle (*Afrostyrax lepidophyllus*), and calabash nutmeg or Gabonese nutmeg (*Monodora myristica*).

In forested areas, the forest is the pantry and the market of the communities. It is from the forest that people get their protein (insects, game, caterpillars, etc.); the streams that flow in the forest provide freshwater fish; the lipids come from palm oil, moabi oil, etc. The forest is also the pharmacy of the communities; it provides people with natural medicine for free. Butler (2009) calls the rainforest "the ultimate chemical laboratory," because each rainforest species uses a variety of chemical defences to ensure its survival in the harsh world of natural selection. Rainforest plants offer tangible potential through remedies for various medical problems, ranging from toothache to childhood leukaemia. Many plants identified as having anti-cancer properties or used in the manufacture of medications are found in the rainforest.

All this wealth would be lost if nothing is done to address the loss of forest cover due to timber exploitation. The conversion of forests into agricultural land to meet the food and energy needs of local people is the main cause of deforestation in the country. According to Médiaterre, Terre et forêt (2023), Cameroon lost 708,000 hectares of

Processing the seeds of djansang *(Ricinidendron heudelotii)*. Photo: ASD

primary tropical forests, or 48% of its total forest cover, between 2002 and 2020.

The uncontrolled management of forest landscapes in Cameroon, and more particularly in Abonis, has many disadvantages at both the environmental and socio-economic level. At the environmental level, a loss of forest coverage has led to an increase in greenhouse gases such as CO_2 and to the instability of the weather (climate change). This leads to a decline in agricultural production. The excessive drought increases the risk of wildfires that destroy agricultural plots. Conversely, excessive rainfall also has a negative impact on production because of the floods that destroy homes and even communities.

The involvement of women in sustainable forest management is a necessity in order to improve the situation effectively. There are enormous benefits to involving both men and women in forest management (Agarwal, 2009). The participation of women in forest decision-making at the community level has been shown to have positive effects on a range of forest management issues, including the regulation of illegal activities and the ability of communities to manage conflicts (Coleman and Mwangi, 2013).

The daily life of Abonis women

Women and girls are the working linchpin of households. They are responsible for supplying the family with water, food, fuelwood, etc. Due to the lack of drinking water sources near homes, women and girls must often travel between two and three kilometres (km) to do laundry and get drinking water for the house. In addition, the precariousness in forest areas villages leads to young girls being sent into marriage very young by their parents.

According to the World Bank et al. (2009), women in forest communities derive half of their income from forests, compared to one-third for men. In Abonis, income-generating activities are not diversified, which keeps households in poverty and precarity. This makes it difficult for women from the village to meet basic needs such as nutrition, health and education for children. The activities that are carried out daily here are legal and illegal logging, as well as the collection and sale of NTFPs and meat from hunting.

The main source of income for women is the sale of food products such as cassava, plantain, peanuts, macabo (cocoyam) and pistachio. They also collect and sell seasonal NTFPs, but at extremely low prices. Nearly 70% of the NTFPs harvested by women are intended for commercialization, with a portion held back for self-consumption. The money that women earn from sales allows them to buy basic necessities such as matches, salt, oil and soap. Women told the project investigators that for the most active households, women's annual income related to selling NTFPs is around XAF 200,000 (EUR 305) per year.

Challenges to women's involvement in forest management

As in the entire arrondissement, the women of Abonis are not often involved in the management of the community forest; this remains the preserve of men. A scarcity of NTFPs and even of game and fish is apparent due to the

Abonis community during a visit from ASD. Photo: ASD

unsustainable exploitation of the forest and the increase in the local population, which requires more to feed itself.

Environmental income (including from forestry) represents on average 21.5% of the total household income in rural forest areas; the share earned by men is higher than that of women, insofar as men's activities are paid while those of women are subsistence practices (Angelsen et al., 2014). Logging timber from the community forest is one of the most important sources of income, but is controlled mainly by men. Women do not have a say, since it is a highly lucrative activity (more than EUR 7,600 per household, per year, based on the author's research). Among the Bantu, when it comes to things that pay "real money," as they usually say, the woman's place is in the kitchen; she does not have the right to intervene, especially in public. Observations allowed the project investigators to understand that women have no right to speak when it comes to discussing "big things." Most of the time women can be informed only by eavesdropping. The decisions made by men about logging are not discussed with their wives. The worst consequence of this is that men cut down trees that are useful to women and that allow them to manage the daily life of their households. Women are often forced to go farther to look for NTFPs where forest logging has not started yet. These areas are often located dozens of kilometres from the village.

And yet the involvement of everyone in the sustainable management of landscapes is a local and global necessity in view of the growing demands of the population and of the economies that exert increasing pressure on natural resources. Failure to consult with women during the exploitation of community forests leads to the felling or destruction of trees that produce NTFPs, leading to a decrease in harvested quantities and in the number of trees.

"When we were little, we used to collect the fruits of djansang, mangos, etc., behind the houses, but for more than fifteen years, we have been travelling dozens of kilometres to collect these NTFPs, and the quantities are no longer significant. As a result, our income has decreased."

Mrs. Waosse Marguerite, a resident of Abonis,

Project investigations reveal that most of the time, it is illegal loggers who fell the trees because they operate in a destructive and uncontrolled manner, unlike legal loggers, who operate in a well-defined area that is determined when their operating permit is granted.

Participants after a training session and distribution of beekeeping equipment. Photo: ASD

Moving towards legality and women's involvement in SFM

As part of ASD'S project activities, around twenty men and three women were encouraged and supported to work in the sector that supplies the local market with legal fuelwood. By the end of the process, twelve men and one woman had obtained the regulatory documents required by the Ministry of Forests and Wildlife. The woman has obtained the ministry's authorization to work in the Abonis community forest; this encouraged other Abonis women to participate. Having a woman as a participant in the exploitation of the Abonis community forest has made it possible to involve the women of the village in activities related to timber exploitation and in discussions on forest governance.

During this work with small fuelwood operators ASD became interested in the women of Abonis, who it supported in terms of training in and information about agroforestry. The women of Abonis obtained were able to preserve a few trees that produce NTFPs and obtain compensation in terms of agricultural inputs as well as support to develop their agricultural plots for food crops.

Environmental and socio-economic impact of women's coaching in agroforestry

To help increase this impact on women's and youth's empowerment in the village of Abonis, ASD, with support from the Organisation Internationale de la Francophonie

Geneviève near a safou tree *(Dacryodes edulis)* one year after it was transplanted. Photo: ASD

(OIF), has placed a particular emphasis on training and advising Abonis women, who have benefitted from the project involving them in preserving their natural resources.

Supporting women in agroforestry and restoration of degraded areas

One of the things that women in forest areas lack for their empowerment is training or knowledge of various trades. This is why the project started with training sessions on farming and with information about the importance of the production of local and exotic fruit trees, fast-growing and not. The women also discussed the importance of selecting seeds carefully, working in the nursery and carrying out effective monitoring in the nursery and during the first years after transplanting.

The project strengthened the capacities of more than 50 women and 25 young people in production techniques for fruit trees, honey-producing species and growing NTFP tree seedlings in a nursery. A total of 20 women have been counselled on implementing and monitoring their individual nurseries of 100 to 300 plants each. The choice of species for practical training and the establishment of various nurseries focused on fast-growing species and fruit trees such as djansang (*Ricinodendron heudelotii*) and safou (*Dacryodes edulis*). More than 2,000 tree seedlings were produced by the women and allowed to enrich more than two ha of agroforestry and two ha of degraded lands.

Sustainable beekeeping as a new income-generating activity

Beekeeping is an integral part of agriculture, rural development and national economic development, and it plays a vital role in ecosystem preservation all over the world. Bees carry out almost 85% of pollination, contributing to around 34% of the world's food supply (FAO, 2023).

The ASD project identified beekeeping as a nature-based solution with strong potential socio-economic impacts and as a way to combat deforestation and loss of biodiversity. Thus, it trained around 30 women from Abonis and around ten young people in sustainable beekeeping. These trainees were later supported to implement 20 hives in their farming plots. A few months later, around 50 litres of honey had been produced by the first colonized hives. This first harvest has been a motivating factor for people to get involved. Some of the honey was consumed by the households for the well-being of families and some was sold; the money allowed women to buy food for their families (oil, salt, soap, etc.). After harvesting the honey, the hives were baited again and reinstalled to be recolonized by bees.

Environmental and socio-economic benefits

Agroforestry training and restoration actions have a significant impact on the regeneration of faunal and floral habitat, notably for species useful to the livelihoods of women and their families. These initiatives also help improve soil fertility through adding humus and fixing nitrogen, and reduce erosion through increased tree roots and plant cover. It should also be noted that thanks to the trees planted, the storage of CO_2 in biomass and soils will be higher, thereby helping to mitigate the effects of climate change.

The socio-economic impact of the activities carried out include the production of medicinal plants, fruit trees and NTFPs that can be exploited in a few years, and the diversification of income for women through agroforestry. In terms of food security, cultivation associated with trees improves agricultural yields while promoting microclimates and shade, thereby increasing resilience to climatic hazards.

Training and mentoring in beekeeping result in an additional source of income on top of traditional farming through selling honey, wax and other derivatives. Women can diversify their activities by activities such as transforming honey into cosmetic or food products.

Conclusion

The marginalization of Abonis women in forestry management has serious consequences, not only on their livelihoods, but also on the sustainability of forest ecosystems. The Abonis case demonstrates how gender inequality in decision-making leads to the overexploitation of resources that are vital to women, pushing them further into poverty and increasing their vulnerability. ASD's interventions demonstrate that empowering women through agroforestry, sustainable beekeeping and inclusive forest governance can reverse these trends, thus promoting environmental resilience and socio-economic development.

This ecological transition cannot be dissociated from social justice. By placing women at the heart of restoration and agroforestry strategies, they become key participants in a future that is both sustainable and equitable, where a healthy environment and community prosperity reinforce each other.

Recommendations

Awareness campaigns should question the gender traditional standards that exclude women from decision-making when it comes to natural resources.

Compensation mechanisms (for example, agricultural inputs and alternative income projects) should be implemented whenever logging affects women's access to resources.

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FEATURE ARTICLE

Gendered struggles in forest governance research

The experiences of African women scholars

Camilla Tetley, Shizuku Sunagawa, Amani J. Uisso and Susanne Koch

Introduction

The quotation, right, was the immediate reaction of an African woman who, as part of a scientific study, was asked to talk about her experience of having a family while doing research on forest governance. It sums up the ongoing struggles of women scientists in an academic field that is still largely dominated by men. This is evidenced by recent studies that analyze gender patterns in forest science publications, scientific networks and international conferences; they find that while the proportion of women in these spaces has increased, it rarely exceeds one-third (Andersson et al., 2024; Koch and Matviichuk, 2021; Sunagawa, 2024).

“Oh, my friend, it’s difficult!”

Current research shows that gendered norms and a masculine culture still shape the professional domains of forestry and lead to the persistent marginalization of women, despite gender equality policies and strategies being in place (Macinnis-Ng and Zhao, 2022; Ville et al., 2023). This also applies to the academic realm.

Mountain range at fieldwork location in East Africa. Photo: Camilla Tetley

This article highlights the experiences of African forest scholars who live and work in countries in Sub-Saharan Africa (henceforth referred to as African scholars). It draws on empirical research conducted by an international scientific project on gender- and geography-related inequalities in forest science (Strelnyk, 2024). As part of this project, the authors interviewed 20 African scholars doing forest governance research in local and international contexts. They were selected due to their involvement in African-European collaborations that the authors studied ethnographically, and/or because they had published in forest governance research journals captured by Dimensions, a global research database from Digital Science. The authors also conducted participant observation of collaborative meetings in which the scholars were involved.

> *"I came to realize I really like short, not so much LONG, fieldwork, like more than one week. When Jack said, like, 'Oh, you know, Lea, I think maybe you can just go back home,' and I was like 'Oh, my God, thank you so much.' Because the kids would be calling, crying, 'Mummy, we miss you, mummy, WHY are you away? When are you coming back?"*
>
> Lea

The sample consists of interviews with eight women and 12 men, ranging from PhD researchers to professors affiliated with academic research organizations in Cameroon, Democratic Republic of Congo (DRC), Ghana, Kenya, South Africa, Tanzania, Uganda and Zambia. All participants were informed about the study objectives and its focus on inequality in science. The interviews did not focus on gender issues; they were conceptualized as broader conversations on experiences in forest governance research. The interview guide included open questions on interviewees' academic paths, collaboration and publication activities, as well as on perceptions of what "counts" in the field. However, when interviewees spoke about certain choices and challenges, such as going abroad for a PhD, narratives entailing gender-related aspects emerged, allowing the interviewers to ask follow-up questions. If this did not happen spontaneously, direct questions were asked at the end of the conversation. The interview analysis not only considered substantive content (i.e., what was being said), but also discursive dynamics and positionings (i.e., how things were being said, in reaction to what); see Strelnyk et al., 2024, for a detailed explanation of the methodological approach.

The analysis showed that African women scholars face specific challenges that result from societal expectations and patriarchal norms, and from the academic environments, dominated by men, in which they work (Strelnyk et al., 2024). The women shared how they struggled to reconcile their multiple roles and obligations as wives, mothers and academics with expectations of mobility and scientific productivity. Moreover, they reported facing recurring situations where they needed to prove their legitimacy and expertise as researchers to both colleagues and the forest communities they studied.

The following sections highlight the voices of African women scholars and contrast them with the perspectives of men scholars from the same geographical region. All names used are pseudonyms, and details are limited in order to maintain interviewees' anonymity. The data show the complexity of the struggles that African women experience as academic "stewards of forests," which often remain invisible and take place behind the scenes.

"Thank God the Covid came."

Reconciling care responsibilities with forest research

Samantha is a recently married woman and PhD researcher at a Central African university. During her interview, Samantha shared that she found herself pulled in opposing directions: the expectations of her profession on the one side, and of her husband on the other. When asked about her experience of being part of an international research project, she spoke about the chances it offered her, but also the frequent work travel it demanded. She ended her narration about going back and forth between African and European countries for meetings by stating: "Thank God the Covid came and cancelled all <<laughs>> this."

Timber at a Central African port. Photographer: Camilla Tetley

When the interviewer asked, "You didn't want to go?" Samantha responded, "No, but when I say 'thank God,' [I mean] it would not be good for me, but for my family, especially my husband."

Samantha laughed earnestly as she spoke, softening the seriousness of her experience, which was by no means a trivial matter. She spoke of how, being in a new marriage, her husband was dissatisfied with her work demands as these were affecting the duties expected of her as a woman: to tend to the family and home. During one collaborative project meeting, Samantha seemed removed, sitting silently and looking at her phone while other collaborators around the table discussed project matters. Referring to this moment, she shared in the interview: *"I had an argument with my husband, who was saying, 'I'm really tired of your ups and downs, (...) I became the woman of our family.'"*

During the interview, Samantha noted that in African countries, people's family, work and PhD trajectories often move in parallel, while for scholars in the North, these life events are usually sequential or spread over time. This can significantly affect the productivity and progress of scholars at the same career stage:

Lea, a postdoctoral researcher in Central Africa and a mother, also emphasized the specific gendered expectations placed on women in her social context. At an outdoor picnic table at her university, Lea explained: *"There are men who do not eat the food made by the housemaids; the wife has to cook."*

Lea went on to speak solemnly about a colleague who was called home to East Africa while on research travels in Europe after her child passed away due to illness and poor care. She related this devastating case to the steps she takes to protect her children:

> *"Because of my work, now my children have learned to be independent. When I am with them, I teach them all the means to let them survive. I teach all the tactics; like, if this happens, you have to do this (...). So it's easy for me, like even to know when the housemaid is not good, they know what to do."*
>
> Lea

Lea's remark reflects the great efforts that mothers have to make to participate in academia. While these are to some extent required by all parents, they lead to specific struggles, depending on the socio-cultural contexts they are embedded in. In African countries, women often face the dual challenge of patriarchal norms that assign them extensive care responsibilities, and inadequate structural conditions for childcare. Travel and fieldwork demands thus pose particular challenges for women. In her interview, Lea expressed how thankful she was for the support of her supervisor, Jack, as he recognized how difficult it was for her to leave home over an extended period of time.

While Lea mentioned her supervisor Jack as an exceptional counterexample, she stated that in her professional environments, there is often little awareness of the great efforts she needs to make as an academic mother: *"Men expect you to deliver the same; they don't care; they don't think at all about the issues that maybe you'll be going through."*

Two of the interviewees were African women who, despite having children, did not frame the combination of gendered family commitments with the requirements of science as problematic for their trajectories. Both had partnerships with men who also worked as academics, and both emphasized how they shared responsibilities with their partners to facilitate dual careers. One of these women was Fatima, a professor and mother of three in East Africa who, as became clear during the interview, had the privilege of coming from an affluent family. When asked if doing a PhD in a foreign country had been part of her plan, Fatima answered: *"Fortunately, I knew what I wanted. Because I came from a background where my parents and my relatives had exposure. So it wasn't like I was just gambling. I tried my level best to go for what I needed and what was my interest, which is not the case for most of us. Most of our people here, they just get something out of chance."*

Fatima shared her relatively struggle-free experience climbing the academic ladder. She emphasized the positive influence her family had on her chances. She elaborated.

> *"I don't get a lot of problems as others women scholars are getting, yeah. (...) I'VE got a lot of support, and I think that's the reason why I really was coming up VERY fast in my career development, and I was promoted [at] a very young age as compared to most women in [East African country] because of that support."*
>
> Fatima

Goats running through a field at one of the fieldwork sites in East Africa. Photo: Camilla Tetley

Fatima's narratives reflected that in her case, belonging to the middle or upper class of society was a positive factor that compensated for gender, as she received support that eased her academic career progression while establishing a family. Fatima could thus circumvent the common struggles faced by many African women scholars. She was aware of this, however, and repeatedly emphasized her privilege in contrast to other women in her context.

"You just need to know how to play it out."

Men's perspectives on balancing family and academic work

While women often described their challenges in emotional ways during interviews, men emphasized how they managed to cope with their familial responsibilities, not framing them as struggles. For example, when speaking of academic travels, Benjamin, a Professor from Central Africa working in North America, explained: *"I can stay for one week, two weeks, working for the project, of course, even one month. My wife is used to [it], she's accustomed [to] my moving; she knows that I'm a researcher. I'm like a soldier. I can go, and then I will come back. It's okay."*

The background condition that enables Benjamin's travel; i.e., his wife caring for the home and their children, remained unstated in his interview. Similar to Benjamin, most other men interviewed did not articulate struggles related to being a parent. They rather stated how they combined certain care activities, which they had the privilege to select, with academic work, such as Frederick: *"I think it's a challenge, but you just need to know how to play it out. Like, for example, to get here this morning, there's a sports day at my son's school, so I had to go there and cheer him for his race and then left, because I will need to attend a board of examiners meeting. So you just need to do a balance. And I make it a priority that whenever I'm in town, I'm the one who'll pick [up] my children from school."*

Frederick speaks of "playing it out," as though being a parent and researcher were easily manageable tasks. The invisible care work of everyday life, such as driving his son to and from school, making his dinner and so on, again remained unmentioned.

> *"In the North, you will see that most of the PhD students are 20, 30 [years old]. There are some that are less than 25 years. So you see, they don't — the only responsibility they have in their life is themselves. Why it's not the case in Africa? Because you have to dedicate time to our family, especially if you're a woman — yes, do your research if you want, but as a woman, you have to fulfil your responsibilities at home."*
>
> Samantha

"They listen to you as if you're a child."

Navigating forest research environments dominated by men

In addition to challenges resulting from gendered care obligations, various women shared experiences of being marginalized in fieldwork and academic work; they often struggled to put these into words. Jacqueline, for instance, stated:

Sophia, a young scholar from East Africa, similarly described the context: *"To be female means that, first of all, your qualifications (...) don't hold as much weight, you know? You have to speak louder, or speak a LOT more often, just to say the same. (...) If, say, I had a thought and passed it over to a man, and a man said it, they would be heard a LOT easier than me. And another thing is that in the African context especially, it's VERY sexist. It's very — being in a male-dominated workplace [is] not easy to navigate at all. But away from the sexism, even being heard, especially when you're in a room with OLDER African men (...) — even if they DO listen to you, they DO listen to you as if you're a child."*

Women saw the latent devaluation of their expertise and need to justify their presence not only in scientific discussions, but also in fieldwork. Elma, a PhD researcher in East Africa who studied forest land-use practices of Maasai communities in her country, expressed her experience as follows:

"When you go for data collection (...), you mostly encounter MEN, because women don't frequently show up because of their cultural values. And you know, it's like, 'okay, so you're — YOU'RE a woman.' <<laughs>> Like 'what are you doing here? (...) You should be attending your kids and your husband.'"

"Gender balance for me is not a problem."

Men's perspectives on gender equality

While women shared experiences of marginalization that they faced in forest research, the men interviewed often noted that gender inequality had much improved. For instance, Adis, a professor from East Africa, stated: *"Positive discrimination in the research funding helped them [women] a lot. (...) Maybe in future we will have docile men, because all opportunities are now taken [by] female[s], and the male[s], they are not considered."*

That statement was made somewhat jokingly, but contains a position that has also been noted in other interviews with men scholars, which is that gender is not much of a barrier in the field. This is reflected in the following statement by Sebastian: *Gender balance for me is not a problem. Why? Ifsomeone is efficient, they have to be around thetable (...). If someone can be relevant and can beefficient, can deliver; for me, this is the basic."*

Sebastian's statement points to a position echoed by other men who were interviewed; namely, that they of course accept women scholars as colleagues at the same level and, in fact, do not consider gender as a dimension of difference in the academic realm. However, their perspective contrasts starkly with the experiences of women that are outlined above. Given that men are not themselves affected by these experiences, the complexity of women's struggles, and the great efforts they need to make to participate in forest governance research, remain under-addressed in academic contexts.

Timber at a Central African port.
Photographer: Camilla Tetley

Conclusion

These stories illustrate that women who engage with forests as researchers still face significant barriers to equal participation. They experience gendered struggles due to the expectations and demands placed on them as wives, mothers and scientists. Often, the great efforts they need to make to meet these multiple demands take place behind the scenes and are unacknowledged. The aim of this article is to make visible the struggles and efforts of women in forest science. Gender policies in research institutions have supported their participation as academic stewards of forests, and resulted in a growing number of

> *"I think there are more women involved in forestry research than there used to be. But sometimes, you'd feel you were around the table with all men, and sometimes it was a bit hard to get a word in. And sometimes, people, you know, not even thinking you really WANT a chance to contribute or to speak."*
>
> Jacqueline

women in the field. However, as their narrated experiences point out, they still encounter significant difficulties resulting from gendered societal and scientific norms. Increasing awareness of these barriers and struggles is paramount, alongside structural measures to achieve gender balance in the field. A step that could be taken by individual and institutional actors in the field is to renegotiate scientific norms, expectations and measures of success. With their current focus on output and efficiency, and their demands for mobility, prevailing scientific valuation practices inevitably limit the chances of women with extensive care responsibilities resulting from patriarchal norms. Based on the insights from this study, the authors call for future research to further explore the interrelated impacts of socio-cultural conditions and scientific norms on the participation of women in forestry, including academic forest research.

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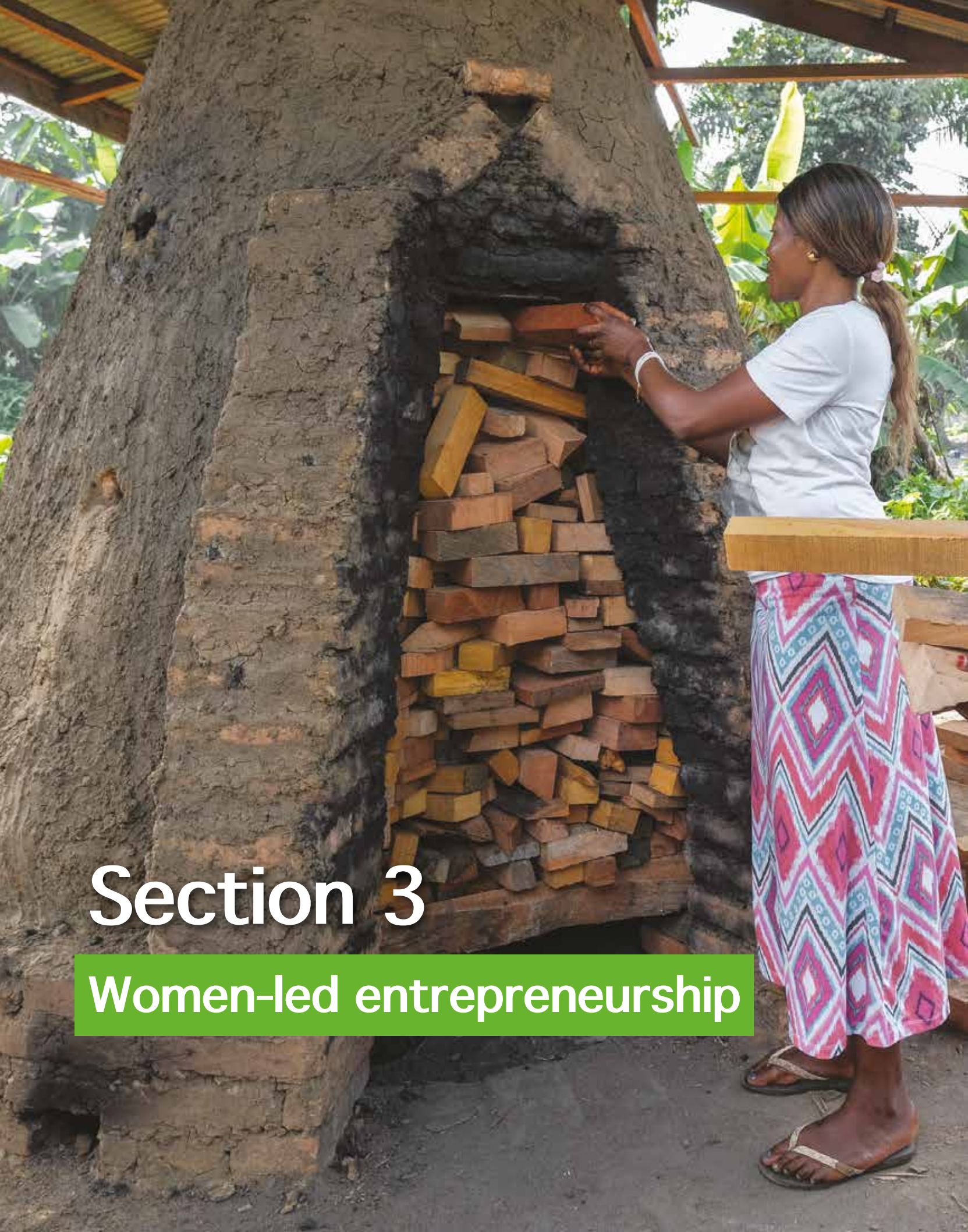

Section 3

Women-led entrepreneurship

Previous page: Loading wood into an improved brick kiln, Republic of Congo. Photo: CIFOR-ICRAF/Axel Fassio

Sourcing of wood at CFT and transport to the carbonization location. Photo: CIFOR-ICRAF/Axel Fassio

3.1

A women's association in Kisangani, Democratic Republic of Congo

Transforming wood residues into sustainable charcoal for the market

Jolien Schure, Georges Mumbere Kiwanza and Protais Limba

Training, organization of the women and registration of their association AFEVADES in 2020 brought significant improvements in efficiency.

Transforming wood residues into sustainable charcoal

In Kisangani, Democratic Republic of Congo, over 80% of households rely on charcoal for cooking due to a lack of affordable energy alternatives; this represents an annual woodfuel demand of more than two million cubic metres (Imani and Moore-Delate, 2021). Charcoal production poses a threat to the nearby Yangambi landscape, one of the areas that supplies Kisangani with woodfuel. This region, encompassing the ecologically vital Yangambi Biosphere Reserve, faces severe forest degradation due to a rising population, a short cycle of shifting cultivation practices and the high demand for charcoal. Local communities are experiencing increasing challenges in obtaining trees for charcoal production and other forest-based resources. CIFOR-ICRAF is addressing the challenges of the

Yangambi landscape through collaborative integrated landscape solutions, including sustainable woodfuel initiatives. This involves working directly with charcoal producers and their households to establish agroforestry systems for woodfuel (Mumbere et al., 2023), introducing improved carbonization methods (Schure et al., 2021) and facilitating the adoption of efficient cookstoves. It includes collaboration with a women's group that produces charcoal from sawmill waste at the *Compagnie Forestière et de Transformation* (CFT) sawmill in Kisangani.

Despite evidence of women's participation throughout charcoal value chains — as managers of trees and forests, as producers, transporters and traders, and as end consumers — there is limited gender analysis of this sector and gender considerations are rarely addressed in policies and interventions (Ihalainen et al., 2020). Women's participation in charcoal value chains is often characterized as a supporting role, or something that they do as a last resort. They generally benefit less from overall income generation from charcoal production or trading activities than men do. Due to socially constructed gender roles and norms, women and men tend to have different motivations, needs and opportunities in relation to the charcoal value chain (Ihalainen et al., 2021).

In Kisangani, women previously collected sawmill wood residues as firewood for cooking at home, reflecting the gendered responsibility of women and children for gathering firewood. Later, the women began selling the wood for charcoal production and small-scale carpentry, often enduring long waits at the company gate that required their flexibility and patience. This shift in tasks initially served as a survival strategy due to limited alternative income options and the lack of recognition for the extensive hours they spent on household tasks and supporting their families. Without organization or formal agreements with CFT on delivery, these long waits for wood residues often resulted in frustration and conflicts. While the company intended to support local communities by providing wood residues, it faced challenges due to tensions over distribution and the unmonitored flow of wood from the compound. Additionally, the traditional earth kiln method of charcoal production, commonly used in the region, was inefficient.

This article assesses the role of women in charcoal making from sawmill wood residues in Kisangani, and the gender aspects that determine the efficiency, equity and sustainability of their activities (Figure 1). It covers the period from September 2020 to December 2024, following a partnership between the women, CFT and CIFOR-ICRAF to organize the women into the *Association des femmes valorisatrices des déchets de scierie* (AFEVADES) and to improve their charcoal production. Data on processed wood quantities was collected, and interviews were conducted with all 20 AFEVADES members between November 2024 and January 2025. Women enumerators conducted the interviews, ensuring consent and anonymity, while acknowledging potential bias due to the involvement of the project facilitators. The study's findings aim to highlight gender dimensions and inform strategies for a more sustainable charcoal sector.

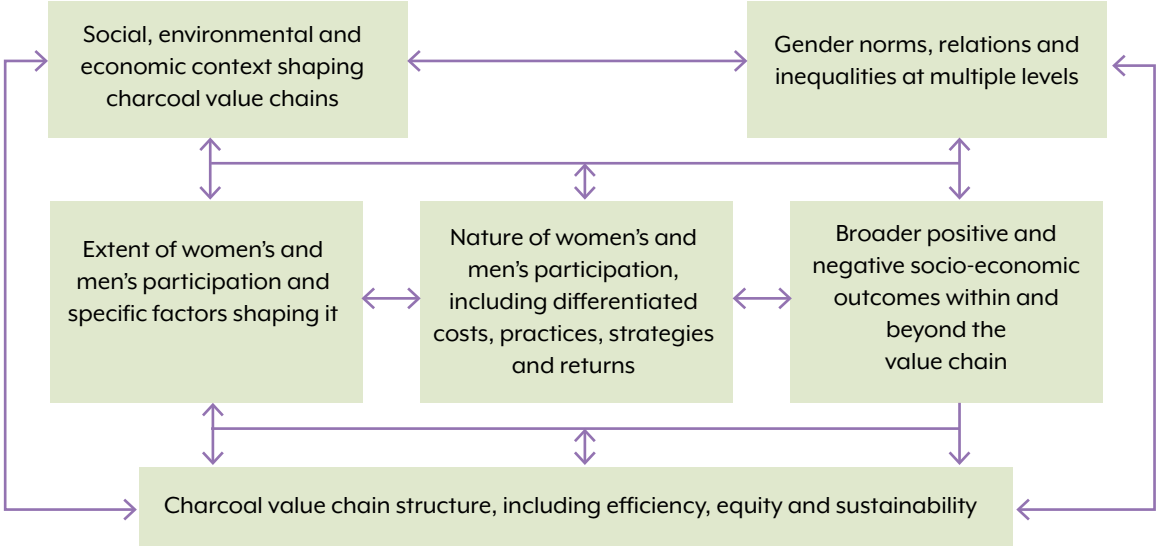

Figure 1. Conceptual framework for addressing gender equality in charcoal value chains
Source: Based on Ihalainen et al., 2021; Adapted from version designed by Laurent Nyssen

Loading wood in an improved traditional earth kiln. Photo: CIFOR-ICRAF/Axel Fassio

Efficiency of sustainable charcoal production from sawmill residues

The wood residues of the timber sawmill provided an economic opportunity for charcoal making for women who lived nearby, although obtaining these residues initially required long hours of waiting. Training, organization of the women and registration of their association AFEVADES in 2020 brought significant improvements in the efficiency of their activities, as reported by members.

Reliable, regular and exclusive wood access

After AFEVADES gained official status and organization, its members secured an exclusive arrangement and a regular supply of wood residues from CFT. This wood is provided free of charge, with women covering the collection and transportation costs. However, variations in the availability and quality of the wood continue, reflecting the operational patterns of the sawmill.

Organization

Women now follow a rotating schedule for collecting the wood, making the process more predictable and less time-consuming. Forming an organization not only helped secure the exclusive supplier agreement but also increased their visibility with other stakeholders, such as government officials, microcredit providers and clients. After receiving training in tax matters, AFEVADES members were able to renegotiate some of the taxes they had previously paid on charcoal production. Some internal organizational challenges persist, however, regarding wood processing schedules and pre-payments, stemming from the members' differing views of the organization's dual role as both an economic entity and a solidarity network.

Microcredit success

AFEVADES illustrates how access to microcredit can enhance activities and increase revenue. After receiving training in administrative and financial management, along with project-backed lower interest rates, the

association secured a USD 3,000 loan to purchase a three-wheeled motorbike for transporting wood and charcoal. Regular transportation fee payments to the association's treasury helped the members repay the loan in just 10 months, ahead of the agreed 12-month term. They are now applying for a second loan to buy another motorbike, and through the association's savings, the women plan to purchase land for their office and for income-generating activities. The microcredit institute, Coopec Meilleur Semeuer, has become their primary external partner, reflecting their growing independence from project support.

Improved carbonization techniques and quality

Before 2020, AFEVADES members used traditional earth kilns without formal training. The project provided training, bringing in an expert charcoal maker who effectively conveyed new techniques. It also provided improved earth kilns, which nearly doubled efficiency (from 14% to 25% dry-wood basis), and increased production and profits. Carbonization time was reduced from as much as 17 days to approximately five days. A brick kiln pilot project further improved efficiency and reduced processing time. Women co-invested in building two more brick kilns. Now, all members use improved kilns, with about one-third using brick kilns.

Quality and clients

Charcoal is sold both from homes and at a designated university sales point established through project support. This location serves a clientele who are more receptive to sustainable products; it also raises awareness of environmentally responsible charcoal. Customer feedback has been positive, highlighting both the product's quality and its sustainable sourcing.

Equity in participation

In terms of equity, women's and men's involvement in charcoal activities differs significantly from most charcoal value chains in the country, where men typically handle production and trade, while women are involved in packing and sales. The history of women waiting for wood residues to be delivered at CFT's front gate has given them a central role in the process. This role has been confirmed in the new organization of women and was reinforced by the exclusive arrangement of AFEVADES with the sawmill for obtaining wood residues. Members reported that women are involved in 95% of the activities, reflecting their significant control over the operations. However, specific tasks still follow a gender-based division of labour, with wood residue collection and sales carried out exclusively by women. The construction of the improved earth kilns (or the closing up of the brick kiln) and the transportation

Transporting wood from CFT to the carbonization location. Photo: CIFOR-ICRAF/Axel Fassio

of charcoal are carried out by men. The task of collecting the charcoal from the kiln and placing it into bags is shared by men and women.

These activities bring important socio-economic benefits to the women and their households (which are relatively large, with an average 11.4 people). Monthly net revenues from wood residue processing averaged USD 100 per member in 2019 and USD 108 per member in 2024, which is relatively high in this context, where most people are poor. A little over half of this revenue comes from charcoal production. Women report an average charcoal production of 16.5 bags per month per person, reflecting annual gross revenues of USD 2,257 per person. More than half of the members report an increase in income during the project period, attributing this to easier access to wood residues and significant profit margins. They specifically note that the financial training and access to credit have taught them how to calculate costs and generate profits. However, while most members have benefited from the new organization and operations, about one-fifth of the women, who previously had priority access through their husbands' employment by the sawmill, have seen a decline in their revenues since the new structure was implemented.

The significant charcoal revenues help women and their families cover daily expenses, including food, education, healthcare and household goods. More than half of the women reported constructing houses since 2020. They also purchased other relatively expensive consumer items, such as solar panels, generators, radios, furniture, phones and televisions, mostly in the past four years. In most cases, it was the women who made the decisions regarding these household purchases. Items like batteries and some motorbikes, however, were bought by men, and the husbands typically made the purchasing decisions for these items. This highlights that control over household spending lies with those who bring in the income; in many cases, this responsibility has been assumed by the women in recent years.

While charcoal production is often seen as a masculine, "dirty" and "tough" task in other places, the women who are members of AFEVADES feel respected for their work. They are well regarded because of their strong organization, high-quality products and substantial earnings. Both women and men want to join the association. Members believe that a women-led organization is beneficial due to its support system, including shared savings and a solidarity fund, as well as the mutual understanding, unity and organized shifts for wood delivery.

Sustainability of charcoal production by AFEVADES

Charcoal for the Kisangani market typically comes from surrounding forests and fallow lands cleared for agriculture; no sustainable sourcing practices are in place. AFEVADES's main contribution to environmental sustainability lies in the exclusive use of wood residues. These residues come from trees felled for timber in concessions under forestry management plans. Another significant improvement is that members now use enhanced carbonization techniques and brick kilns, which nearly double the wood-to-charcoal conversion efficiency of previous methods. Between September 2020 and October 2024, a total of 2,638 cubic metres of wood were transformed into around 574 metric tonnes of charcoal (see Table 1), equating to roughly 11,000 bags of sustainable charcoal for households in Kisangani (with an average weight of 52 kg per bag).

It can be assumed that these 11,000 bags of sustainable charcoal replaced an equivalent number of bags that would have otherwise been sourced unsustainably. This likely prevented the unsustainable harvesting of

Table 1. Volume of wood transformed and charcoal produced by AFEVADES, 2020–2024

Year (period)	Volume of wood (m^3)	Volume of sustainable charcoal produced (tonnes)
2020 (September–December)	360	78.3
2021	640	139.2
2022	768	167.0
2023	480	104.4
2024 (January–October)	390	84.8
Total	**2,638**	**573.8**

Collecting charcoal from the kiln. Photo: CIFOR-ICRAF/Axel Fassio

approximately 6,000 cubic metres of wood, part of which is nonrenewable, thereby contributing to the reduction of forest degradation and deforestation.

In terms of socio-economic sustainability, the activities are profitable and provide significant benefits to the women's households. However, it is important to note that only half of the women have other income-generating activities, showing their high dependency on a continuous supply of wood residues and the associated risks if that supply is disrupted.

In terms of the overall sustainability of the wood energy sector and the quantities produced by AFEVADES, the women's contributions remain modest relative to the total household demand in Kisangani, with annual production meeting the cooking energy needs of approximately 2,000 people. However, the introduction of a more sustainable charcoal product to the market sets an important precedent. It demonstrates the potential of this market, particularly when producers in villages, under the same sustainable woodfuel initiative, begin producing charcoal from their dedicated agroforestry woodlots starting in 2026.

Conclusion

In the charcoal sector, traditionally dominated by men, women in Kisangani have successfully engaged in charcoal production using sawmill wood residues. This article analyzes the gender dynamics and sustainability outcomes of organizing these women into an association, AFEVADES, highlighting their subsequent collaborations to improve sustainable charcoal production. The efficiency of charcoal production has improved through training, official registration as an association, and an exclusive wood supply agreement with the timber sawmill. As market opportunities for forest products grow, increased profitability is often accompanied by greater involvement by men. However, through active collaboration as charcoal markets expanded, women were able to maintain control over waste wood processing and retain decision-making power over their earnings. Facilitated delivery arrangements with CFT and access to microcredit further empowered the association, boosting operational efficiency and revenue. AFEVADES members report feeling respected, empowered and protected due to their strong organization and internal support system.

AFEVADES charcoal is more sustainable than traditional charcoal in Kisangani due to the exclusive use of wood residues and improved carbonization techniques. This reduces deforestation and greenhouse gas emissions while repurposing what would otherwise be waste wood. Socio-economically, the initiative creates jobs and income in impoverished areas, proving the value of local, gender-inclusive sustainability efforts.

Still, current production meets the cooking energy needs of only about 2,000 people per year, underlining the importance of scaling up. Despite its success, such sustainable charcoal initiatives remain limited and insufficient to meet the broader demand.

Policymakers and investors play a key role in advancing the following priorities:

- access to sustainably managed raw materials, such as agroforestry resources and sawmill residues;
- training programmes to improve carbonization efficiency for people with sustainable wood sources;
- promotion of cleaner cooking energy solutions, including sustainable charcoal and improved cookstoves; and
- development of market linkages and stimulation of consumer demand for sustainable alternatives.

The AFEVADES model demonstrates how sustainability, gender inclusion and economic empowerment can coexist. However, without broader adoption and policy support, sustainable charcoal alternatives will struggle to compete with unsustainable production. Investments and regulatory action are needed to scale up solutions and drive lasting social and environmental change.

Acknowledgement

In memory of our carbonization expert and friend Mpuruta-Ka-Tito (1954–2024). His carbonization training has been indispensable in driving effective change toward a more sustainable charcoal sector in Tshopo Province.

We would like to thank the members of AFEVADES for taking the time to respond to the surveys and group

Putting charcoal in bags. Photo: CIFOR-ICRAF/Axel Fassio

interviews. We thank CFT for their collaboration with the initiative and for contributing to our data collection. This work could not have been done without the flexible approach and efforts of enumerators Sarah Salumu and Julienne Kyakimwe.

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3.2

Women's association of the Alto Pindorama, Pará State, Brazil. Photo: Denyse Mello

Empowering women, enriching forests in the Amazon

The role of collective microenterprises

Denyse Mello and Lídia Lacerda

"Together we rise. Women's collective microenterprises in the Amazon aren't just transforming lives; they're reshaping futures and fostering sustainable communities for generations to come."

Woman leader of the Alto Pindorama association, Pará State

Introduction

In the Brazilian Amazon, women's collective microenterprises are crucial for economic empowerment, transforming the socio-economic landscape. These enterprises enhance women's financial autonomy and address gender inequalities, fostering community resilience and sustainability (Benería and Sen, 1982). By pooling resources and sharing knowledge, women in these collective enterprises gain increased access to economic resources, which leads to improved household income and living conditions (Sherman, 2006).

The Amazon, rich in cultural diversity, is home to many Indigenous and traditional communities that face significant socio-economic challenges. Despite comprising over 1.5 million people in the amazon region (IBGE,

2024), they have access to less than 0.1% of available credit (Souza and de Albuquerque, 2023), an 8% illiteracy rate, and ten times less access to university education than other regions do (IBGE, 2024). Collective microenterprises present a powerful solution to these issues (Bullough, 2006; Sathiabama, 2010). These initiatives also enhance non-material aspects of empowerment, such as self-esteem, bargaining power and relational dynamics.

Previous studies, such as those by Chen (1997) and Kaur et al. (2007), have established a framework for understanding empowerment as a multi-dimensional process, leading to better decision-making within families, increased financial independence, and stronger community participation. Women's involvement in economic activities is recognized as a pathway to greater agency and equality, affirming their essential role in rural development (Bryman, 2016). In this way, women emerge as leaders in and advocates for broader community issues, fostering a culture of empowerment throughout the Amazon.

This research enriches the understanding of how collective microenterprises affect women's economic empowerment, emphasizing their role as new economic agents. By integrating social and environmental variables within their entrepreneurial frameworks, these microenterprises act as catalysts for broader community transformation (CIFOR, 2013). This comprehensive perspective highlights the multifaceted benefits of microenterprise participation and underscores the importance of integrating economic, social and environmental considerations into development strategies aimed at fostering gender equality and sustainable growth.

New lens to look at women's empowerment in tropical forest regions

This article discusses a study (Mello, 2014) that consisted of interviews with women who participate in economic initiatives in two states in the Brazilian Amazon: Acre, with supportive policies for forest management (forest policy as well as incentives for small-scale forest management such

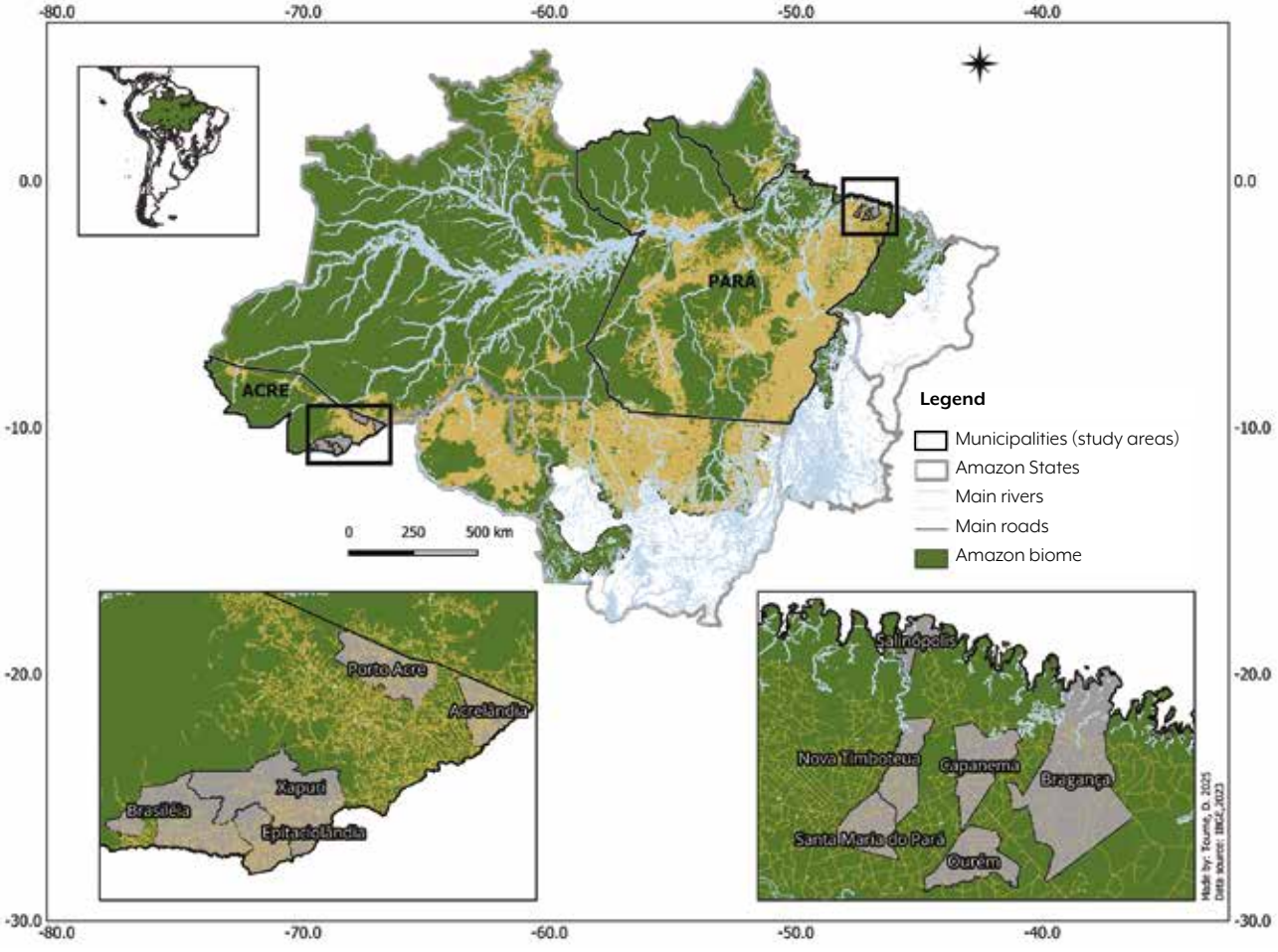

Figure 1. Case study location in the Brazilian states of Acre and Pará
Source: Daiana Tourne

as credit, technical assistance) and Pará, with grassroots initiatives (Figure 1). These contrasting approaches offer insights into community-led efforts and their impact on women's empowerment. Through interviews with 65 participants from 11 collective microenterprise groups — selected for their connections to women's organizations, sustainable practices and accessibility — the research highlights the material, cognitive, perceptual and relational changes these initiatives foster. These changes enhance individual agency and collective dynamics.

The study adopted a multifaceted approach to economic empowerment, integrating theoretical frameworks that highlight four dimensions: material, cognitive, perceptual and relational (Mello, 2014). This comprehensive perspective is crucial for understanding the complex nature of empowerment in the Amazon context:

1. Material dimension: This focuses on women's access to and control over financial resources and physical assets. Indicators include women's contribution to the household income from microenterprises and ownership of material capital such as land and productive assets.
2. Cognitive dimension: This examines the improvement of women's knowledge and skills. It's measured through participation in training programmes and women's increased awareness of their environment.
3. Perceptual dimension: This explores changes in women's self-esteem and self-confidence. It's evaluated through women's assessment of their income, relationships, freedom and roles in society. The psychological impact of this empowerment often leads to women mentoring others, creating a ripple effect in the community.
4. Relational dimension: This aspect examines changes in women's bargaining power and decision-making. Additionally, women's participation in microenterprises enhances their representation in community organizations and decision-making bodies.

This framework is useful to analyze the changes observed in women's empowerment process through microenterprise participation (Figure 2). First, change is experienced in access to and/or control over material resources and in level of income, satisfaction of basic needs, or earning capacity. In addition, women participants in microenterprises increase their knowledge as well as awareness of their environment. Gradually they perceive more about their own individuality, interests and value — in effect, their self-esteem rises, as well as it is hoped, the positive perceptions of others of their contributions and worth. Eventually, they can bargain more effectively for more equal or less exploitative relationships within their family and community (Mello, 2014).

Economic empowerment through microenterprises

Transformative changes across four dimensions

The involvement of rural women in collective microenterprises within the Brazilian Amazon has sparked profound economic empowerment, evident through material, cognitive, perceptual and relational changes (Mello 2014). These complementary dimensions illustrate how microenterprise participation transforms not only individual lives but also broader community dynamics.

Material dimension

At the core of economic empowerment is the material dimension, which involves women's increased access to and control over financial resources and physical assets. The 65 women engaged in microenterprises reported significant income gains, with family earnings ranging from USD 272 to USD 1,640 per month; around 60% came from women's work in microenterprises (Mello, 2014). This additional income provided greater financial stability and autonomy, allowing women to make more informed decisions about household spending and investments. For instance, 16% of women interviewed invested in productive assets such as açai fruit processing equipment and beekeeping supplies, further boosting their household incomes (Mello, 2014).

Moreover, the collective nature of these microenterprises allowed women to combine resources and set up local marketplaces, promoting economic growth within their communities. These investments not only benefited individual families but also created sustainable income streams for multiple households, enhancing overall economic resilience. By managing their income and assets, women lessened their financial vulnerability and were able to support their children's education and obtain health care. Moreover, through support networks within the communities, these benefits were also shared with other women in need.

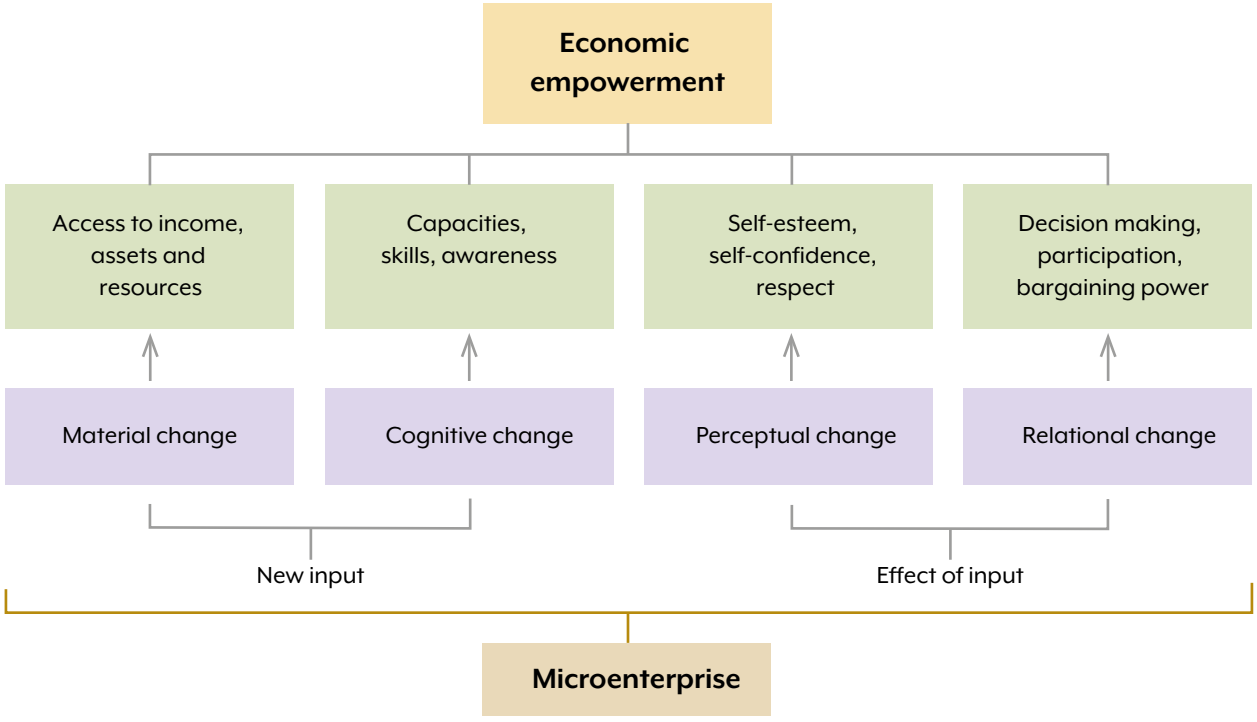

Figure 2. Theoretical framework of effects of microenterprise on women's economic empowerment
Source: Mello, 2014. Based on Kaur et al. (2007) and Chen (1997).

Cognitive dimension

This focuses on the enhancement of women's knowledge and skills through their participation in microenterprises. Training programmes, provided by women's organizations, governmental institutions and the private sector, equipped women with technical skills in areas such as agroforestry, beekeeping and handicrafts. Training usually involved three to four modules, each lasting three to four days. These educational opportunities improved women's ability to manage and expand their businesses and increased their awareness of market dynamics and sustainable practices.

Approximately 72% of these training programmes were conducted within the community, allowing family members, including husbands and children, to participate alongside the women. This communal learning environment facilitated the sharing of knowledge and skills, fostering a culture of continuous improvement and collaboration. As a result of ongoing training, women developed greater self-efficacy and resource management capabilities, enabling them to navigate economic opportunities more effectively and advocate for their needs, within both their businesses and their communities (Mello, 2014). The ongoing training and education are essential for the economic empowerment of women; this is evidenced by the noticeable changes in their lives and society, as described by a participant in women's Group D, Nova Timboteua, Pará: *"I never dreamed of working with bees in my life. Because I got training, today I know how to work with bees, what kind of plants you have to have to get honey, because you know you want to reforest, not burn the forest, if you want to earn money."*

Perceptual dimension

Perceptual empowerment pertains to changes in women's self-esteem, self-confidence and perceived value within their households and communities. The participation of women in the enterprises has led to greater recognition of and respect for them by both the community and their families. This heightened sense of worth was largely attributed to their financial independence and active roles in economic activities, which repositioned them as vital contributors to household and community welfare (Mello, 2014).

Products from rural women's microenterprises from the sustainable use of the forest, Belém, Pará, Brazil. Photo: Denyse Mello

Women's increased self-confidence often led them to take on leadership roles and mentor others, creating a ripple effect of empowerment within their communities. This empowerment was evident in how women perceived their economic participation as bolstering relational equity and mutual respect. Several testimonials, such as the following one from a participant in the Alto Pindorama Association, in Group B, Capanema, Pará, highlight this impact:

"He has changed a lot; before, he never heard me. Sometimes he created conflict for me to participate in any meeting or group. Because of this I like the model of participating in a group, and I can produce at home and we involve the whole family in meetings and training."

Participant, Group B

Relational dimension

This encompasses changes in women's bargaining power, decision-making roles and social dynamics within households and communities (Deere et al., 2012). The study found that 64% of women reported improved joint decision-making on financial matters within their households. This collaborative approach promoted household equity and reduced women's vulnerability to economic and domestic exploitation (Mello, 2014).

Women's active involvement in microenterprises also enhanced their representation in community organizations and decision-making bodies. By forming alliances and women-led cooperatives, participants advocated more effectively for fair market prices, access to government support, and equitable resource distribution. These collective actions amplified women's

voices in institutional negotiations, ensuring that their interests were adequately represented and addressed.

In addition, the robust partnership between these micro-enterprises and women's organizations, Catholic Church groups, rural and urban women's associations, as well as the feminist movement, provided participants with access to training, knowledge-sharing opportunities, and participation in events hosted by these entities. This collaboration has greatly enhanced women's capacity to advocate for pressing social issues, such as education and health care, while also elevating their visibility and influence within local governance structures. Furthermore, it has strengthened their ability to advocate for collective interests, including infrastructure development and the expansion of market access. A participant in the Santa Maria Association, Women's group, Santa Maria, Pará, highlights this impact:

> ***"Before joining the microenterprise, I had no say in household matters. Now, my husband and I discuss everything together, from expenses to investments."***
>
> Participant, Santa Maria

The role of women's microenterprises

Reducing environmental pressure and enhancing forest conservation

Women's collective microenterprises in the Amazon contribute to environmental conservation and economic empowerment. These enterprises enhance women's knowledge and skills in natural resource management through training in sustainable practices. Examples include implementing agroforestry systems that increase food security and biodiversity, reducing or eliminating agricultural burning, reforesting degraded areas, and conducting environmental campaigns to protect springs and rivers. The results of the study demonstrated that the area worked by rural women in their microenterprise activities represented 21% to 70% of total household land area, varying widely depending on local conditions, which affected the size of property areas (Mello, 2014).

Rural women's collective microenterprises engaged in several forest and natural resource management activities. Specifically, 34% worked with forest management, 29% were involved in agroforestry, 20% combined medicinal plant management and agroforestry, and 17% engaged in a combination of livestock management and agroforestry activities (Mello, 2014). These activities varied by location: in extractive reserve areas, women primarily worked with forest products such as seed collection, resin extraction and clay and fallen timber collection for handicraft production. In official agricultural settlement areas, women focused on implementing agroforestry practices that combined apiculture, fruit tree cultivation, collection of medicinal plants, and mini agro-industries to add value to agroforestry products.

Additionally, 63% of women reported that agroforestry systems boosted their families' food security by enhancing the supply of animal protein and vegetables and fruits (Mello, 2014). These practices illustrate the positive impact of women's collective microenterprises on sustainable resource management in the Amazon region. The study found that 42% of the households of the women interviewed changed their land-use management to avoid deforestation and fire use, and also adopted other practices — investment in land management, soil fertility, reforestation, etc. — potentially reducing some of the more important sources of degradation and carbon emissions in the Brazilian Amazon region (Mello, 2014).

Conclusion and recommendations

Women's stewardship of natural resources in the Amazon links economic empowerment to conservation, benefiting both livelihoods and ecosystems. Activities such as agroforestry and eco-friendly crafts support biodiversity while generating income. Collective microenterprises enhance leadership skills, influence policy-making, and address issues such as land rights and resource access. Challenges include limited access to credit, market information, and formalization processes, highlighting the importance of cooperatives and of partnerships with NGOs and financial institutions.

Policymakers and practitioners play key roles in supporting women-led enterprises through capacity-building, inclusive land policies, mentorship programmes and research into long-term gender equity impacts. Holistic support from governments, NGOs and the private sector can amplify the transformative impact of these initiatives, driving sustainable community development and gender equality.

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3.3

Women involved in forest regeneration and in the supply chain for improved cooking stoves. Photo: Métanga Justin Dembélé

How gender-responsive solutions are reshaping Mali's landscapes

Silvia Lanzarini

Gender-responsive climate action can generate more effective and sustainable results... When women lead, forests thrive.

Introduction

In terms of the gender-responsive management of forests and its resources, this article presents key approaches, results and opportunities of the Climate and Energy in Mali project (CEMALI) led by the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women). Implemented between 2017 and 2019 under the leadership of the Government of Mali, CEMALI partnered with the Renewable Energy, Environment and Solidarity Group (GERES) and the private sector with funding by the Governments of Sweden and Norway through the Mali Climate Fund.

CEMALI aimed to reduce deforestation and greenhouse gas emissions through women's empowerment. It proposed an innovative climate-resilient and gender-transformative approach to reforestation by placing women and women's groups at the centre of activities as essential actors in establishing and managing regenerated forests and reducing the impact of logging on the environment.

The project contributed to restoring and preserving biomass resources, supporting the energy security of households in both rural and urban areas in the context of climate change through promoting women's entrepreneurship and leadership across the biomass value chain. This involved extensive work at the community level to support women's role in local economies, reduce their vulnerability related to deforestation and air pollution, build their capacity in leadership and management, and leverage Indigenous competencies in forest management.

Context

Mali is located in the Sahel region and is characterized by very large demographic growth, especially in urban areas, and by nearly 80% of its population living on less than USD 2 per day (CGIAR, 2016). Severe consequences of climate change, such as forest degradation and loss of biodiversity, play a critical role in the high levels of vulnerability of the people of Mali, which is ranked 177th of 178 countries in the Environmental Performance Index (BTI, 2016). Women and girls experience the greatest impacts of climate change, which amplifies existing gender inequalities and poses specific threats to their livelihoods, health and safety (UN Women, 2022).

In Mali, forests cover about 11% of the territory (World Bank, 2020), and 79.4% of these forests are in a state of severe degradation (UNEP, 2018). The remaining 20.6% of forests, despite being in a relatively stable state, face severe pastoral pressures, poaching and gold mining (MEADD, 2014). Agricultural clearing, extensive wood cutting (primarily for energetic consumption), bush fires and overgrazing have significantly contributed to deforestation, as have climate change effects. Only 2.8% of these forests have management plans in force, and these have little or no monitoring. Despite the Malian government's efforts to limit deforestation through multiple national strategies, the country loses 100,000 ha of its vegetation cover each year (NEF, 2017). From 2000 to 2020, Mali experienced a reduction of 256 ha (3.3% of the country's total) in tree cover (Global Forest Watch, 2020).

Women leaders, members of a village committee on forest management. Photo: Métanga Justin Dembélé

Implications of unsustainable wood use for energy production

In Mali, only 1.2% of the population has access to clean fuels and technologies for cooking (IEA et al., 2024), compared to 20.7% in the rest of sub-Saharan Africa (UN Women, 2022). Most households in both urban and rural areas lack access to alternative energy sources such as gas or electricity (UNEP, 2018). As a result, wood remains the primary source of domestic energy. Over 70% of the country's energy needs — especially for cooking and agricultural processing — is met through wood, charcoal and agricultural residues. This reliance on wood has driven a steady increase in national demand, rising from 4.5 million tons in 1990 to 7 million tons in 2006, with the city of Bamako accounting for 75% of the country's consumption of dry biomass (UN Women et al., 2017).

The increasing demand for dry biomass to meet energy needs places Mali's forests at significant risk. The widespread use of primary wood materials as fuel has far-reaching social, economic and environmental consequences for both the population and the planet. It leads to forest degradation, loss of ecosystem services, impoverishment of local communities, and health issues caused by indoor air pollution and by the higher greenhouse gas emissions associated with climate change (FAO, 2022).

Women and girls are particularly vulnerable in this situation. They, along with children, are disproportionately exposed to indoor air pollution from cooking in confined spaces, especially when biomass combustion is incomplete. Additionally, deforestation forces women and girls to travel increasingly long distances to gather resources such as fuelwood, water and livestock feed. These longer journeys expose them to a heightened risk of gender-based violence and exacerbate their disproportionate workload of unpaid care and domestic chores (UN Women, 2023b), significantly increasing their time poverty (i.e., the lack of time needed to meet basic requirements for rest and leisure). In Mali, women account for nearly 80% of the total time spent on unpaid care and domestic work, spending an average of 21.6 hours per week on these tasks compared to just 5.7 hours for men (UN Women, 2023a). This disparity, with women spending

Woman using the three-stone cooking stove. Photo: Gaoussou Haïdara

almost four times as much time as men on unpaid labour, prevents them from engaging in paid work, education, rest or leisure, and perpetuates their income poverty. Women in greater income poverty must compensate for the lack of public services or their lack of access to or inability to afford timesaving technologies through multitasking and increased unpaid care and domestic work, often under harsh physical and environmental conditions (UN Women, 2019).

Development of a sustainable women-led bioenergy sector

CEMALI's innovative approach has contributed to a gender-just transition to a green economy in Mali by supporting women's entrepreneurship through clean-cooking initiatives in both urban and rural areas. The innovation lies in its sectoral approach, which simultaneously addresses both supply and demand for fuelwood, and thereby reduces the pressure on dry biomass for energy consumption. CEMALI influenced the demand side by developing a sustainable bioenergy sector to meet market needs for natural resources. This included creating an entire supply chain for improved, locally made cooking stoves, which enabled savings of 25% to 70% in charcoal and firewood consumption. On the supply side, initiatives promoting forest regeneration led to the establishment of managed forests, with strong involvement by women as forest managers.

Addressing each step of the supply chain of improved cookstoves — from tinsmiths to ceramists and retailers — facilitated the broader development of the entire supply chain. A variety of improved, energy-efficient and time-saving cookstoves were supported and developed through ten clean-cooking initiatives, resulting in the production of 114,315 improved cookstoves. The project supported technical, entrepreneurial and managerial training for 473 women stove builders and facilitated their aggregation in seven associations.

Women's involvement was also strengthened as vendors of metallic stoves with ceramic inserts, which retain heat much longer than traditional stoves, reducing wood use by 70%, and minimizing smoke and harmful burns. Women also played a central role in the production, distribution and maintenance of three-stone stoves, which are built entirely by local women using soil and natural materials. These three-stone stoves were notable for the close collaboration between the women service providers and the women beneficiaries. This collaboration created a valuable opportunity to transfer essential skills and knowledge, enabling beneficiaries to properly maintain the stoves and protect them from severe weather conditions.

Women's involvement in cookstove production led to better-performing stoves compared to when men made them, since women, being the primary users, had a deeper understanding of their needs. This demonstrates that including women throughout the value chain, including production, brings additional benefits, contributing to both social and economic improvements. Strengthening women's roles in the fuelwood-energy sector at every step of the improved cookstove supply chain created job opportunities, increased household income, and expanded access to non-traditional green value chains.

Many of the women who participated in training travelled to Burkina Faso and other neighbouring countries to train more women in building the three-stone improved stoves. This represents the tremendous success of the project and challenges discriminatory social norms about women, who are now valued and recognized as active contributors to the development of their households and their communities.

Additionally, the three-stone cookstoves produced during and after the project are systematically assigned serial numbers to enable the future acquisition of carbon credits. This creates an opportunity for women stove builders' groups to use these carbon credits to launch and sustain income-generating activities for the women members of the newly created associations.

Women's role in reforestation and management of forests

CEMALI successfully achieved the objectives of regenerating forests, stimulating the establishment of managed forests and reducing the impact of logging on the environment. The project underscores the importance of supporting communities in recognizing and valuing women's efforts as stewards of forests, as well as their crucial contributions to the effective use of forest resources and reforestation — key strategies in combating forest degradation and the effects of climate change.

Thanks to CEMALI, women participants effectively embraced their role as forest managers, and engaged in community engagement initiatives focused on reforestation and forest regeneration. This was made possible by leadership training and activities aimed

at raising communities' awareness of the importance of reforestation in addressing the negative impacts of climate change.

Women also directly contributed to reforestation by enhancing their skills in nursery management for plant production and in tree planting. Their inclusion in forest management committees and related initiatives led to the reforestation of 1,105.6 hectares throughout the two years of the project.

The first phase of reforestation involved the production of 178,554 plants by 976 nurserywomen and 421 men, monitored by project agents with the support of Forestry Department authorities. The second phase saw the planting of 45,599 forest trees, 38,021 income-generating trees, and 37,655 plants that formed 37 kilometres of natural hedges. This phase achieved a very successful survival rate of 77% for the transplanted trees, and culminated in a partnership agreement with water and forestry services for their ongoing involvement in monitoring the reforested plots.

In terms of sustainable management of forests and natural resources, the project supported the development of six community plans with women in leadership positions. Women also established their presence on forestry committees, which contributed to the greater sustainability of the project's results and impact. Their involvement as stewards of forests was instrumental in raising awareness and building skills for the sustainable use of forests and natural resources. This was achieved through their active participation in community-level work and in tontines, traditional solidarity-based financial groups at the local level.

Local studies using the Accelerated Participatory Research Method (MARP) formed the foundation for developing the community plans. These studies provided analyses of the environment in its current state, including details on flora, fauna, hydrography and local climate, and also on population, production activities, social infrastructure, and local decision-making structures. Assemblies were held with village leaders, local authorities, women and youth associations, NGOs and community members to discuss the issues related to forest sustainability

Forest regeneration (eucalyptus). Photo: Métanga Justin Dembélé

and management and deliberate on mutually agreed solutions.

These discussions focused on principles of consensual management for degraded areas to allow for the sustainable integration of agriculture and environmental preservation, restoring vegetation while enhancing the resilience of local populations to the harmful effects of climate change, and increasing the potential of protected plots. Community plans identify ten-hectare forest plots, which are protected from exploitation for a period of ten years.

The plans outlined permissible actions within the protected plots, such as tree planting, collecting ripe fruits and walking, as well as forbidden actions, including tree cutting, hunting, collecting unripe fruits and dried leaves, and extracting traditional herbs (unless these are not found elsewhere and collection is authorized by the village chief). Village committees were assigned the responsibility of monitoring adherence to these rules, with penalties for misconduct outlined in the community plans. The plans also include a dissemination strategy to inform all community members about them, ensuring greater ownership and accountability. Additionally, income-generating activities were proposed to compensate for the loss of exploitation of parts of the forest, including the production of improved stoves, beekeeping, soap production, aquaculture, weaving, and post-harvest transformation of products.

The reforestation efforts were paired with activities focused on improving charcoal extraction from trees using environmentally friendly techniques. These new methods promote tree regeneration instead of causing tree death, as was the case previously. The project also helped form 12 cooperatives of foresters and charcoal producers, who had mostly been working informally using unsustainable methods. Through the project, members learned improved techniques for carbonization and charcoal extraction, as well as sustainable forest resource management practices. This knowledge enabled them to optimize the use of forest resources, thereby reducing pressure on the forests. As a result, a more sustainable carbon supply chain was established within the formal market.

New opportunities for women in forestry

The CEMALI project demonstrates that placing women at the centre of forest management and reforestation efforts leads to stronger social, economic and environmental outcomes. By actively engaging women in the regeneration of forests, the project not only increased forest cover in Mali, but also improved the sustainability of these efforts through community-driven approaches. Women's leadership in reforestation activities resulted in higher tree survival rates and more sustainable forest-use practices, as they integrated traditional knowledge with newly acquired forest management skills. This success underscores the importance of recognizing women's stewardship in environmental conservation and climate resilience strategies.

The environmental impact of women's participation in the project is key. By reducing reliance on unsustainable biomass energy and promoting reforestation, the project contributed to mitigating climate change and reducing greenhouse gas emissions. Women-led forest management also helped combat deforestation, helping local ecosystems to recover and sustain livelihoods that depend on natural resources. Moreover, the well-planned involvement of women in biomass resource management directly addressed the root causes of deforestation, leading to long-term environmental benefits.

Beyond environmental gains, the project highlighted how women's economic empowerment reinforces positive social and economic outcomes. Women-led enterprises in the clean cooking sector not only created new income-generating opportunities, but also strengthened local economies by integrating gender-responsive innovations into energy solutions. The introduction of improved cookstoves, managed primarily by women, led to significant reductions in firewood consumption, alleviating the workload associated with resource collection and enhancing personal and household well-being. Furthermore, the transfer of skills within and beyond Mali, with trained women supporting capacity-building initiatives in neighbouring countries, underscores the project's transformative potential at the regional level.

The CEMALI project serves as a compelling example of how gender-responsive climate action can generate more effective and sustainable results. Compared to conventional reforestation and energy transition interventions that do not prioritize women's empowerment, the inclusion of women has led to more resilient social structures, improved environmental outcomes and increased economic opportunities. This evidence highlights the necessity of integrating women's leadership and participation in all climate mitigation and adaptation initiatives, ensuring that their contributions are recognized, supported and scaled for broader impact. The project's success reinforces the broader imperative: when women lead, forests — and communities — thrive.

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An Anindilyakwa woman holding a piece of bark with medicinal properties. Photo: Giselle Cruzado Melendez

3.4

Hybrid economies in practice, Groote Eylandt, Australia

The role of social enterprises in supporting Aboriginal women

Giselle Cruzado Melendez

"Bush Medijina allows Aboriginal women to work, to set the rules and the standards for how they work. They don't have to try and fit into the non-Indigenous way of working; they sort of set their rules and standards and values."

Participant 9

Introduction

Some 15% of Australia's Indigenous people (Aboriginal and Torres Strait Islander peoples) live in remote areas, with limited mainstream economic opportunities (Australian Bureau of Statistics, 2021b). "Indigenous people" refers to Indigenous groups worldwide, including both Aboriginal and Torres Strait Islander peoples of Australia, while "Aboriginal people" refers specifically to Indigenous people of the Australian continent. In this context, there is growing recognition of the value of hybrid economies, drawing from each of the market, state and customary components of the economy (Altman, 2001) to meet the diverse needs of Indigenous communities. This approach is particularly relevant in contexts where Indigenous communities engage with both contemporary economic structures and traditional practices to create and nurture sustainable development opportunities.

Globally, growing attention is being paid to the role of social enterprises (SEs), both individual and community-based, in addressing socio-economic disadvantages. SEs are often defined as businesses with social purposes, using economic means to foster broader socio-economic, political and cultural agendas (e.g., Berkes and Davidson-Hunt, 2017). A broader definition of SEs focuses on entrepreneurship as "an activity, behaviour or process which can be linked to new ethical and political possibilities" (Essers et al., 2017, p. 2).

This article draws on research with an SE led by Aboriginal women on Groote Eylandt, a remote island in northern Australia. The SE, Bush Medijina, relies on a hybrid economy that combines government support, mining royalties and traditional knowledge for its operations and to deliver social benefits. At the heart of its mission is the preservation of traditional women's knowledge, and the application of this knowledge in transforming native medicinal plants into commercial cosmetic products. The article illustrates the importance of this SE in the dual roles of creating long-term value for the Indigenous women and their community, and contributing to the maintenance of land management practices that depend on traditional knowledge and cultural connectedness.

Background

Groote Eylandt, part of the Groote Archipelago, is the largest island in the Gulf of Carpentaria and is located off the east coast of Arnhem Land in northern Australia (Figure 1). It is a remote location, approximately 630 km and 1,000 km from the nearest major cities of Darwin and Cairns, respectively. Compared to other regions in Australia, most of the ecological landscapes in the Gulf of Carpentaria maintain unaltered. The region is characterized by a monsoon climate, with very hot wet and humid summers and dry mild winters. With savannah woodlands and monsoon vine forests, the gulf is home to more than 900 plant species, more than 150 marine fish species, and at least 330 terrestrial vertebrate species (Anindilyakwa Land Council, 2025).

Groote is home to the Anindilyakwa people, the Traditional Owners of the island. They comprise approximately 1,600 people from 14 clans, distributed between 7 communities; Angurugu, Umbakumba and Milyakburra are the largest of these (Australian Bureau of Statistics, 2021a). The Anindilyakwa people have been in contact with Macassan trepang traders, from what is now Indonesia, since at least 1600 (May et al., 2009). In 1921, the Church Missionary Society established a settlement, and, in 1963, mining exploration was followed by the development of a manganese mine (Cole, 1992).

Subsequently, Groote Eylandt has been characterized by a hybrid economy: corporate mining operations, with a predicted lifespan to 2035; the state, through public institutions such as schools, and health care and welfare providers; and the customary economy, represented by Aboriginal practices such as fishing, hunting and plant gathering. The conjunction of these three economies presented the opportunity for the Anindilyakwa people to take advantage of the flow of mining royalties to the community, and channel them into the generation of programmes that create long-lasting benefits. Royalties are distributed mainly between the Anindilyakwa Land Council (ALC) and the Groote Eylandt Aboriginal Trust (GEAT). Among other activities, these organizations allocate funds to eligible Aboriginal corporations and enterprises through annual competitive processes.

Research was conducted with Bush Medijina, which is located in Angurugu. The author visited Groote Eylandt

Figure 1. Groote Eylandt and main communities
Source: Jonah Lafferty, Anindilyakwa Land Council

between 2022 and 2024 as part of her PhD studies, and spent time with Bush Medijina participants (ten Aboriginal and five non-Aboriginal women) in their daily activities. In doing so, the author sought to understand the purpose and value of these women's participation in the SE from their perspectives.

Bush Medijina

Bush Medijina is a social enterprise led by the Anindilyakwa Services Aboriginal Corporation (ASAC); it is governed by a board of seven Anindilyakwa women elders and supported by one non-Aboriginal woman who is CEO. ASAC employs Aboriginal women living in Angurugu and non-Aboriginal women from the township of Alyangula, where mine workers and their families live. The corporation's employment options are flexible, offering full-time, part-time or casual roles. The number of employees is typically around ten women at any one time. Residence in Angurugu is restricted to Traditional Owners and their relatives. Non-Aboriginal women who live in Alyangula travel to Angurugu to coordinate with Bush Medijina members.

Bush Medijina harnesses the Anindilyakwa people's traditional knowledge of medicinal plants, which has been passed down through generations. These plants hold ecological significance (Levitt, 1981), and their use is central to preserving women's roles in Aboriginal society. According to Anindilyakwa Lore (a set of stories that involve the creation time, the connectedness of humans and non-humans, and their obligations to a particular place), certain plants are harvested exclusively by women — a part of what is referred to "women's business" — and collected in accordance with a seasonal calendar.

Native plants harvested by women are processed into skincare and hair products. The botanical ingredients are extracted through chemical processes and combined with other components, such as coconut oil, sourced from outside the island. Bush Medijina products are then sold online and to retailers nationally. All revenue generated from sales is reinvested in the corporation to cover key operational expenses and the social programmes that ASAC oversees.

Mining royalties, which are distributed through ALC and GEAT, are the primary source of funds for ASAC operations, and thus for Bush Medijina. The amount received by the corporation from ALC and GEAT varies each year, subject to the income generated by mining operations. Typically, these two funding sources contribute more than 70% of the ASAC budget (based on conversations with ASAC's CEO). Funds are distributed among Bush Medijina and other social programmes; individual allocations are not reported.

Sample of skincare and haircare products by Bush Medijina. Photo: Giselle Cruzado Melendez

The state plays various roles in the hybrid economy of Groote Eylandt. In addition to providing education, health care and infrastructure services, and jobs in government institutions, the state also manages a welfare system to support Anindilyakwa people. One example of state involvement is the Anindilyakwa Indigenous Protected Area (IPA). These 10,000 square km of land, reef and ocean are managed according to Traditional Owners' objectives by the Anindilyakwa Land and Sea Rangers. The positions and operations are funded jointly by the Australian and Northern Territory governments and the Anindilyakwa Land Council.

The Bush Medijina value chain (Figure 2) is based on a collaborative effort between Aboriginal and non-Aboriginal women. The non-Aboriginal women involved live on Groote Eylandt and the mainland.

Like any successful small-scale business, Bush Medijina faces market pressure to increase production in order to meet demand. To maintain its values and production levels, Bush Medijina has been promoting a market based on "conscious consumers" — one that provides products from low-volume harvesting while focusing on the social benefits generated by the enterprise.

Bush Medijina's contributions to Anindilyakwa society

Enhancing well-being

Anindilyakwa women have stressed the benefits of having a dedicated physical space where women can connect, share and support one another, leading to significant improvements in their mental health. Participants describe the production facility as a safe, women-led space where they feel comfortable and protected, particularly during times of tension within their community.

Cultural norms often see women as primary caregivers for children and elders within their extended families, especially when relatives face difficulties. As a result, many women temporarily leave paid employment to take on the unpaid, often unrecognized, task of caregiving (Klein et al., 2023). Bush Medijina's governance system offers women the flexibility to return to work when they are ready. This flexibility enables women to continue with paid work while upholding cultural practices.

Preserving culture and land-management practices

In Aboriginal culture, land management (Cruzado Melendez and Kanowski, 2022) — referred to as looking after, or caring for, Country (Kerins, 2012; see also Rose, 1996) — encompasses activities such as harvesting plants and animals, fire management, and controlling feral animals. The word *Country* in this context refers to traditional lands where Aboriginal people connect to each other and with beings other than humans. These practices are widely recognized in Australia for their role in conserving ecosystems, managing invasive flora and fauna species, and promoting the regeneration of native plants that attract animals to be hunted for consumption (Steffensen, 2020).

Bush Medijina harvesting practices are deeply embedded in a complex system of kinship and are guided by Aboriginal cultural protocols. Aboriginal women hand-harvest plants after consultation with the Traditional Owners of the land on which the plants grow. The

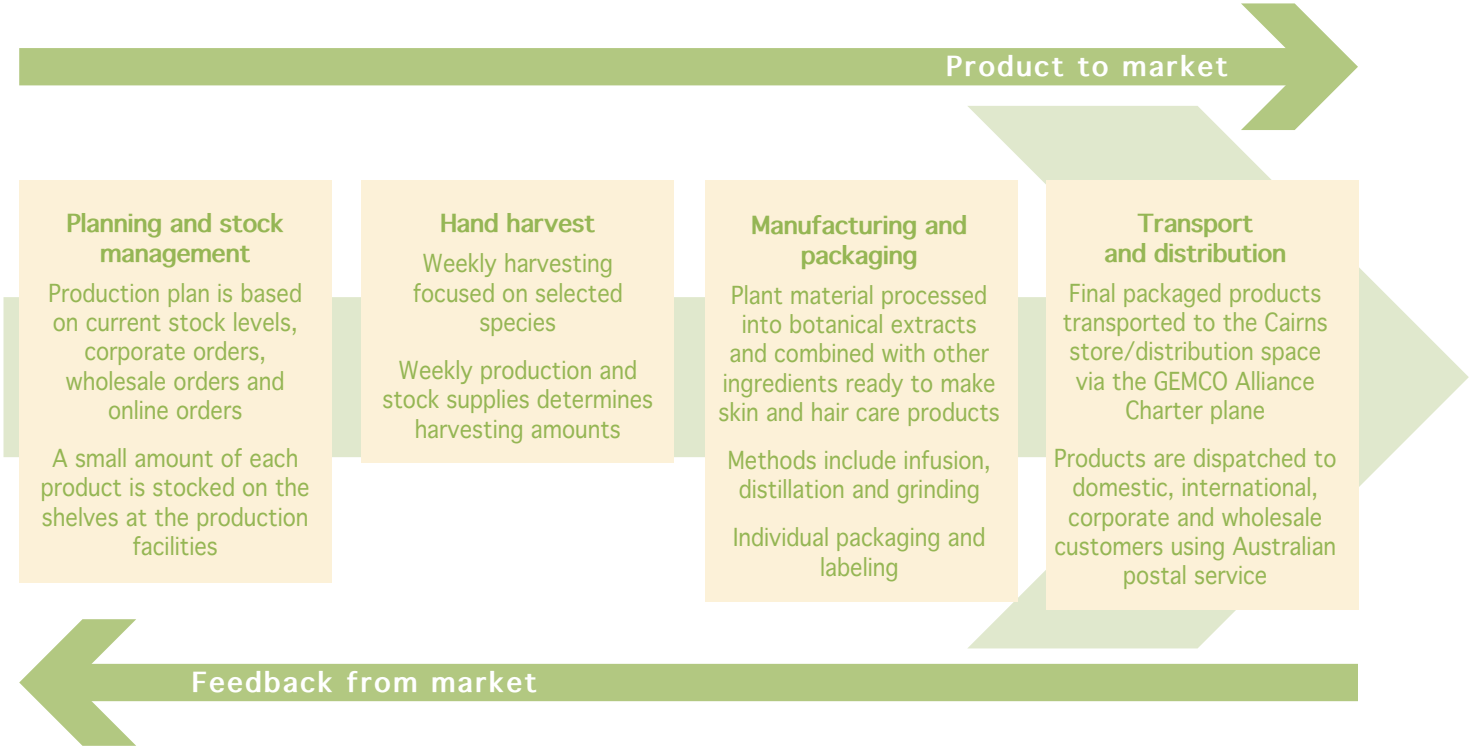

Figure 2. Simple representation of the Bush Medijina value chain
Source: Based on Giselle Cruzado Melendez

The author at the production facilities in Angurugu. Photo: Giselle Cruzado Melendez

consultations ensure a deliberative process to assess their Country's suitability for management (e.g., Pyke et al., 2018). These practices also include reading the indications of plant health and assessing the time needed for vegetation to recover from wildfires. Participants reported that they harvest species only when they observe an abundance of regeneration; since most of the harvest is leaves from shrubs and trees, regrowth is usually rapid.

Some of the medicinal plants used by Bush Medijina are part of women-only tasks. This role and its associated knowledge are preserved and transferred to the younger generations of women, who accompany their elders and relatives in visits to their traditional lands. These visits also allow for a spiritual connection between these women and their ancestors, who they feel are present in those lands. As one participant observed: "When we see the *sugarbag* (honey from native bees) on the treetop, I said, 'sorry, I am gonna cut you; it is my food, inside,' and I cut the tree, so we have to talk with the heart, speak to the plants or animals."

Some studies identify issues with the sustainability of the harvesting of non-timber products (e.g., de Mello et al., 2020). Here, locally led governance and management are likely to result in a low ecological impact from this harvesting due to its small-scale nature and the Aboriginal people's sense of connection with both human and non-human entities. This is illustrated by the case of gathering turtle eggs by the Yolngu people in nearby Arnhem Land. Since turtle eggs are part of a kinship system in which men, women and children and Country are one, the eggs are gathered with respect, in limited numbers, and in ways that reinforce the collectors' responsibility and care for others in the community (see Suchet-Pearson et al., 2013).

Strategies to overcome key challenges

Like many other Indigenous SEs, Bush Medijina faces multiple challenges (Logue et al., 2018); a major strategic issue is the finite life of the mine and its associated royalty stream. Anindilyakwa women are implementing several strategies to continue Bush Medijina operations when mining ceases.

Geographical isolation poses a significant challenge for community enterprises that seek access to external markets. The remoteness of Groote Eylandt makes it particularly difficult to transport products, equipment and raw ingredients to and from the island. However, the support of mining operations and local shipping services proved crucial in overcoming these barriers. Aboriginal corporations, including ASAC, effectively leveraged the concept of corporate social responsibility to engage these stakeholders, securing their support in facilitating essential transport and delivery operations.

Recognizing the impending closure of mining operations, Bush Medijina partnered with the mining company in 2024 to open a physical store in Cairns, a high-traffic tourist destination on the mainland. The Cairns store sells Bush Medijina products, as well as items from other Indigenous producers. It serves as a central hub for assembling final products from the island and dispatching them to domestic and international markets.

The partnerships between Aboriginal women from Anindilyakwa and non-Aboriginal women, and the strategic use of the internet since the social enterprise's inception, have been instrumental in the development and continuation of Bush Medijina. Partnerships with non-Aboriginal women have been built based on mutual objectives, such as creating meaningful employment opportunities for women from diverse cultural backgrounds who share similar responsibilities.

In this way, Bush Medijina can be characterized as a hybrid institution, as suggested by Altman (2005). It operates between two worlds — emerging from and representing enduring interactions between Aboriginal and non-Aboriginal cultures, and bridging cultural, commercial and geographic contexts.

Conclusions

Understanding the hybrid economy in which Bush Medijina operates illustrates the opportunities it provides to diversify the economies and livelihoods of the Anindilyakwa people while maintaining their cultural traditions. Bush Medijina participates in the hybrid economy by integrating state support with mining royalties, market-driven product development, and customary land management practices.

Bush Medijina is an example of a women-led organization that provides tailored support for Indigenous women in remote communities, addressing needs not adequately met by government organizations or the private sector. This includes creating dedicated spaces that empower women and enhance their well-being. However, to achieve their goals, SEs need financial security, which can come

Anindilyakwa women connecting with Country during a harvesting trip. Photo: Giselle Cruzado Melendez

from the private sector or government institutions or both. The current competitive funding model for Bush Medijina affects its stability. This illustrates that political and financial support for Aboriginal SEs and economic development must be adapted to local contexts, and that support for Bush Medijina should evolve.

Anindilyakwa land management practices are believed to have low impacts on the environment by respecting traditional gender roles in harvesting, and by harvesting only when plants are abundant and only when *Country* is healthy. There is scope for co-research involving western knowledge on the ecological impacts of harvesting and ensuring its sustainability (e.g., Ens et al., 2012).

Although Bush Medijina operates under a strong cultural system of governance, where the maintenance of culture and the well-being of women are paramount, fostering appropriate collaboration and partnerships with non-Aboriginal allies has been instrumental in developing a value chain. These efforts foster the transfer of skills in both directions, creating new understandings around the integration of Indigenous knowledge and Western practices. This principle — and its context-specific implementation — is likely to typify successful Aboriginal SEs.

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This article is in memory of C.M., an inspiring young Anindilyakwa woman and true leader, who shared her love, culture and generous spirit with the author.

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A woman processing néré fruit *(Parkia biglobosia)*. Photo: Comlan René Yaovi

3.5

Contribution of non-timber forest products to women's lives, Burkina Faso

Dinderesso and Kou classified forests

Comlan René Yaovi, Fatimata Traoré, Tégawindé Jérôme Yaméogo, Aïchatou Nadia Christelle Dao and Mipro Hien

Non-timber forest products play a crucial role in improving the living conditions of women in rural areas of Burkina Faso, while contributing to food security and the household economy.

Introduction

Forests are of vital importance to Africa. More than two-thirds of Africa's population depend directly on forests for their livelihoods (CIFOR, 2005). The non-timber forest products (NTFPs) provided by these forests represent an important part of the economies of many countries around the world. For hundreds of millions of people, trees are an essential source of food, medicine, raw materials, and cash income.

In Africa, various societies have ancestral knowledge of the value of non-timber forest products (NTFPs), a knowledge particularly mastered by women. These products are an essential source of income for rural households; their harvesting and marketing have traditionally been carried out by women (Nduengisa et al., 2016) . NTFPs are attracting growing

interest because of their contribution to household economies, food security and conservation of biodiversity (Apema et al., 2010). Many researchers, policymakers and donors recognize the essential role of NTFPs in rural livelihoods, national economies and poverty reduction in several countries (Ouédraogo et al., 2013).

In Burkina Faso, poverty affects women more than men. According to a recent report of the National Institute of Statistics and Demography (INSD, 2024), the poverty rate is higher among households led by women than among those led by a man. Despite a growing attention to this issue, women remain marginalized in the management of forest resources.

Although the contribution of NTFPs to the well-being of populations and especially to food security is widely appreciated empirically, it is clear that it is rarely measured (Ba et al., 2006). More specifically, the impact of income from the commercialization of NTFPs on women's livelihoods is seldom studied. The evaluation of this income can shed a light on the real importance of forests for women and their households, and could improve their inclusion in the decision-making bodies for these forests.

In the context of Burkina Faso, the *Forest Code* (article 54) grants local populations the right of use over resources (dead wood, fruits, medicinal products) from classified forests. In Burkina Faso, classified forests are a category of protected area subject to a specific legal regime. According to Article 25 of the *Forestry Code*, the aim of forest classification is to protect forests of particular general interest, by restricting use rights and strictly regulating harvesting methods. Thus, although these forests are protected, they constitute an essential source of livelihood for local communities; in particular, from the exploitation of NTFPs.

The demand for these products keeps increasing, particularly in the cities of Ouagadougou and Bobo-Dioulasso, where their commercialization is growing. Bobo-Dioulasso constitutes an ideal study setting to assess the economic impact of NTFPs on women, because of its thriving market and its proximity to classified forests such as Dinderesso and Kou.

This article reports on a study by the authors that aimed to evaluate the economic contribution of NTFPs to women's standard of living. More precisely, it aimed to identify the NTFPs sold by local women, examine their value chain and assess their impact on living conditions.

Materials and methods

The study was carried out in November 2024 among women living near the classified forests of Kou and Dinderesso (FCDK), located in the Hauts-Bassin region of Burkina Faso (Figure 1). These two protected areas

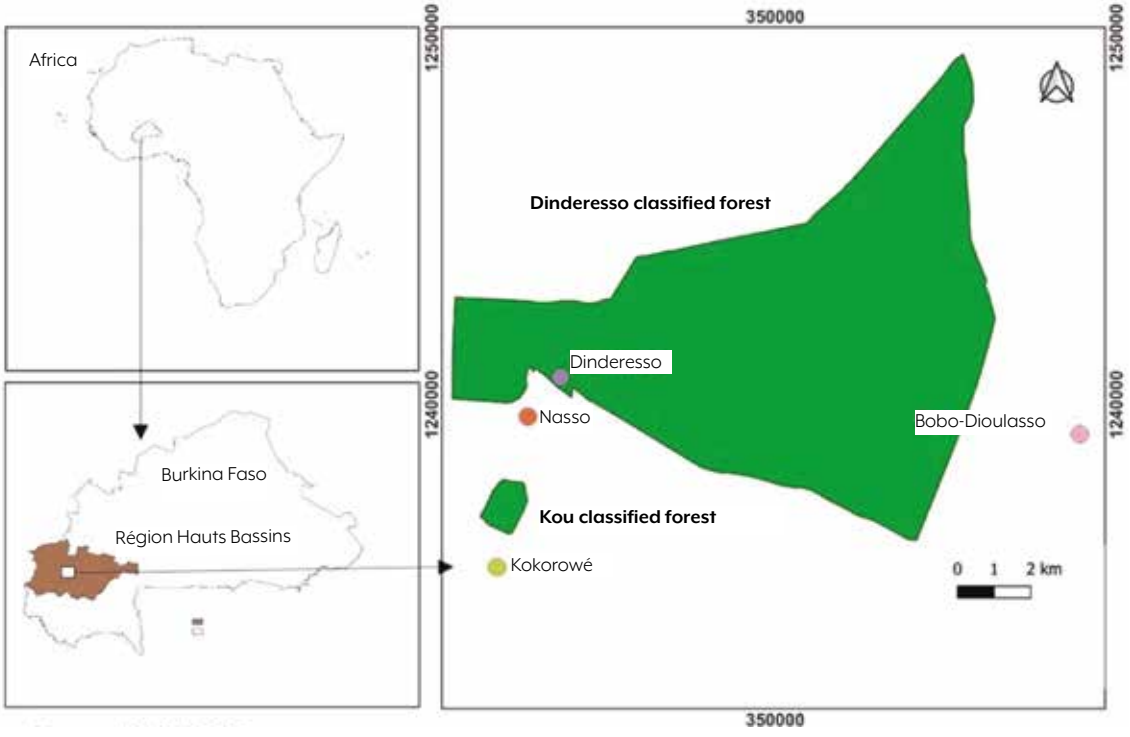

Figure 1. Geographical location of the surveyed localities
Source: BNDT, 2012; June 2023

are peri-urban forests located near Bobo-Dioulasso, the country's second largest city. They play an essential role in the production of NTFPs, which are sold in the riverside villages and, to a large extent, in the city.

An ethnobotanical survey was carried out through individual interviews in order to identify the socio-professional characteristics of women, the types of NTFPs they sell, the products' contribution to livelihoods as well as the women's sources of supply. The sampling followed a snowball approach, a non-probability sampling technique that gradually identified participants based on the first contacts established in each locality (Mwinga et al., 2022). In total, 100 women were interviewed, based on their willingness to answer the questions; they were distributed among the villages of Dinderesso (17 women), Nasso (18 women) and Kokorowé (23 women), and in Bobo-Dioulasso (42 women). The latter is the main market where the majority of women come to sell their products.

The data were analyzed by calculating the frequency of NTFP mentions and the earnings from them (yearly, monthly and daily).

Results and discussion

Non-timber forest products commercialized by women

The NTFPs sold by women living near the FCDK come from 16 species belonging to 15 genera and 13 families (Table 1 and photos, next page). *Fabaceae* and *Arecaceae* are the most represented families. These products include various derivatives such as leaves, fruits, nuts, seeds, oil, sap and flowers, as well as edible insects such as shea caterpillars (*Cirina butyrospermi*). Honey comes from several honey-producing plants. The study shows that women prefer plant-based NTFPs because of their accessibility and their high added value.

Table 1. Plant species mentioned and their derived NTFPs

Families	Plant species	French or local name	Derivative products*
Anacardiaceae	*Lannea microcarpa*	African grape or mpeku	Fruits
Apocynaceae	*Saba senegalensis*	*Liana* or *saba*	Fruits, juices
Arecaceae	*Borassus akeassi*	Borassus	Fruit, Borassus wine
	Elaeis guineensis	Palm tree	Seeds, oil
Bombacaceae	*Adansonia digitata*	Baobab	Leaves, monkey-bread (powder), oil
Caesalpiniaceae	*Detarium Microcarpum*	sweet *detar*	Fruits
Combretaceae	*Combretum micranthum*	*kinkeliba*	Leaf
Fabaceae	*Acacia macrostachia*	*zamnin*	Seed, oil
	Acacia nilotica	*baani* or *nepnep*	Pod, tannin
	Tamarindus indica	tamarind	Juice, fruit
Malvaceae	*Bombax costatum*	kapok tree	Flower
Meliaceae	*Azadirachta indica*	neem	Oil, soap
Mimosaceae	*Parkia biglobosa*	néré	Seed, fruit flour
Rhamnaceae	*zizyphus mauritiana*	*jujube*	Pulp or fruit
Sapotaceae	*Vitellaria paradoxa*	shea	Nut, butter, caterpillars, oil, soap, body milk, cream
Zygophyllaceae	*Balanites aegyptiaca*	balanites	Fruit, fruit juice, oil

*Note: Honey is also produced from melliferous plants, the list of which is not included in this table.

Some NTFPs sold by women, clockwise from top left: Shea nuts; fruits of *Saba senegalensis*; Baobab powder *(Adansonia digitata)*; fruits of néré *(Parkia biglobosa)*; Cosmetic derivatives of shea butter; fruits of *Balanites aegyptiaca*; and *soubala*, spice of néré *(Parkia biglobosa)*. Photos: Comlan René Yaovi

In total, 13 types of NTFPs are commercialized. The most common are néré seeds (*Parkia biglobosa*), mentioned by 32% of the women, shea kernels (*Vitellaria paradoxa*, 31%) and tamarind fruits (*Tamarindus indica*, 11%; see Figure 2). These NTFPs are transformed into diverse derivatives such as cosmetics, local fruit juices, organic pesticides such as neem oil (*Azadirachta indica)* and teas based on *Detarium microcarpum*. The strong presence in this list of néré seeds, transformed into *soumbala* (a local condiment), testifies to their importance in the local diet and cuisine (Coulibaly et al., 2020). According to the Agency for the Promotion of NTFPs (APFNL, 2013), these products also represent a significant source of income in the region.

Actors and value chain of NTFPs

Most of the NTFP sellers surveyed (60%) are from the Bobo ethnic group, which originates in the region, followed by the Mossi (17%) and the Senufo (8%). The majority of sellers are married (79%), the rest being widowed (15%) or single (6%). Their average age is 38, and 87% have not been to school. A total of 70% have been selling NTFPs for more than 15 years. At the organizational level, 92% of women operate in the informal sector. Only 2% are part of an association, and only 6% are registered as enterprises.

These results underline that the sale of NTFPs, although not very formal or structured, represents an essential economic activity for women, particularly married women and widows with family responsibilities. Its local roots and its longstanding practice by a majority of women testify to its crucial role in their economic resilience.

The lack of a formal organization certainly hinders market structuring and restricts access to more lucrative commercialization channels. This situation corroborates the work of Loubelo (2012) on the impact of NTFPs on the household economy in the Republic of Congo; there, only 13% of the respondents were affiliated with an organization. This highlights the informal nature of the NTFP sector and the lack of export opportunities for its various actors.

The value chain of NTFPs sold by women living near the FCDK has three main groups: those who harvest the products (51%); those who process them (36%); and those who resell them (13%). Harvesters gather the products directly in the forests (37%) or in the fields (16%). Some products, such as palm nuts and palm oil, are often imported from Ivory Coast.

Contribution of NTFPs to women's livelihoods

Profits from the sale of NTFPs vary depending on the products. In terms of cumulative value, the best-selling NTFPs are néré seeds, shea nuts and butter, and shea caterpillars (Table 2). Selling earns women an average of XAF 319,572 per year (approximately USD 518), with a minimum of XAF 2,500 (USD 4) and a maximum of XAF 8,540,000 (USD 13,833) per year. This works out to an average of XAF 26,631 per month (USD 43) or XAF 888 per day (USD 1.44).

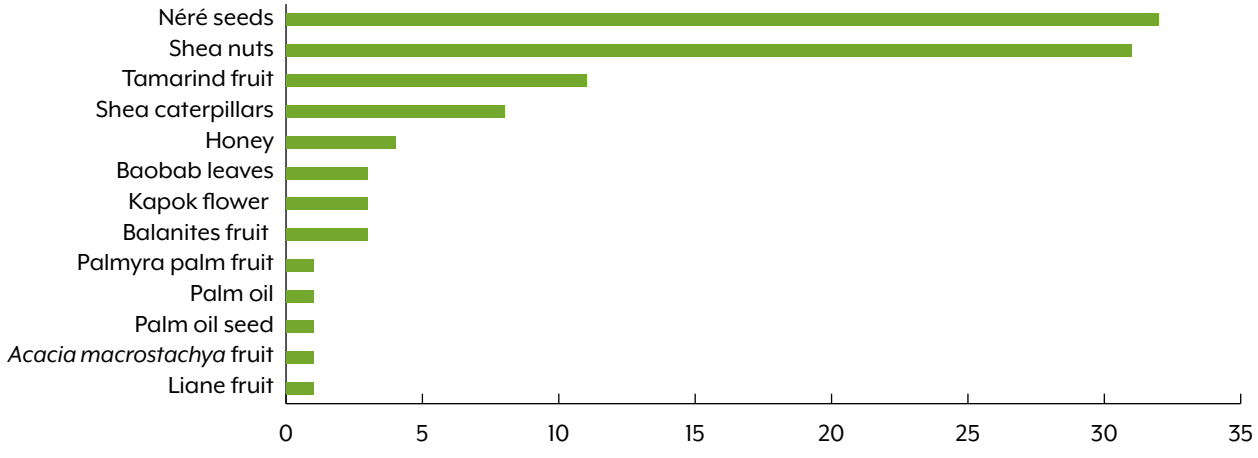

Figure 2. NTFPs commercialized by women interviewed (% of women who commercialized these NTFPs)

Table 2. Average annual and cumulative value of earnings (XAF), based on NTFPs, 2024

NTFP	Number of women	Cumulative annual earnings	Annual earnings per woman
Néré seed	37	25,886,900	699,646
Shea nut and butter	42	11,964,000	284,857
Shea caterpillar	9	10,329,400	1,147,711
Tamarind	12	4,825,800	402,150
Honey	6	4,051,000	675,167
Palm seed and oil	3	3,584,200	1,194,733
Monkey-bread	3	564,000	188,000
Acacia macrostachia seed	2	480,000	24,0000
Baobab leaf	3	478,200	159,400
Kapok tree flower	4	299,000	74,750
Balanites fruit	3	51,500	17,167

Thanks to this income, 35% of the women surveyed live above the national poverty line of XAF 20,650 per month, or USD 34 (INSD, 2024), and the international poverty line of XAF 1,045 per day or USD 1.90 per day set by the World Bank (2018). Lamien and Vognan (2001) have found that these products represent between 16% and 27% of women's income in the western area of the country. This study reveals that women processors generate more than double the income of harvesters and retailers (Table 3). This difference is explained by the added revenue that women earn by transforming the raw products.

What is the income earned by women used for?

The profits from the sale of NTFPs are used by the majority of women to take care of their family expenses (51%) or to cover their personal needs (Figure 3). According to them, this income is included in all kinds of expenses that are imposed on them. It should also be noted that some women help their husbands and others invest it in other income-generating activities. They can thus provide for the basic needs of their families and develop their financial autonomy to be less vulnerable.

The economic empowerment of these women through the sale of NTFPs not only allows them to meet the basic needs of their families and reduce the precarity of their households, but also to invest in education and entrepreneurship. This indirectly contributes to strengthening social stability and promoting the development of local human capital. Thus, women's inclusion in the forestry sector through the exploitation of NTFPs constitutes key leverage for inclusive and sustainable community growth.

Table 3. Distribution of earnings (XAF) in the NTFP value chain, 2024

Value chain link	Number of women *	Cumulative annual earnings*	Average earnings per woman
Harvesters	50	10,571,400	211,428
Transformers	35	17,769,600	507,703
Resellers	10	2,018,300	201,830

* This figure and the calculated earnings do not take into account the value of NTFPs sold by supermarkets.

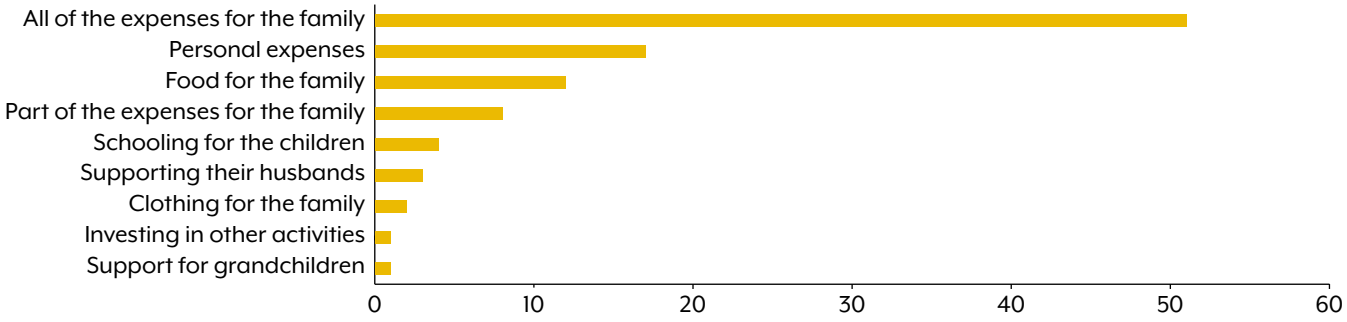

Figure 3. Use of the earnings generated through selling NTFPs by women

Difficulties faced by women

The majority of women (95%) described having to travel for longer distances to collect NTFPs, whereas previously these resources were more accessible. For 72% of them, the availability and accessibility of NTFPs are decreasing due to human activities (39% of the women), overexploitation of forest resources (26%), climate change (25%) and insecurity (11%). Women also face other difficulties: some products are becoming rare or inaccessible, harvesting and processing techniques remain rudimentary, the products are sometimes difficult to sell, harvesting conditions are difficult, conservation methods are limited, and the security situation is worrying.

Conclusion

This study highlights the importance of NTFPs in generating income for women around the Dinderesso and Kou classified forests. Despite their low level of education and the informality of their activities, these women contribute significantly to the well-being of their families and to the local economy through the commercialization of non-timber forest products.

The NTFP sector offers tremendous potential for women's empowerment and the fight against poverty in rural and urban areas. However, for this potential to be fully exploited, several challenges must be addressed. These women are already showing resilience and adaptation in the face of these challenges. With greater support, they could not only improve their living conditions, but also contribute more to the economic development of their communities and to the preservation of forest resources for future generations.

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Section 4

Women's empowerment and leadership

Previous page: Woman carrying a load of grass, India. Photo: Foundation for Ecological Security (FES)

Women taking part in a meeting on forest governance. Photo: Foundation for Ecological Security (FES)

4.1

Women's leadership in community-led forest governance in India

Apurwa Kachhap, Khanjan Ravani, Meenu Rana, Deepannita Misra, P.S. Madappa, Miranda Morgan and Marlène Elias

"Being a leader is not determined by one's gender; it is determined by their character and abilities."

Madhya Pradesh, man participating in focus group discussion

Introduction

Forests are critical to sustaining the lives and environments of rural communities in India, home to the largest forest-dependent population in the world, and globally. Rural women tend to be particularly reliant on forests for non-timber forest products (NTFPs) for fuelwood, food, fodder, medicine and more (Agarwal, 2009). For this reason, women are often the primary stewards of these common resources, relying on gender-specific knowledge of harvesting, processing, use and management. Yet women continue to face gender-based discrimination and marginalization in forest governance, and are less likely than men to take on meaningful leadership roles (Agarwal, 2010).

Recognizing that women having a voice in forest governance is a right unto itself and a pathway to sustainable forest management, state policies in

India have sought to redress these exclusions. Starting in the 1990s, formal affirmative action measures (quotas) were introduced to increase the representation of women and other historically marginalized groups on the executive committees of forest user groups in India's Joint Forest Management (JFM) programme – a co-management scheme aimed to foster the participation of forest-dependent people in the management of state-owned forest lands. Later, the 2006 *Forest Rights Act* (FRA), which provided forest dwellers with rights to land and other resources previously denied to them, stipulated that at least one-third of the members of the Community Forest Rights Management Committees (CFRMCs) elected to govern and manage resources must be women.

Despite such provisions, however, women's representation on and meaningful participation in the executive committees and general bodies of community forest management institutions in India is limited (Agarwal, 2009). Discriminatory gender norms and practices continue to place restrictions on women's mobility, prescribe a rigid division of labour in households, and shape the acceptability of women's participation in public discussions and decision-making, all of which result in women being marginalized in and excluded from leadership, and in the omission of their knowledge and priorities from management strategies and agendas (Gupte, 2004). This article explores how some women have managed to overcome these barriers to play active roles in forest governance and management, and what the outcomes of their leadership have been.

Context and methodology

In 2023, the authors conducted a qualitative study across seven communities in two Indian states with high forest cover (Odisha and Madhya Pradesh) to better understand women's effective participation and leadership in forest governance and their corollary outcomes.

Odisha is rich in mineral reserves and 39.3% of its geographical area is covered with forest (Forest Survey of India, 2023). More than 83% of the state's population lives in rural areas and is highly dependent on common pool resources (or commons), especially forests, inland water bodies and coastal waters. Of the state's total population, 22.9% is classified as Scheduled Tribes; this is an official designation by the Government of India for socio-economically marginalized groups of tribal descent.

Madhya Pradesh is rich in natural resources and forest cover, which reaches across 30.7% of the state (Forest Survey of India, 2023). The state has a sizeable tribal and rural population, who depend on the forests for their livelihoods and basic needs.

The methodology, described by Morgan et al. (2023), comprised 14 focus group discussions (FGDs) with separate groups of women (seven groups) and men (seven groups) to provide a detailed picture of gender-specific forest dependence, management practices and leadership roles. In addition, in-depth interviews were conducted with 21 women and seven men from diverse caste, tribal, age and socio-economic backgrounds in formal and informal leadership roles across the seven communities; these provide rich descriptions of their journeys as leaders, including in forest governance. Data were analyzed inductively using thematic coding to examine the key study questions, including the barriers to and enablers of women's leadership and positive environmental outcomes. The findings described in this article can inform future initiatives seeking to support women's leadership in forest governance.

Factors enabling women's leadership

Women who participated in the study detailed the deep-seated patriarchal norms and practices that limit their leadership and decision-making power. These include a gender division of labour that leaves women little time to engage in forest-related governance meetings, restrictions on their mobility, less formal education than their men counterparts, stigmas against women speaking in public and in front of elder men, and experiences of violence that reinforce women's compliance with these norms (e.g., Agarwal, 2010). Despite these well-known barriers, some women also described how they are able to take action and lead.

In interviews, women leaders spoke of multiple and overlapping factors (reinforced across different scales) that contributed to their becoming leaders and meaningfully engaging in decision-making. Several of these factors are explored below and depicted in Figure 1.

Support from family and community

In cases where women affirmed having an enabling context to take up a leadership role, support was often provided within the family. This support included spouses sharing household chores and care responsibilities for children and elders, which frees some of women's time, as well as family acceptance of women venturing out of the household. In this regard, a woman leader from Madhya Pradesh (MP) narrates how her family helped her become a *Sarpanch* (a president of the *Gram Panchayat,*

the rural local governance body): *"When I was contemplating whether or not to become a Sarpanch [head of the Gram Panchayat], my family encouraged me to go ahead with it. They assured me of their support in managing household responsibilities and gave me permission to engage in external activities."*

Among the women leaders interviewed, family support varied: a few found this support from the inception of their leadership journey, while others had to navigate an initial lack of support and help from family members until their families recognized the value of their work and then provided support.

Similarly, support from other community members played a vital role in enabling women to perform effectively in leadership roles. In the interviews and FGDs, men who supported women in leadership stated that more women should come forward and be given opportunities to steer the village towards development. One man who participated in a FGD participant in Madhya Pradesh acknowledged:

> ***"If someone has the skills and capabilities to work, they can become a leader. Girls should be educated, given permission to study outside, and not married off at a young age. They should also receive an equal share of property, and money should be deposited in their name in the bank each month."***
>
> FGD participant

Women's collectivization and mutual support

Women's collectives, such as self-help groups (SHGs) and *Mahila Sabhas* (local women's meetings to discuss and resolve women's issues, opportunities and government benefits and entitlements), have been instrumental in propelling women's successful participation in decision-making and leadership. These groups act as microcosms for leadership, providing platforms for women to speak up in familiar settings, and thereby enhancing their belief in themselves and their confidence in taking on future leadership roles. Encouragement from fellow women motivates and helps women leaders to continue practising their leadership skills.

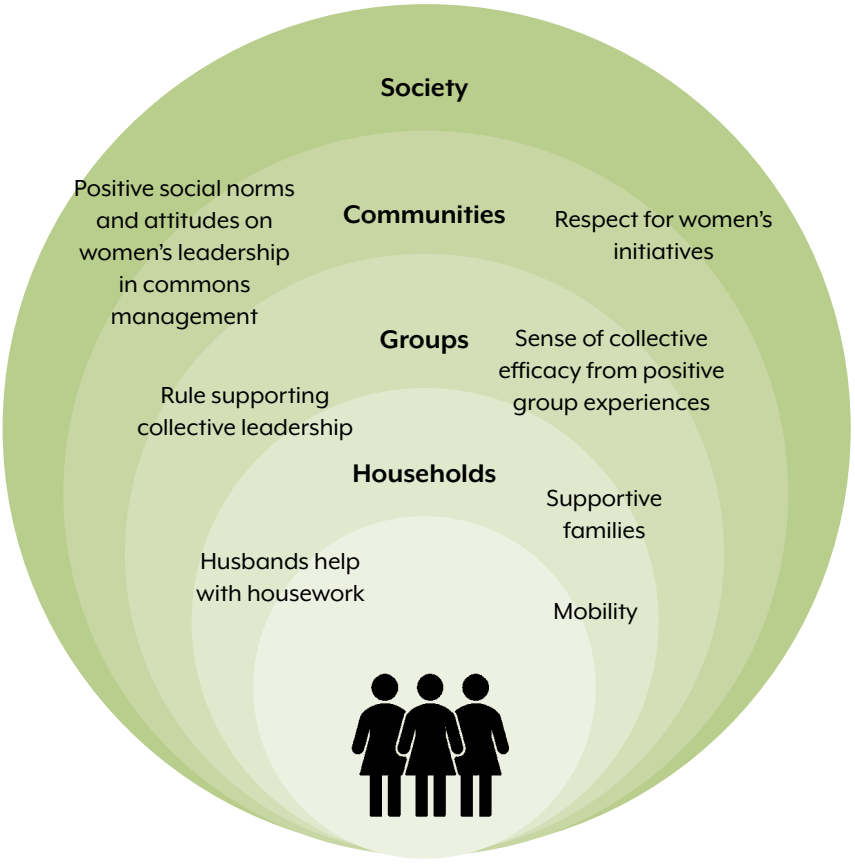

Figure 1. Enabling factors for women's leadership
Source: Miranda Morgan, Bioversity International

Interviews revealed that women often have ideas and solutions to share on critical local developmental issues, such as collectivizing and approaching the local administration for accessing basic amenities. However, they hesitate to voice them at meetings of the forest committee or other local institutions due to fear of backlash and lack of confidence. Forums led by self-help groups provide women with role models and a supportive context, allowing them to gradually build their confidence to speak up in meetings. These collectives are emerging as a crucial support system in rural areas, fostering empowerment and women's participation in forest governance, despite the significant barriers they face.

In a discussion on how community members collectively organize and establish rules for natural resource management, a woman leader from Odisha recounted the encouragement and support she received from fellow women: *"A [women's] producer group committee has been formed in my village, of which I am a member. I have been working with SHGs for 17 years and have attended meetings from the beginning. I also take women from my village with me to these meetings... All of them attend meetings now,*

whereas before, only a few would attend due to work. I informed all the women in my village that everyone should go together for forest work so that they could all find time to attend meetings."

Women receive support and encouragement from each other at these meetings, and women leaders inspire others to take on similar leadership roles. In this way, women who have traditionally been relegated to the household sphere surpass these boundaries and step into the public arena, dominated by men, to contribute to decisions on village development and common property resources, and on framing rules and forming committees.

Skills and exposure

Government and NGO programmes that provide training and capacity-building to these small women's collectives have had a positive impact on leadership opportunities for women. Interviews with women in Odisha and Madhya Pradesh reveal their interest in training and in visits that provide them with information and opportunities to apply new skills (maintaining record books, community mobilization and communication efforts) and knowledge pertaining to local governance, agriculture and natural resource governance.

A young woman from MP explains the positive impact of receiving training on sustainable harvesting.

> ***"Initially, I didn't have the courage to speak, but I was going for training, so after learning there, I started talking openly."***
>
> Young woman from Madhya Pradesh

Women report that through participation in training programmes led by grassroots organizations, they have emerged more confident, working in tandem with fellow women and senior administrative officials. This confidence has enabled them to participate more fully in discussions and decisions related to forest governance. In addition to skill building, engagement with NGOs and civil society has helped raise awareness of gender-based issues. A women leader in Odisha explains the influence of NGOs in addressing discriminatory gender norms: *"When the BIDA foundation [an NGO] came to our village, I was also educating women about the importance of attending meetings, even during their menstrual cycle. Women used to avoid discussions during this time because they were considered impure. They would also not speak in front of their husband's older brothers, and would wear a veil, and not stand before them. They would quietly accept the rules made*

Women and men at a training workshop. Photo: Foundation for Ecological Security

by men in the village. However, when they saw people from other villages carrying the ideas of the BIDA foundation, they also started learning from them. Together, we worked to take care of the village and the forest."

Outcomes of women's leadership

The study encouraged research participants to reflect on the ways in which women's leadership influences social and environmental outcomes. Although the study was not designed to measure or quantify the impact of women's leadership on these various areas (on its own or relative to men's leadership), many participants did share their perceptions of how women's leadership has contributed to improved forest governance and management, and has enhanced the voice and agency of women and their livelihoods.

Improved forest governance and management

Community mobilization and the collective framing of rules and regulations, including sanctions and provision of access and control, are important aspects of forest governance. As environmental and forest stewards, women leaders have initiated several interventions and ensured the implementation of and adherence to these rules. At the community level, this includes appointing a forest guard (from within the community) and convening meetings at regular intervals to discuss issues regarding forest management. In Odisha, a woman who participated in an FGD provides an example of how women took the lead in formulating rules.

> ***"Women members had collectively appointed a guard to protect the forest, and they took care of its conservation. They have established rules for the forest, such as bringing supplies from the forest only once a week..."***
>
> FGD participant

Women in the study sites have played a key role in restoration activities. For example, women's groups have participated in and mobilized community members in planting native tree species. Previously, women (who have socially ascribed responsibilities for NTFP collection) were travelling to neighbouring village forest patches to collect forest products, including NTFPs, when the patches they relied on were degraded. This led to inter-village conflicts and affected the economic and social fabric of the community. Since then, restoration activities and the establishment of rules, as well as forest patrols, have resulted in an increase in tree density and improved access to NTFPs, with benefits for the livelihoods and incomes of forest-dependent families.

In Odisha, men specifically acknowledged women's contribution. For example, one man who participated in an FGD recounted: *"Earlier, there were no trees, so we had to go seven kilometres away to another village forest to collect wood and NTFPs. As a result, people from neighbouring villages used to accuse us of theft, catch us while cutting wood, beat us, insult us, and sometimes even impose fines on us, and the income from NTFPs was minimal for women."* He elaborated.

> ***"That is why the women themselves initiated tree planting in the forest, and they continue to do so and have collectively appointed a guard to protect the forest, and have taken care of its conservation."***
>
> FGD participant

Women in Madhya Pradesh also shared how women rallied to protect their forest: *"We have done a lot of work related to forests. There was a plan to cut down the trees in the forest on which we depend, including the valuable trees. We stopped the cutting of those trees and instead planted* Sagwan *[teak] trees there. We also saved another forest near our village from being cut down. We explained to them [the forest administration] that our livelihood depends on these trees. These trees are very old, and it takes 100 to 150 years for them to grow. We told them that they cannot cut down these trees."*

Improved livelihoods for women

Through *Mahila Sabha* meetings, women try to collectively resolve social issues and to sensitize men in the communities about women's participation in these leadership forums. Along with undertaking conservation activities, women have also reported economic benefits. Women participants expressed how collective actions have enabled them to take up forest-related economic opportunities, which previously benefitted only men.

This was the case, for example, with revenues from tendu leaf (from the *Diospyros melanoxyion* tree), one of the most valuable sources of revenue for the communities in the study. While women have primarily done the collection and sorting, they could not benefit from tendu leaf

Women engaging in collection and processing of tendu leaves. Photo: Foundation for Ecological Security

revenues because the trading cards (government permits for the trade in tendu) were issued only in men's names. But through repeated discussions and collective efforts, women in Madhya Pradesh were successful in having the cards registered in their own names, not just their husband's. A woman leader from MP explained how the women collectively work with and market the tendu leaf and now receive direct monetary benefits from it.

> ***"We have made the tendu leaf cards in the name of women now. Earlier, the cards were in the name of the men in our households, and they would withdraw the money. But now, women can withdraw the money."***
>
> Woman leader, Madhya Pradesh

These economic benefits have been crucial in increasing women's economic power, which they say has helped to enhance their confidence and encouraged more participation in community decision-making.

Conclusion

This article demonstrates how women in two states in India exhibited leadership in forest governance and in forest-dependent communities. Women's and men's narratives illustrate the factors that support women to lead, and show how this can help to sustainably manage and conserve forests. They describe how family support encourages women to feel more confident in stepping out and assuming leadership roles. Government and NGO support for women's formal and informal groups (SHGs, *Mahila Sabhas*, etc.), as well as provision of training and capacity strengthening, plays a crucial role in strengthening women's leadership.

Although CFRMCs and existing laws mandate the compulsory representation of women in forest governance, ensuring their meaningful participation requires multipronged approaches to address barriers across different levels. For example, women from the communities emphasized the need for both state policy and community initiatives to address structural barriers to their leadership in forest governance; in particular, the discriminatory social norms and behaviours that prevent women from exercising meaningful leadership roles. Also important are community-level efforts to support women in collectives and to engage men as allies. Overall, a multifaceted strategy will be vital for advancing women's meaningful and effective leadership in forest governance.

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4.2

Xerente women volunteer firefighters participate in fire suppression training. Photo: Pedro Paulo Xerente

Breaking barriers in the Brazilian Amazon

Indigenous women's roles in climate action and fire management

Ana Luiza Violato Espada, Mariana Senra de Oliveira, Maíz d'Assumpção, Pedro Paulo Xerente, Dinalice Xerente and Ana Shelley Xerente

"Capacity building and awareness of gender-based norms in integrated fire management can lead women to acquire new skills and break barriers to become effective agents in climate action."

Ana Luiza Violato Espada

Introduction

Wildfires — uncontrolled fires that burn forests, grasslands, savannas and other ecosystems — are growing in intensity due to anthropogenic climate change, land-use change, and poor land and forest management. Wildfires in some ecosystems are beneficial and have occurred for millions of years. However, wildfires are burning longer and hotter in many places worldwide, including environments where they previously did not occur (UNEP, 2022). For example, Brazilian tropical rainforests are sensitive to fire, meaning that fire is not natural to their ecological succession, but wildfires are becoming common in these ecosystems (Barlow et al., 2019). Multiple strategies, such as Integrated Fire Management (IFM), are required to address extreme fire conditions. IFM consists of planning and prevention, preparedness, response and recovery efforts that are integrated with the sociocultural

needs of local communities and the fire ecology of the ecosystems being protected. IFM also encompasses fire prevention strategies such as environmental and degraded land restoration (UNEP, 2022).

Specific efforts to include women and Indigenous communities are seen as crucial. Indigenous knowledge can bring insights to the use of fire in wildland fire management, and women commonly face discrimination in the hypermasculine culture of wildfire management (Association for Fire Ecology, 2016). Academics and practitioners acknowledge that women can play a crucial part in climate action solutions. Women are one of the most affected social groups when it comes to climate change and "women interact with, use, understand and value the environment differently than men" (James et al., 2021, p. 1). Women can be active and effective agents and promoters of adaptation and mitigation, due to this different perspective on conservation efforts (James et al., 2021).

Women still face inequalities in access to the financial and material resources, training, information and technology that are part of IFM. In addition to these challenges, women face discrimination based on gendered norms that prevent them from attaining leadership positions in IFM strategies. Capacity building and awareness of these gender-based norms can lead to more inclusive approaches. This article reports on the Xerente Indigenous women who work as volunteer firefighters in Brazil. Their case demonstrates how fire management training and the acquisition of new technical skills led these women to carry out fire suppression, and to go beyond this to promote both environmental education and restoration within protected areas such as Indigenous lands in Brazil.

Study context

The authors conducted six in-depth interviews to gather information related to: a) motivations for and main challenges to creating the volunteer fire brigade; b) strategies established to provide institutional and technical resources that support the women-led initiative; c) main activities developed; and d) perspectives of the women firefighters. Three of the authors used participant observation to cross-check and note women's participation and the collective capabilities of the Indigenous women firefighters. Participant observation was conducted during the fire brigade training that took place from August 18 to 20, 2021, in the Xerente Indigenous Land, in Tocantins.

The state of Tocantins, located in the Brazilian Amazon region, has nine wildland fire brigades composed of 208 Indigenous people operating in five indigenous lands. These indigenous lands comprise almost 2,000,000

View of the Xerente Indigenous Land. Photo: André Dib

hectares, where around 15,000 Indigenous people have customary and legal rights to live and to use natural resources for their livelihoods. Among these territories of traditional use, the Xerente people live in two areas: the Xerente and Funil Indigenous Lands (Figure 1).

With 168,000 and 16,000 hectares respectively, the Xerente and Funil indigenous lands are located in a predominant savannah ecosystem where fire is a natural component that renews and grows vegetation. However, wildfire threats are becoming more common in the Xerente areas. Due to the former fire suppression policy and climate change, the Xerente people are experiencing heightened wildfire risks during the dry season (July–October), when temperatures can reach 38°C to 41°C. Besides the wildfires' effects on the Xerente's homes, they have also harmed the production of flowers and fruits, jeopardizing the collection of native fruits and native honey, which provide food for Indigenous people and wildlife.

Since 2013, the National Center for Wildfire Prevention and Suppression (Prevfogo), has been training and hiring Indigenous people to become firefighters. Prevfogo is a specialized part of the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama), which is responsible for monitoring, preventing and controlling forest fires. Through a technical cooperation agreement between Ibama and the National Indigenous Foundation (FUNAI), Prevfogo/Ibama trains and hires Indigenous people to become firefighters on their own lands. The agreement's aims are twofold: 1) to implement Indigenous federal wildland fire brigades in indigenous land; and 2) to carry out integrated fire management. The programme also seeks to engage Indigenous people as short-term firefighters hired by the federal government. Collaboratively, Prevfogo and its partner organizations provide technical assistance such as training and financial resources for equipment to prevent and combat wildfires.

Besides the Indigenous people who are hired for fire brigades, Indigenous volunteer fire brigades can also receive training from Prevfogo/Ibama. Up to 2021, the Xerente and Funil indigenous lands had a single hired fire brigade, made up of 22 Indigenous men. Since the formation of the brigade, men have had more opportunities than women to participate. It was common for only men to participate in the tests to join the brigade, as the gendered-base assumption was that women did not have the interest in or strength for firefighting work.

Xerente Indigenous women's volunteer fire brigade

Motivations and main challenges

In 2021, the Xerente women created the first women-only Indigenous volunteer fire brigade in Brazil, a milestone for all Indigenous women in the country. The main motivation for the Xerente women was that, in 2015, for the first time, a

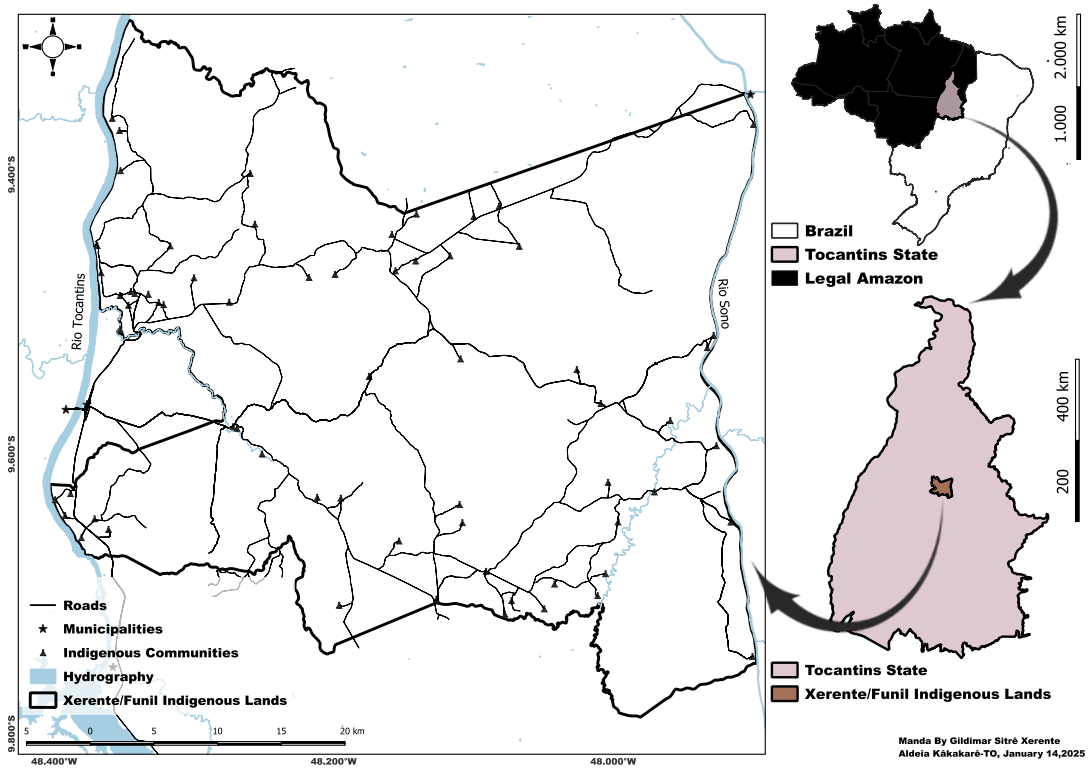

Figure 1. Location of the Xerente and Funil Indigenous Lands in Tocantins, Brazil
Source: Gildimar Xerente

Xerente women volunteer firefighters train in prescribed fire practices. Photo: Pedro Paulo Xerente

woman, V.S. Xerente, enrolled in the Prevfogo/IBAMA hiring process to be part of the contracted fire brigade. Ms. Xerente felt the need for women to participate in the hiring process and she decided to be a role model. Her initiative stood out, considering that it was common at the time for the Xerente women to be on the sidelines of the hiring process, watching the physical fitness tests and cheering for their men relatives. According to one Xerente woman: *"She was one of the inspirations for us, to start seeing the capability that we have and things we can and should do. When we were in the fire brigade course, [she] was mentioned several times by the female firefighters. I used to say: I'm wary of talking, because for me she's already an inspiration for a lot of things, and I'm still too young to talk; she's practically an old woman, I used to joke like that."*

The Xerente women knew that it was not likely that this woman would pass the physical tests. First, she had some health issues, and second, the interviewees perceived that the men competing with her were physically stronger and more agile than her. Even so, the Xerente women were inspired by her ambition, cheering for this woman who became their role model.

There were two physical tests for the hiring process. The first was the Physical Aptitude Test (TAF), which requires a person to walk for 2,400 metres carrying a backpack pump filled with water, weighing approximately 24 kg, in 25 minutes for men and 30 minutes for women. The second test, Skills and Management of Agricultural Tools (THUFA), consists of a person cutting grass and raking an area of three metres by five metres in 20 minutes for men and 24 minutes for women. The applicant needs to completely clear the vegetation, according to the practice of clearing down to the mineral soil.

"It was kind of an unprecedented thing in the history of the [Xerente] indigenous women. When she got back from the physical tests, she fainted; she didn't pass the TAF and THUFA."

A Xerente woman

To become firefighters, the Xerente women faced discrimination from relatives who did not approve of women participating in a fire brigade, as it was viewed as a workplace only for men. In fact, some women were

discouraged from participating altogether. As one Xerente woman said:

> ***"We have a huge barrier to deal with: sexism. Some people think they shouldn't count on women because we are not capable, but they are wrong. We can run a house, take care of our kids, and do five or six things at the same time. Now they believe in us. They've given us visibility and recognition."***
>
> A Xerente woman

Strategies to support the initiative

The Xerente women pursued the idea of becoming firefighters by having a man who was a firefighter as an ally, who was the president of the Association of Xerente Indigenous Firefighters (ABIX). Together with him, they created partnerships with technical organizations to provide training to 29 women. They participated in a three-day training session for a women-only fire brigade. The training (see photos, page 124 and 127) was held between August 18 and 20, 2021, by Prevfogo/Ibama, in partnership with the U.S. Forest Service (USFS) and ABIX, and with support from the U.S. Agency for International Development (USAID).

Working collaboratively with partner organizations, who assisted them with technical expertise and institutional visibility, the Xerente women were able to develop more partnerships; for instance with the private sector, to access fire equipment.

Main activities

After the Xerente women received training to become volunteer firefighters, four of them continued capacity building in IFM through a sequence of virtual courses offered by partner organizations. These women participated in five different virtual courses, amounting to 74 hours total.

The head of the Xerente women firefighters has participated in meetings and training outside her indigenous land. For instance, in 2022 she participated in an environmental education course on preventing

Xerente women working with plant seedlings. Photo: André Dib

Xerente women firefighters working with plant seedlings. Photo: Andressa Anholete

wildfires during the critical fire season. The course included topics related to climate change and its impacts at the global and local scales. It also included mitigation and adaptation actions regarding wildfires, flooding and dry weather. The course prepared her to understand the global climate change scenario, and how people can deal with it at the local scale. She also worked closely with ABIX and the fire brigade on an exchange for 20 Gavião Indigenous women from Maranhão state. They visited the Xerente women to share experiences as firefighters, and the Xerente women discussed their strategies for overcoming gender discrimination and other barriers. These included making alliances with the men firefighters and gaining support from them to implement IFM. One example was the environmental education meetings with community leaders to explain that fire could be used, but only with appropriate techniques during the critical fire season.

The Xerente women also created communication strategies within the indigenous lands to bring together women firefighters from villages that are geographically distant from each other — the Xerente Indigenous Land has 90 villages and Funil has seven. They created a WhatsApp group that included 31 women from various communities. Through this group, they created a social bond whereby the women can share concerns about relatives not agreeing with their participation, and can communicate their professional aims, such as continued education to further their knowledge and enrich their curriculum. They also encourage each other to participate in free courses with certificates available on the internet. As the women's group strengthened their work relationships, they started to plan activities at the local scale to raise awareness about the critical fire season. For instance, they planned to visit each community within the two indigenous lands to develop an annual calendar. The calendar identifies the periods when families usually use fire to prepare the land for their crops. Knowing this helped the firefighters to be alert and support the communities with adequate equipment to prevent uncontrolled fires.

The Xerente women conducted environmental education in three ways: 1) they listened to the elders about the local way to use fire; 2) they talked about climate change; and 3) they reflected on new ways to integrate both ancient and technical knowledge in IFM. These women helped define the role of fire brigades within their territories: the hired fire brigade works predominantly on fire suppression, while the women-only volunteer brigade works on fire prevention. The women's work includes prescribed burning, degraded land restoration, and visits to local communities to raise awareness of the critical fire season.

The Xerente women were also part of efforts to restore degraded land in areas affected by extreme fire. They received training in seedling production and nursery management, focusing on seedlings from locally collected seeds. Plant species included those that grew naturally in their lands; for instance, *Mauritia flexuosa,* which is found near watercourses. The women were responsible for collecting seeds from the natural vegetation in their territories, and for preparing plants and planting seedlings. To date, they have restored approximately two hectares to protect a waterhole that is a water source for their homes and local wildlife. They also invite local schools in order to involve children and youth. The Xerente women were not paid to implement the restoration activities, but they received logistical support from external partner organizations (e.g., government agencies) to monitor the degraded areas.

Xerente women firefighters carry out fire management activities. Photo: Andressa Anholete

Other activities

The Xerente women continued to develop their activities as a volunteer group. However, they also sought economic support for their role. Due to the technical skills they acquired — and their leadership, which was acknowledged by partner organizations, particularly Prevfogo/Ibama — in 2024 and 2025 eight women were hired by the federal agency to work as firefighters on prescribed burning as part of fire prevention strategies. In addition, the Xerente women sought to continue being an example to other women firefighters. They supported the creation of a regional network of Indigenous women firefighters. Within this network, three more women-only indigenous brigades were created, one in each of three indigenous lands in Tocantins and Maranhão states. In November 2023, the Xerente brigade met with the three new brigades in a regional meeting to reflect on the main challenges and strategies for women who work as firefighters.

Discussion

This pioneering initiative in the Brazilian context could be an example for scaling in different contexts around the world to break barriers in gender roles in workplaces dominated by men. First, the Xerente women overcame the Xerente people's perspective that only men were able to work in fire management; to do so, they created a women-only fire brigade. Second, these women improved their technical skills with training in integrated fire management. Third, they created alliances with the men firefighters, showing that men and women could work together, instead of competing, on common goals such as preventing wildfire in their territories.

Gender discrimination is typically underreported in wildland fire management workplaces; the Xerente women found venues to deal with this challenge in their culturally patriarchal society. Although reporting gender discrimination is important in order to change the attitude toward women working as firefighters, the Xerente women avoided direct confrontation with members of their villages and families. Instead, they organized themselves, at first with help from local allies (such as ABIX) and later with external partners (such as Prevfogo/Ibama and the U.S. Forest Service), which provided training and continued education on integrated fire management. Working closely with men allies, the Xerente women also secured fire management tools and equipment to

perform their tasks. Their strategies have the potential to motivate women in other men-dominant cultures to shift their roles in climate action.

The Xerente women who work as volunteer firefighters can serve as role models for other Indigenous women, helping them to act on climate change mitigation and adaptation. Indeed, some representatives of the Xerente women have been disseminating their message and providing lessons learned to other women in the Brazilian Amazon.

The Xerente Indigenous women promoted awareness within Brazilian federal agencies and partner organizations regarding gender-based discrimination in integrated fire management approaches nationwide. This case shows how intentionally including women in technical training can break barriers and provide a more inclusive workplace for climate change action.

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4.3

Wiga at a community water source.
Westhi Wigaringtyas

One woman's journey to empower women in forestry, Java, Indonesia

Sorelle Henricus and Westhi Wigaringtyas

"Change starts with breaking old beliefs and giving everyone a seat at the table, regardless of gender."

Westhi Wigaringtyas

Introduction

In Indonesia, in the heart of Kebumen Regency, Central Java, Westhi Wigaringtyas — known as Wiga within her community — is quietly revolutionizing community forestry in a region where women's leadership has long been sidelined. Wiga balances motherhood with her role as a forestry manager at Kostajasa Community Forest, challenging entrenched gender norms. Her journey reflects a broader struggle: women in social forestry households average just 6.6 years of education compared to men's 8.1 years, limiting their participation in decision-making roles (Rawluk et al., 2024).

Wiga's path to becoming a dedicated forestry professional was far from straightforward. It's a story of resilience, commitment and an unwavering belief in the power of inclusivity — a story that begins not in a boardroom but in the heart of the forest itself. Kostajasa Community Forest is situated in a region where traditional gender roles have historically limited women's participation in forestry. Forestry activities reflect the deeply embedded patrilineal norms of Javanese culture.

From 2011 to 2018, Wiga faced considerable resistance as she tirelessly championed the importance of women's involvement in forestry. She understood that women's perspectives were crucial for the sustainable management of forest resources, yet their voices were often overlooked in decision-making processes (Arthur and Eggerts, 2022). Despite these challenges, Wiga persisted, driven by the belief that a more inclusive approach would lead to better outcomes for both the forest and the community.

A turning point came in 2018 when a change in management of the Kostajasa forest collective brought a new vision that validated Wiga's perspective and embraced her commitment to inclusivity by including more women in decision-making roles. This shift opened doors for women to actively participate in decision-making processes and take on more prominent roles in field activities. The newfound inclusivity not only empowered women within the community, but also brought fresh perspectives to the management of Kostajasa's forests, fostering a more equitable and effective approach to sustainable forestry.

Wiga's story aligns with Indonesia's broader social forestry initiative, which emphasizes the importance of community involvement in forest management (ECOSOC, 2022). By promoting gender equality and women's empowerment, such initiatives can accelerate sustainable development and climate resilience (Arthur and Eggerts, 2022). Through her persistence and advocacy, Wiga has demonstrated that women can excel in leadership roles in forest management, contributing to both ecological conservation and economic growth.

This article shares Wiga's story through a series of personal interviews contextualized by studies on the role of gender in sustainable forestry in Indonesia. It gives a glimpse of how the persistence and resilience of a single woman can make an impact.

Certified forestry in Kostajasa

The Kostajasa Community Forest, located in Kebumen Regency, exemplifies the integration of sustainable forest management and community empowerment. Spanning approximately 2,500 hectares, this certified forest operates under principles that ensure that environmental, social and economic benefits are equitably shared among its members. Its success highlights the balance between ecological conservation and economic development.

Kebumen's hilly terrain and fertile soil make it ideal for mixed-use forests, with management blending native species conservation with productive forestry practices. The forest provides critical ecosystem services, including watershed protection, soil stabilization and biodiversity

Westhi Wigaringtyas, or "Wiga." Photo: Westhi Wigaringtyas

preservation. Its location within a tropical climate zone contributes to its rich floral and faunal diversity, making it a vital resource for the local community and a haven for various wildlife species.

Kostajasa operates as a community-based cooperative, involving 1,200 member households organized into 15 forest farmer groups (KTHs). Each KTH represents a specific village, creating a decentralized yet cohesive structure that allows for localized decision-making and management.

The cooperative's governance framework is designed to be inclusive and participatory, ensuring that all members, regardless of gender or socio-economic status, have a voice in the management process. These are some of the key components of the governance structure:

- General Assembly: The highest decision-making body, composed of representatives from all KTHs, meets annually to approve strategic plans and policies.
- Board of Management: Elected by the General Assembly, this board oversees daily operations, ensures compliance with certification standards, and coordinates activities across the forest.
- Technical committees: Focused on specific issues such as sustainable forest management, community development and gender inclusivity, these committees provide expert guidance and implement targeted programmes.
- Monitoring and evaluation teams: Composed of trained members, these teams ensure adherence to sustainable management practices and track the forest's ecological health and socio-economic impacts.

In 2025 Kostajasa achieved sustainable forest management certification through the Indonesian Forestry Certification Cooperation (IFCC), endorsed by the Programme for the Endorsement of Forest Certification (PEFC). This certification ensures that the forest is managed in line with globally recognized environmental, social and economic standards.

With forest certification in place, the wood and forest products produced can be sold internationally as originating from a traceable sustainable source. The certification has unlocked new opportunities for selling to environmentally conscious buyers. For Wiga and the community, this means that their sustainable practices translate into tangible economic benefits. Products from Kostajasa include high-quality teak, mahogany and other hardwoods, which are sold domestically and internationally.

Wiga's journey

Wiga joined Kostajasa in 2011, motivated by a commitment to sustainable forest management. Her hands-on approach encompasses monitoring and operational activities that align with the Indonesian Forest Certification Cooperation (IFCC).

The focus of Wiga's work ranges from monitoring the health of local resources such as water, trees and native wildlife to maintaining meticulous records of timber from felling to transportation, issuing legal documents that comply with PEFC's Chain of Custody standards.

Wiga is a central point of communication within the community, achieving the delicate balance between safeguarding natural resources so they can regenerate, and enabling commercial activity that provides livelihoods for the community. Wiga conducts regular assessments to ensure the health of local springs and water resources and detect any contamination from forestry operations. Local water sources provide nourishment to the natural ecosystem while supporting the domestic and commercial needs of local communities, and Wiga's careful monitoring safeguards the communities. This means limiting activities that are a drain on water sources during seasons of water scarcity. When local families and businesses are made aware of the availability and quality of water in their area they can come together to make better decisions around scarce resources.

In addition to safeguarding water resources, Wiga also champions biodiversity conservation. By identifying and protecting the habitats of native wildlife, she implements strategies that minimize disturbances and promote natural regeneration. She prioritizes practices such as selective logging, which ensures that only mature trees are harvested, reducing damage to surrounding vegetation and to soil health. To further protect native wildlife, Wiga supports the establishment of buffer zones around critical habitats, limiting human activity in these sensitive areas. Additionally, she emphasizes the importance of replanting degraded areas with native tree species to restore ecosystems and support biodiversity.

Documentation and traceability are paramount in Wiga's work. By ensuring compliance with selective logging and certification standards, her efforts minimize habitat fragmentation and soil degradation — critical factors in maintaining biodiversity and preventing deforestation-

A community gathering. Photo: Westhi Wigaringtyas

related disasters such as landslides. This way of managing forest activity means a more stable outlook in the long term for the community, which depends heavily on forestry.

Beyond operational duties, Wiga is dedicated to community engagement and education on sustainable forestry practices. Recognizing that knowledge dissemination is crucial for her community's long-term sustainability, she conducts regular talks, workshops and campaigns, which she integrates into local events. Wiga places particular emphasis on empowering women in forest farmer groups (KTHs), acknowledging their significant domestic responsibilities and increasing their involvement in commercial forestry. As a mother herself, Wiga exemplifies how, with her husband's support at home, she can contribute to the family income.

The impact of women's inclusion

Including women in forestry brings transformative benefits. The United Nations Economic and Social Council (ECOSOC) emphasizes the critical role of gender equality and women's inclusion in effective climate mitigation, particularly in forestry and land use (ECOSOC, 2022). Approximately 3.2 billion people worldwide are affected by land degradation, with disproportionate impacts on rural populations and smallholder farmers — particularly women (ECOSOC, 2022). This environmental crisis stems primarily from the unchecked expansion of industrial agriculture, unsustainable grazing practices and poorly managed forestry operations, which prioritize short-term productivity over long-term ecological health (ECOSOC, 2022).

The landscape challenges identified by ECOSOC align closely with the local conditions confronted by Kostajasa. Wiga's advocacy for sustainable forest management directly addresses these issues by promoting practices that balance ecological health with economic benefits. Through her leadership, Kostajasa has implemented capacity-building programmes, such as compost-making and diversified income-generation activities, which mitigate land degradation while empowering women to become active stewards of the forest.

The United Nations Development Programme reports that advancing women's empowerment and ensuring gender-inclusive policies in forestry are vital not only for speeding up sustainable development and climate progress, but also for driving economic efficiency (Arthur and Eggerts, 2022). Creating contexts where women feel safe to participate equally and effectively in forest-related activities is essential (Arthur and Eggerts, 2022). This approach allows women to shape and inform interventions, leading to outcomes that are more

responsive to gender needs and to the forest environment (Arthur and Eggerts, 2022). Wiga's efforts at Kostajasa directly exemplify these principles by fostering safe spaces for women's participation in forestry. She has worked to establish platforms where women, such as those in the forest farmer groups, can voice their concerns and contribute to decision-making processes. These practical initiatives align with global recommendations that emphasize the need for gender-responsive approaches to ensure meaningful participation and tangible outcomes.

Kostajasa's policies have evolved to prioritize women's active involvement at multiple levels, including representation on KTHs and management committees. The inclusion of women in forestry activities at Kostajasa has led to increased opportunities and active participation in both family-level farmland management and broader community forest management initiatives. Women are now playing a more significant role in sustainable practices, particularly through targeted capacity-building programmes. Starting later in 2025, as part of the Community Forestry Business Work Plan (RKPHR), Kostajasa will implement training sessions focused on compost-making for women members. These sessions aim to enhance technical knowledge and provide practical skills that women can apply to improve soil fertility and agricultural productivity, benefiting both household farming and community forestry efforts.

The World Bank's report, *Fostering gender-transformative change in sustainable forest management*, found that women's unique perspectives bring innovative solutions to resource management, enhancing sustainability (Canpolat et al., 2022). Women often prioritize long-term ecological health, supporting the adoption of sustainable forestry practices. That report's observation, from case studies in Ghana, Peru and other parts of Indonesia, is reflected in Kostajasa's programmes, where women's involvement has enhanced biodiversity conservation and sustainable land-use practices. For instance, Wiga has led initiatives to ensure that selective logging and traceability processes are adhered to, reducing ecological impact and preserving forest integrity —a vision that aligns with international calls for inclusive environmental stewardship (Canpolat et al., 2022). Women's involvement is crucial for maintaining biodiversity and the integrity of forest ecosystems, which are essential for future generations. Economically, women's contributions lead to improved family incomes and greater financial stability (Canpolat et al., 2022).

To further support women's economic empowerment, Kostajasa has introduced skills-training programmes that utilize locally available resources, such as banana tree trunks for rope-making and coconut fronds for crafting plates. These initiatives not only diversify household income streams but also reduce reliance on unsustainable forest practices by promoting alternative livelihoods.

Forestry monitoring activities in Kostajasa. Photo: Westhi Wigaringtyas

Conducting community capacity building. Photo: Westhi Wigaringtyas

A recent study of Indonesia's social forestry permits (Rawluk et al., 2024) shows that women remain underrepresented in forest management bodies, particularly in community forests, despite efforts to boost their presence. Researchers found that women are more engaged in social forestry business groups. For example, Kelompok Usaha Perhutanan Sosial (KUPS) groups, which focus on the processing and sale of forest products, showed 46.3% participation by women, while their participation in forest management bodies was 13.8% for community forests and 19.1% for village forests (Rawluk et al., 2024). This shows that a disproportionate exclusion of women from decisions about their forests is not exclusive to Kostajasa.

Socially, increased participation by women fosters respect and recognition for their leadership, promoting a collaborative community spirit in decision-making processes (Arthur and Eggerts, 2022). Wiga's story is one example of how women's equitable involvement in leadership roles and decision-making processes fosters greater support for gender-responsive approaches in forestry. An internal 2023 social impact study (Kostajasa, 2023) revealed significant progress in gender inclusivity within Kostajasa's operations, including joint decision-making on land management and increased women's participation in training sessions and forest management activities (see Table 1).

Integrating women's voices enhances community representation in broader forestry initiatives. Their insights contribute to developing more inclusive policies that address diverse needs and challenges. Wiga shares that, "when we are educated and equipped with the right knowledge, we become strong voices for change in forest management."

"My role as a woman in this field is more than just a personal journey; it's about setting a positive example for my children and for the women in my village. I hope to encourage other women to believe in their capabilities and show them that they, too, can play a significant role in shaping a sustainable future for our community"

Westhi Wigaringtyas

Table 1. Comparison of women's roles in Kostajasa, 2011 vs. 2023

Year	Primary roles of women	Percentage of participation
2011	Food preparation for men's activities	5%
2023	Land management, decision-making, training	35%

Source: Kostajasa (2023)

Conclusion

Looking to the future, Wiga's story serves as a powerful reminder that sustainable development, when coupled with gender equality, is a potent force for breaking down barriers — cultural, institutional and systemic. The United Nations recognizes this synergy in Sustainable Development Goal 5, which highlights gender equality as not just a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world.

By challenging traditional norms and creating pathways for women's participation, collectives such as Kostajasa are unlocking gender inclusivity as a solution to complex environmental challenges. The transformation at Kostajasa is not just about increasing women's participation but about reimagining leadership, conservation and community resilience through a gender-inclusive lens.

Wiga's legacy extends beyond Kostajasa, aligning with global initiatives that recognize women's crucial role in forest protection. Each woman who steps into a role previously denied to her is not just changing her own trajectory but reshaping the collective understanding of what is possible in sustainable forestry.

As efforts move forward, it is clear that sustainable forests, sustainable communities and a sustainable planet require the full, equal and meaningful participation of all stewards, regardless of gender. Wiga's story is a call to action: promoting gender equality in forestry not only breaks down barriers but also leads the way to more effective, inclusive and resilient approaches to environmental conservation and community development.

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A water-harvesting ditch that Charity installed on her compound to improve agriculture and tree-growing conditions. Photo: Sarah Juster

4.4 Refugee women grow trees to protect people and forests in northwest Uganda

Sarah H. Juster, John F. Munsell and Mary Njenga

Introduction

"Just as trees protect us, we need to protect trees. Trees need to be protected worldwide, no matter where you are staying."

Charity, general secretary and founding member of TRAYOL

Refugee displacement is an escalating global challenge that presents challenges — as well as opportunities — for the management and use of trees and forests. Tree cover loss is of particular concern in developing countries, which host the majority of the world's estimated 43.4 million refugees (UNHCR, 2024), and where refugees and host communities alike often rely on trees for building materials and fuelwood for cooking meals. Tree cover loss is also caused by land clearing for agricultural production to meet growing food and economic demands (Maystadt et al., 2019), and when unsustainable logging and charcoal production are primary livelihood activities (Bernard et al., 2022). Removal of trees in refugee settings can have negative social and environmental consequences. Those include the disruption of ecosystem health and groundwater recharge (Black, 1994), and the loss of wild non-timber forest products (NTFPs), which are used by refugees and host communities as food, medicine and fibre (Grosrenaud

et al., 2021). Insufficient access to trees can also increase the risk of exposure to gender-based violence for women and children, as the primary household-level collectors of fuelwood, when travelling long distances from home in search of wood (Mulumba, 2011).

Tree loss has affected the refugee-hosting regions of Uganda, the country that hosts the most refugees of all African nations. Most of the 1.7 million refugees within Uganda are escaping civil conflict in South Sudan and the Democratic Republic of Congo (UNHCR 2023). Analysis of remotely sensed imagery identified a 1,900-km^2 decrease in natural ecosystems in Uganda's West Nile sub-region between 2016 and 2019 (Bernard et al., 2022), where six refugee settlements are located. These ecosystems include woodlands, wetlands and savannah vegetation. Much of the tree removal is attributed to fuelwood harvesting and charcoal production by both refugees and host-nationals (Bernard et al., 2022). Although refugees in Uganda are provided with long-term access to small plots of land for home-building and agricultural activities, these plots rarely contain sufficient tree biomass to meet ongoing fuelwood and home-building demands, causing refugees to look for these materials in the surrounding woodlands and forests.

This article examines the challenges associated with deforestation in refugee settings, as well as refugee-led and woman-initiated efforts to address these challenges, through the case study of Charity, a South Sudanese refugee who has lived in Uganda since 2017. Charity's experience highlights the specific difficulties faced by refugee women, as well as the creative solutions these women have developed to protect local forests, and by extension, improve their own welfare.

Information for this article was collected through interviews with Charity conducted in December of 2024 in the Imvepi refugee settlement of northwest Uganda. Charity, who gave permission to include her first name and photographs of her in this article, also provided a tour of tree-planting activities around her homesite and the homes of her neighbours. This article is also informed by ongoing research conducted by the authors focused on fuelwood access challenges and tree-based solutions in Imvepi and other refugee settlements in Uganda.

Deforestation in displacement: specific challenges for refugee women

Safety

Collecting fuelwood to cook daily meals is a task traditionally carried out by women and girls in Ugandan refugee settlements. The extensive amount of time spent on fuelwood collection draws women away from other important household activities, looking after children, or pursuing education. Fuelwood collection is physically demanding work, as most wood is carried home from the bush on foot (Mulumba, 2011). Additionally, the collection and use of natural resources such as fuelwood, grass

Woodlands surrounding Imvepi refugee settlement, where fuelwood is often harvested. Photo: Sarah Juster

and water can be a primary source of conflict in refugee settings given the high levels of demand and limited supply. Fuelwood collection thus disproportionately exposes women to resource conflict, including the risk of sexual and gender-based violence when travelling long distances to harvest fuelwood (Kumssa et al., 2014). Preliminary data collected by the authors from a sample of 120 refugees within Imvepi refugee settlement indicates that 46% of women refugee respondents had experienced conflict with either hosts or other refugees while collecting fuelwood. Levels of conflict range from being yelled at, being chased, and having machetes stolen, to in extreme cases, physical attack and rape.

Loss of access to needed products

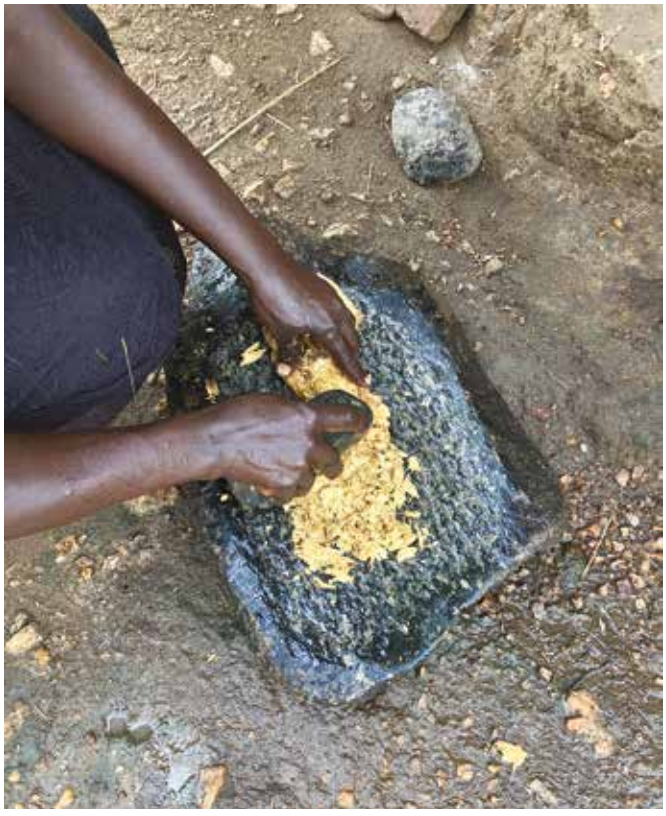
In the region of northern Uganda and South Sudan, women use wild NTFPs to a greater extent than men do, and retain greater control over the gathering, processing and selling of these products in local markets (Masters, 2021). The products include edible greens and fruits, tree leaves and fibres for basketry, and a wide diversity of medicinal products with critical sociocultural and functional importance for women in caring for their children, particularly where Western pharmaceuticals have limited availability (Kamatenesi-Mugisha and Oryem-Origa, 2007). Such products can provide women with livelihood opportunities through their sale at market. Furthermore, the regular use of NTFPs can be critical to sustaining the traditional ecological knowledge of refugee women, who apply generationally acquired ethnobotanical understanding of plant use from their countries of origin in settings of forced displacement. The depletion of woody biomass from forests and woodlands for fuelwood reduces the available habitat for wild NTFPs, which is concerning from both a human welfare and environmental perspective. From an environmental standpoint, the long-term conservation of native and potentially endangered NTFPs may be threatened as areas of natural forests and woodlands decrease due to fuelwood and building material consumption, and to charcoal production.

A woman-led, community-based response to protect trees and people in refugee settlements

Charity arrived at the Imvepi refugee settlement, located in Uganda's northwest corner, in 2017 as a single mother with small children. Facing increased civil violence in her hometown in South Sudan, she left behind her work as an accountant and fled to the Ugandan border. Once she reached the border, a bus operated by the United Nations High Commissioner for Refugees (UNHCR) brought her to Imvepi, where she was provided with 2,500 square metres of dry, rocky land on which to rebuild her life. In accordance with Uganda's refugee hosting policies, small land parcels are provided to refugees at no cost through long-term land leases negotiated between Uganda's Office of the Prime Minister (OPM), UNHCR, district governments and local land-owners. This model is intended to support refugee self-reliance and socioeconomic integration. Charity built four shelters on her plot of land, with each shelter requiring 18 trees for roofing materials. She also began to cut small trees and branches for fuelwood. Although Charity was careful to retain a few large native trees for protection against the strong winds that can whip through Imvepi and easily damage thatch-roofed homes, her plot was quickly depleted of most tree cover, forcing her to begin collecting her fuelwood in the woodlands and forests surrounding the settlement.

In 2024, a woman was raped in the area where Charity and her neighbours collected their cooking fuelwood. The victim was a refugee woman who walked to the

Fuelwood collection in the Imvepi refugee settlement. Photo: Sarah Juster



Charity prepares the roots of *Acacia hockii*, a native medicinal tree found in the bush, for treating cough. Photo: Sarah Juster

Tree seedlings raised by Charity, with mango leaves used as seedling wrappers. Photo: Sarah Juster

bush alone to pick up fuelwood, which she previously cut and hid to dry so it would be lighter to carry. This incident of gender-based violence was deeply troubling to Charity and her neighbours. Staff from OPM, UNHCR and other humanitarian organizations in Imvepi responded by convening community meetings. They issued new guidelines for fuelwood collection, such as to always travel with a group when collecting wood and to seek the permission of local land-owners before cutting trees. But Charity and her neighbours did not wish to return to the bush for fuelwood. Instead, they decided to focus their efforts on practising and promoting new solutions to meet their cooking energy and building material needs, while protecting the native forest ecosystems that their livelihoods depend on.

Replanting trees

From 2023 to 2024, Charity participated in an agroecology and tree-planting programme implemented by the NGO DanChurchAid (DCA), one of the key organizations promoting environmentally focused interventions in Imvepi. The concept of this programme, and of other tree-based interventions implemented in the settlement, is to maximize the tree-growing capacity of the small plots of land on which refugees are settled. This can enable participants to better meet their fuelwood needs without travelling to the woodlands. The programmes distribute tree species such as *Tectonis grandis*, *Melia volkensii*, *Gmelina arborea* and *Senna siamea*, which are fast-growing producers of fuelwood and building poles, and can also be coppiced for future regrowth.

Access to tree seedlings for planting at home can be limited or poorly timed, however, even for participants within these programmes. Tree seedlings grow best when they are distributed and planted well before the second rainy season (July through October) to withstand the brutal heat of Imvepi's dry season. Feeling curtailed in their efforts to grow trees because of a lack of available seedlings, Charity and her neighbours established small tree nurseries on their home plots and began to grow seedlings and distribute them to other refugee households in the settlement. This was the start of their community-based tree planting initiative, called Tree Replantation At Young Ornamental Level (TRAYOL). TRAYOL focuses on the challenges faced by women, and a majority of its executive leadership positions are filled by women.

In addition to the distribution of tree seedlings, Charity and the other women engaged with TRAYOL are role models and community educators, spreading the importance of growing trees on home compounds. Charity currently

maintains 169 trees on just 2,500 square metres of land. These trees have made her self-reliant in her supply of fuelwood, which she acquires by pruning tree branches and occasionally cutting small trees that she replants. She has also uses wood from her trees to build fences, structures for climbing beans, and shade structures for poultry. She enjoys the many environmental services that trees provide, including windbreaks, shade for children to play, and leaf material for mulching crops. Through TRAYOL, Charity has delivered training on the integration of trees within home compounds and how to manage tree growing alongside domestic activities. These training sessions have empowered other women in her community, including both hosts and refugees.

Conserving and managing native woodlands and forests

By growing trees as a sustainable source of fuelwood and building material, Charity and other TRAYOL participants contribute to forest conservation by reducing pressure on the use of native trees. As Charity explained,

Some of the 169 trees that Charity has planted at her home compound. Photo: Sarah Juster

A tree nursery on the plot of a TRAYOL member, used to grow seedlings to distribute to other refugee households. Photo: Sarah Juster

A fuel-efficient Lorena woodstove, which can significantly decrease fuelwood consumption and exposure to smoke among women. Photo: Sarah Juster

Charcoal briquettes hand-crafted in Imvepi for improved fuel efficiency. Photo: Sarah Juster

"...the more we invest in tree planting, it will give time for the natural ones to regrow. So as we continue getting cooking energy from the branches of the trees which were planted at home, our natural trees keep on growing, and we shall not even destroy them."

Charity

Other conservation measures that Charity promotes are methods to reduce wood consumption through alternative cooking technologies. One of these is the Lorena cooking stove, constructed from locally sourced materials such as sand and clay; it can reduce fuelwood consumption by an estimated 20–30% when compared to traditional, three-stone open fires (Barbieri et al., 2017). TRAYOL also promotes the use of charcoal briquettes, which are compressed blocks of carbonized biowaste such as charcoal dust. Charcoal briquettes burn longer and have greater heat consistency than fuelwood. They are also a source of income when sold to other refugees and hosts in the settlement.

Where refugees' fuelwood needs are not entirely met on their plots, as in the case of large households, refugee women need to continue to travel to the native woodlands and forests surrounding Imvepi to collect wood and other NTFPs. Along with the guidelines issued by OPM and other humanitarian groups, TRAYOL recommends certain tree-cutting protocols to mitigate the overall impact on forest resources and reduce the rate of forest depletion. These include cutting only two of any five trees in a stand and pruning tree branches instead of cutting whole trees whenever possible. TRAYOL and other groups have marked certain native tree species that are threatened by charcoal production, such as *Tamarindus indica* and *Vitellaria paradoxa* (shea nut trees), with red paint to deter cutting and save them. Charity and other TRAYOL members conduct community sensitization meetings with women to discuss these strategies and underscore the importance of protecting forests for the continued supply of medicines, foods, fibre and fuelwood that refugees and hosts both need. Since its formation in 2024, TRAYOL has conducted two such sensitization meetings, engaging a total of 144 refugee and host women.

Conclusion and recommendations

Tree-based interventions are critically needed in refugee displacement contexts to address widespread tree loss, which has negative repercussions for people and forests. Although organizations have introduced a range of interventions, with varying degrees of success, the most effective may be women-led efforts that are designed by, and thus tailored to, the specific needs of women, who are primarily responsible for the harvesting and use of wild NTFPs. Engaging women in these efforts can also provide empowerment opportunities and challenge regional gender norms whereby women are traditionally less involved than men with the planting and ownership of trees.

As leaders of TRAYOL, Charity and her women neighbours demonstrate an effective woman-to-woman model of community sensitization and education on best practices for safe travel to forests for NTFP collection and sustainable harvesting techniques to ensure that NTFPs will continue to be available in the future. They also demonstrate the ability of refugee women to integrate tree growing and tree seedling production with domestic activities. As conditions for survival in refugee settings globally are threatened by intensified climate change and the loss of foreign aid, community-based and women-led efforts such as those promoted by TRAYOL should be replicated and promoted to support the environmental, social and economic well-being of women in displaced and hosting communities alike.

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4.5

Women crossing a log bridge in a remote village of Uttarakhand. Photo: Aditi Mishra

Women protecting forests in Uttarakhand, India

Custodians of forest conservation and fire mitigation

Aditi Mishra, K. Chandra Sekar and Harshit Pant

"The forest gives us life — how could I let it burn?"

Harshita, a 32-year-old mother from Gular village, Almora, Uttarakhand

Introduction

The women of Uttarakhand, India, quietly shoulder the immense responsibility of protecting the region's forests. In the heart of the state's lush Himalayas, oak (*Quercus* spp.), deodar (*Cedrus deodara*), pine (*Pinus* spp.) and rhododendron forests stand as silent witnesses to centuries of ecological harmony and human resilience. Harshita, for example, bravely fought back an advancing fire to protect her home; like her, countless women across these villages act as the first line of defence against environmental threats. For generations, these verdant landscapes have been safeguarded not by institutions or policies alone, but by the relentless dedication of women from forest-dependent communities. This article explores the critical role of women in forest conservation and fire mitigation in Uttarakhand, drawing from academic literature, historical accounts and field studies.

Uttarakhand's forests are among the Earth's most ecologically significant landscapes. The Indian Himalayan Region is a global biodiversity hotspot with diverse flora and fauna, high endemism, and economically significant medicinal and woody plants. The region holds immense ecological, cultural, economic and social value. For the local communities, its forests are lifelines, providing fuelwood, fodder, medicinal plants and sustainable livelihoods. However, they face constant threats from climate change (Mishra et al., 2024); the delicate balance of the ecosystem is under severe strain due to many climatic and anthropogenic factors. Rising global temperatures, large-scale deforestation, and unsustainable human activities have left these forests increasingly vulnerable to devastating fires (Robinne et al., 2018). Wildfires are no longer rare, isolated events; they are becoming frequent disasters, threatening lives, livelihoods and nature, while affecting local, regional and global communities in multifaceted ways.

As rising temperatures and human-induced activities exacerbate the risk of wildfire, women emerge as defenders of the environment and as architects of ecological resilience. Just as Nanda Devi, the sacred mountain of the Himalayas, is revered as a guardian of balance and protection, these women stand as sentinels of the forests, preserving harmony between humans and nature. From leading grassroots movements to spearheading wildfire prevention efforts, they demonstrate unparalleled courage, knowledge and commitment. Recognizing and amplifying their contributions is essential for a sustainable future: one where forests thrive, communities prosper, and the delicate balance of nature is preserved.

Women's leadership in environmental movements

For generations, women in India have spearheaded environmental justice movements, driving community-led efforts to safeguard their lands, resources and futures. These movements extend beyond environmental preservation, addressing the intersections of social justice, sustainability and community resilience.

Women have been the first line of defence against ecological exploitation for centuries. In 1731, Amrita Devi of Rajasthan's Bishnoi community sacrificed her life to save

Left and right: The devastating impact of wildfires on ecosystems and communities. Photo: Aditi Mishra

Women carrying fuelwood from the forest. Photo: Aditi Mishra

khejri trees (*Prosopis cineraria*) from being felled by the maharaja's forces. Her declaration, *"If a tree is saved, even at the cost of one's head, it's worth it,"* continues to resonate as a rallying cry for ecological justice (Dankelman, 2010, p. 224). The Bishnoi community's conservation efforts remain a model of sustainability, highlighting the deep cultural and spiritual ties between women and forests. This deep-rooted environmental consciousness led the way for later efforts, including the Chipko movement of Uttarakhand.

The Chipko movement, which began in the 1970s, epitomizes women's leadership in environmental conservation. In the village of Raini, women led by Gaura Devi and Bachni Devi physically embraced trees to prevent their felling, declaring, *"The forest is our mother's home, and we will defend it with all our might"* (Jain, 1984). Traditionally, women were responsible for collecting fuelwood, fodder and water, giving them firsthand knowledge of the ecological consequences of deforestation. Their activism was not just focused on saving trees — it was about protecting their livelihoods, preventing soil erosion, and preserving water sources vital to their survival.

Building on the Chipko legacy, similar movements have emerged in Uttarakhand and beyond, with women continuing to play a central role. Even today, in Raini village, women have carried forward Gaura Devi's mission by actively opposing illegal mining and deforestation (Mathur et al., 2023). Their ongoing efforts demonstrate that women are not passive victims of environmental degradation, but active custodians of forests and leaders in conservation.

Community-conserved forests

Community-conserved forests (CCFs) in Uttarakhand exemplify the synergy between environmental stewardship and sustainable livelihoods, with women serving as the cornerstone of these efforts (Nautiyal, 2008). These forests are maintained through collective efforts; local communities establish rules for resource use, ensuring that the area's ecological integrity is not compromised. As primary stewards of these mountain forests, women play a vital role in conserving them and in ensuring the continuance of traditional practices that link cultural beliefs to ecological stewardship.

One of the most notable CCFs is Thal Kedar forest in Pithoragarh, an 800-year-old sacred site protected by local villages (Joshi et al., 2023). Women monitor forest health, prevent overharvesting and enforce community-set bans on green felling and commercial exploitation. Their efforts sustain biodiversity while ensuring that the forest continues to provide essential resources such as medicinal plants and wild edibles.

The Nanda Sain forest is another example of women's conservation leadership. Over a century ago, women in Nanda Sain resisted British efforts to establish pine plantations, advocating for native oak *(Quercus leucotrichophora)* to support water retention and biodiversity (Rawat, 1999). This movement inspired broader community forestry efforts and remains influential today. The women's leadership extends beyond direct conservation; they are also custodians of

traditional ecological knowledge, using folklore and rituals to educate younger generations. However, urbanization and modernization pose challenges to these systems (Khan, 2008), prompting women to advocate for blending indigenous and Western conservation practices. In 1988, women in the region again actively resisted commercial pine plantations, instead promoting oak cultivation for its ecological benefits. To further protect the forests, they implemented wildfire prevention strategies, such as creating natural firebreaks, to safeguard biodiversity and water sources.

Women on the front lines of wildfire mitigation

Wildfires are one of the most severe threats facing Uttarakhand's fragile ecosystems, and women are at the forefront of efforts to prevent and mitigate them (Sagar et al., 2024). Their leadership, particularly in grassroots organizations and community-based initiatives, has proven indispensable in preventing and combating wildfires (Agarwal, 2010).

The *Maiti Andolan* (Mother's Home Movement) illustrates women's role in wildfire mitigation (Sati, 2023). Founded by Dr. Kalyan Singh Rawat in 1995, this movement encourages communities to plant saplings of oak (*Quercus leucotrichophora)* — known for its water-retaining properties — during weddings and other ceremonies, fostering a culture of forest regeneration. Women in villages such as Gwaldam have taken the lead in nurturing these saplings, ensuring that they grow into fire-resistant forests that also provide long-term ecological benefits. This grassroots approach aids in wildfire prevention and strengthens the bond between communities and their natural surroundings.

Another compelling example is the Sitlakhet model in Almora. Here, women have mobilized under the "Save Forests, Save Life" campaign to address the growing threat of wildfires. Recognizing their deep reliance on forests for their daily needs, women play a central role in wildfire prevention through controlled burning, regular monitoring of fire-prone areas, and community-wide drills. The Sitlakhet model is an ongoing initiative that fosters collaboration between *jan* (local communities) and *tantra* (forest officials)**,** empowering women through training, incentives and leadership roles in conservation (Sebastian, 2022). Their efforts have significantly reduced wildfire incidents, highlighting the power of proactive, community-driven solutions.

Women's traditional knowledge plays a crucial role in these efforts. As primary users of forest resources, they are acutely aware of environmental changes and potential wildfire risks (Wan et al., 2011). This knowledge enables them to act swiftly during wildfire emergencies, often coordinating with local forest departments to contain the fire. Despite limited resources, their ingenuity — using basic tools such as green branches, soil and water — has repeatedly saved large tracts of forest from destruction.

Across Uttarakhand**,** women have taken on crucial tasks in wildfire prevention and response, forming community-led patrols to monitor fire-prone areas during the dry season. They act as first responders, equipped with mobile phones, fire beaters and traditional tools to contain wildfires before they escalate. Their collaboration with forest officials has significantly strengthened wildfire management, reducing response time and preventing fire spread. Additionally, the state's pioneering inclusion of women in wildfire brigades since 2023 has further bolstered their role, proving that community-driven efforts, combined with institutional support, are crucial in tackling Uttarakhand's ongoing wildfire crisis (Nagarkoti, 2024).

The work of women in fire mitigation extends beyond prevention and response. In areas affected by wildfires, women lead reforestation initiatives, planting native species that restore soil stability and enhance biodiversity. A key example is the Harela Festival, a traditional celebration in Uttarakhand where communities — led largely by women — plant trees to mark the onset of the monsoon (Mishra and Uniyal, 2024). This practice not only rejuvenates degraded landscapes but also strengthens ecological resilience. By blending traditional customs with modern strategies, women play a crucial part in rebuilding forests and preparing them to withstand future risks.

Challenges and systemic barriers

Despite their pivotal role, women in Uttarakhand face systemic barriers that hinder their full potential as environmental stewards. Patriarchal norms often exclude them from decision-making processes, relegating their contributions to informal or unrecognized roles. For instance, although women actively engage in firefighting and forest conservation, community leadership and resource allocation largely remain dominated by men. Institutional policies also frequently fail to formally acknowledge women's efforts. Additionally, cultural expectations often confine women to domestic roles, dismissing their expertise and leadership in conservation efforts.

Economic vulnerabilities further compound these challenges. With men increasingly migrating elsewhere for work, women bear greater responsibility for household and forest-related labour, relying on forest resources for fuel, fodder and livelihoods. Initiatives like self-help groups have provided some relief, enabling women to diversify their income sources and build resilience. However, meaningful systemic interventions are necessary to empower women as equal stakeholders in forest governance; these will require both legislative and policy reforms and shifts in societal attitudes.

Policy recommendations

Empowering women in forest conservation and wildfire mitigation demands addressing systemic challenges while harnessing their capacities (Dushkova and Ivlieva, 2024). Formal recognition of women's roles, and the provision of resources, are crucial for sustainable outcomes.

Investing in training programmes to equip women with skills in modern firefighting and forest management is essential. These should include practical techniques such as wildfire prevention, controlled burning and sustainable harvesting, alongside education on forest policies to enable advocacy for equitable governance.

Creating opportunities for women in sustainable economic activities tied to forest resources is equally important. Community-based enterprises centred on non-timber forest products (NTFPs) such as medicinal plants and organic produce can foster financial independence and ecological preservation. Policies must support access to markets, technology and credit, to ensure viability and community ownership.

Strengthening collaboration among local communities, government bodies and NGOs is vital in order to blend traditional ecological knowledge with scientific practices. Women's insights into biodiversity and resource management should be documented and integrated into conservation strategies, with participatory approaches scaled across regions.

By addressing these priorities, Uttarakhand can fully empower its women as environmental custodians, supporting both forest conservation and resilient communities to effectively combat climate change.

Women leading community-driven afforestation efforts in Uttarakhand. Photo: Harshit Pant

Conclusion

The forests of Uttarakhand owe their resilience and vitality to the tireless efforts of women whose contributions remain the cornerstone of environmental conservation. These guardians of nature, often working without recognition, have safeguarded sacred groves, mitigated wildfires, and revived degraded ecosystems. Their role is not merely supportive, but transformative, as they combine traditional ecological knowledge with grassroots activism to create sustainable solutions.

In high-altitude regions, where men have migrated elsewhere for better opportunities, women remain at the forefront of environmental efforts, combating wildfires, conserving biodiversity, and ensuring the survival of communities and landscapes. These women embody an enduring spirit of guardianship. Their efforts, deeply rooted in cultural reverence, reflect a profound connection to nature — one that transcends mere survival to become an act of devotion. Protecting these landscapes is not just an ecological duty but a cultural and spiritual commitment for these women. Yet, their critical roles remain undervalued in policy discussions.

To ensure the sustainability of Uttarakhand, it is imperative to sustain its women — by recognizing their contributions, addressing barriers, and investing in their potential. Their knowledge, resilience and leadership must be amplified to craft a future where forests thrive and communities prosper.

Gaura Devi once symbolized the spirit of conservation in the Chipko Movement; today's women in Uttarakhand continue to embody that legacy. By integrating their efforts into conservation policies and practices, they can create an enduring model of ecological balance. When acknowledged and supported, they will lead the way to a sustainable Uttarakhand, a beacon of harmony between humanity and nature.

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FEATURE ARTICLE

The Indigenous Ikalahan women of the Philippines

Exploring their role in forest stewardship through narrative portraits

Elaine Anne Parlade

Introduction

This article highlights the vital role that women, particularly those in Indigenous communities such as the Ikalahan tribe from the Philippines, play in forest stewardship. Through the Narrative Portraits method, the author conducted a walking interview with Asami Segundo — an Indigenous Ikalahan woman and founder of the women-led group, Ikalahan-Kalanguya Youth Organization for Sustainable Development (IKAYO) — visually documenting the conversation through photographs and audio. These immersive elements offer insight into the ways in which Ikalahan women engage with and protect their forests.

> *"We must ensure our voices are heard in a way that fosters true understanding and meaningful integration of our perspectives into policymaking."*
>
> Asami Segundo, Ikalahan woman

Above: Ikalahan women elders in Imugan, Nueva Vizcaya, Philippines. All photos and videos: Elaine Anne Parlade

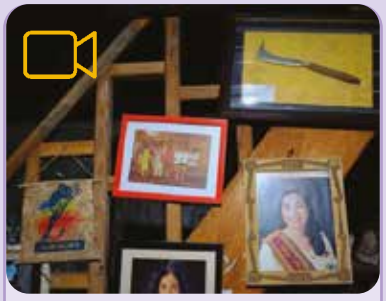
These elements also illuminate Asami's reflections on the central role of Ikalahan women in sustainable forest stewardship. These women not only advocate for environmental protection, but also actively foster the transfer of intergenerational knowledge, ensuring that Indigenous practices and values continue to shape their forest management efforts. Through their commitment and leadership, women like Asami are mobilizing the next generation to safeguard both their cultural heritage and the environment.

This article incorporates the Narrative Portraits method, integrating photographs and audio from an interview with Asami Segundo, founder of the women-led initiative, Ikalahan-Kalanguya Youth Organization for Sustainable Development (IKAYO). Her reflections and stories result in a co-created narrative that illustrates their connection to a particular place and issue. These multimedia vignettes offer an intimate glimpse into Asami's reflections on the role of Ikalahan women in forest stewardship and how their contributions are interwoven with the broader cultural and environmental changes occurring in the community.

Click on the icons for links to the videos

The Ikalahans

Nestled in the mountain forests of the barangay of Imugan, Nueva Vizcaya province in the Philippines is the Ikalahan-Kalanguya Indigenous group, whose connection to the forest is deeply embedded in their identity and way of life. The word *Ikalahan*, meaning "forest people," reflects their close relationship with the land they steward, from cultivating food to protecting water sources. For example, in their language, distinct words exist for various types of washing — for dishes, laundry or bathing — all reliant on water sourced from the waterfalls and streams they carefully safeguard. These natural water sources, nourished by the forest's ecosystems, meet their practical needs and also support their farming systems and cultural traditions.



Asami reflects on how elders, especially women, have shaped her understanding of forest stewardship and cultural preservation.
Click here to see the video

One of the reflections that deeply resonated during the conversation with Asami was her insight: *"Being Ikalahan doesn't mean that we have forests because of us, but rather, being Ikalahan means that we are here because of the forests."* This profound perspective captures the essence of the Ikalahan worldview, where the land and forest are inseparable from the community's survival and cultural identity. For the Ikalahans, the forest is not simply a resource to be managed, but the very foundation of their existence and heritage.

Asami, representing the Ikalahan community, participates in an online meeting from a café overlooking the Imugan forests.

Among the country's 150 cultural communities, comprising over 17 million Indigenous peoples (Poffenberger, 1999; UNOPS, 2024), the Ikalahans stand out as pioneers of community-based forest management. Their recognition stems from decades of resisting land-grabbers and government projects, culminating in the landmark 1974 Memorandum of Agreement No. 1. This agreement established the 14,730-hectare Kalahan Forest Reserve, granting the Ikalahans the authority to sustainably manage their ancestral lands while preserving their cultural heritage (Dolom and Serrano, 2005). The Ikalahans' proactive efforts extend beyond legal recognition; they have continuously deployed traditional ecological knowledge and community-led initiatives to safeguard biodiversity, water resources and vital forest

Imugan Falls, a vital source of water for the Ikalahan community.

ecosystems, which ensures the long-term sustainability of both their land and way of life.

Asami, an Ikalahan woman, has dedicated her life to the preservation and advancement of her community's cultural heritage. She wears many hats — serving as a volunteer technical and liaison officer for her community, the Regional Coordinator for Southeast Asia of the Indigenous and Community Conserved Areas (ICCA) Consortium, and the founder of the women-led IKAYO. Through IKAYO, she works closely with Indigenous youth to promote intergenerational knowledge transfer, cultural preservation and empowerment.

Asami did not fully grasp the value of the forests as a child, but after attending the Kalahan Academy and listening to her Elders, she came to realize that the forest is the source of life for the Ikalahans. The role of women Elders in maintaining cultural ties to the forest and passing down Indigenous knowledge has been pivotal in shaping her understanding.

As leaders in community-based forest management, the Ikalahan community not only safeguards their land, but also relies on the active involvement of Indigenous women. Their roles — specifically those of women Elders in knowledge transfer — are central to preserving both the forest and cultural traditions.

A house in the heart of Imugan's forest, where the community lives in close connection with the land.

Asami explaining the roles of Ikalahan women in swidden farming and forest conservation.
Click here to see the video

Swidden farming and forest stewardship

When asked about the role of women in forest stewardship, Asami immediately brings up swidden farming, or *inum-an* — an indigenous practice rooted in crop rotation and forest fallow cycles (de Luna et al., 2019). Historically, the Ikalahans made the transition from a lifestyle of hunting and gathering to *inum-an*, a system that balances agriculture with forest regeneration. Traditional gender roles were integral to this balance; men typically prepared the site, including clearing and conducting the controlled burn, while women focused on planting and tending the crops (Rice, 2001).

While the Ikalahan women's contributions are often seen in their role in planting, their impact extends far beyond that. They bring extensive knowledge of Indigenous farming methods such as *gengen* (composting on infertile farms with sweet potato vines), *balkah* (contour cropping), and *day-og* (in-situ composting on sloping land), which are vital for maintaining soil fertility and land productivity (Camacho et al., 2010; Dizon et al., 2008). Women

also expertly select and manage sweet potato varieties to ensure optimal growth while sustaining the surrounding ecosystems. Although some of these traditional methods have gradually fallen out of use as the community has reduced cultivation on steep slopes to allow forests to regenerate (Dizon et al., 2008), Asami highlighted how women continue to be knowledge holders, passing on Indigenous forestry and farming practices to younger generations.

This role was also evident in the author's undergraduate research, which documented Ikalahan women Elders demonstrating traditional swidden farming tools while sharing their historical significance. These implements (see

Top: An Ikalahan Elder demonstrating (left) how a kayabang (basket) is carried with an uyon (head strap); and (right) how a dopdop, a traditional tool, is used for planting and harvesting crops. Above: Essential tools for swidden farming — knife and bolos (cutting tools) — shared by Ikalahan women Elders.

photos) are not only used for farming and harvesting, but are also carefully maintained and passed down, embodying the community's sustainable forestry practices. All the photos that appear here (page 156) are from that 2014 fieldwork, which, although not publicly available, captured how women sustain sustainable forestry and cultural practices through intergenerational knowledge transfer.

Over time, the role of women in forest conservation has expanded. In addition to farming, they now engage in forest restoration efforts such as collecting seeds, gathering wildlings, potting and preparing seedlings. Asami shared that women nowadays are also involved in the technical aspects of forest stewardship, including conducting forest inventories, GIS mapping, geotagging, and managing forest resources. Their role in conservation continues to evolve, which demonstrates their deep commitment to both the land and the future of their community.

Ikalahan women's impact on forest stewardship and the rise of IKAYO

The Ikalahan community's forest stewardship is deeply tied to their cultural identity, and the growing involvement of young women in leadership roles reflects this connection. Asami's journey of understanding the forest's importance began with attending the Kalahan Academy and engaging in community exchanges where Elders shared their knowledge. Her shift in perspective mirrors a broader trend where youth, particularly young women, are stepping into leadership, not only in forest stewardship but also in community advocacy.

Key institutions, such as the Kalahan Educational Foundation (KEF) and its Kalahan Academy, have been instrumental in preserving Ikalahan culture and promoting education. These institutions, alongside intergenerational dialogues with Elders, laid the foundation for IKAYO's formation in 2023. Emerging from the youth's commitment to sustaining traditional knowledge, particularly in forest stewardship and swidden farming, IKAYO fosters cultural continuity, environmental stewardship and community vitality.

Primarily led by young women, IKAYO emphasizes intergenerational knowledge exchange and youth leadership. The Ikalahan women Elders have played a crucial role in mentoring and inspiring these young leaders, reinforcing a gradual yet essential process of empowerment supported by the community and institutional structures.

Challenges and opportunities

Although IKAYO symbolizes hope for the next generation of Indigenous leaders, significant challenges persist. Despite foundational support from institutions such as KEF and the Kalahan Academy, limited local livelihood opportunities hinder youth engagement in leadership and community development. As Asami shared, the scarcity of relevant jobs in the community prevents many young people from applying their education. Even as a licensed forestry professional, Asami faced similar challenges on returning to Imugan, highlighting the gap between young professionals' aspirations and the opportunities available to them.

This gap is also reflected in the personal symbols of Asami's journey, such as her graduation portrait and the farming tools displayed in her home (see photo, page 160). These encapsulate both her educational achievements and the cultural significance of her upbringing, which emphasizes the tension between her professional aspirations and the limited local opportunities.

The lack of stable employment forces many Indigenous youth to seek work in nearby towns or the rest of the country or abroad, distancing them from their culture and from potential leadership roles. For young Indigenous women, the challenges are even more pronounced. Community-based roles are often confined to teaching, farming or politics — important jobs, but not always aligned with their professional training or personal aspirations.

The situation is further exacerbated by the lack of sustained funding for community institutions. Short-term, project-based funding limits the potential of initiatives, preventing them from creating lasting programmes that could empower young women and foster long-term community engagement.

Asami, Imugan, Nueva Vizcaya, Philippines.

Asami emphasizes the importance of governmental recognition of Indigenous peoples' knowledge and rights, including incorporating free, prior and informed consent (FPIC) and self-determination, especially in terms of policy- and decision-making. Such recognition is critical to creating an environment where young Indigenous women can thrive as leaders.

Asami envisions a future where Indigenous peoples' voices, especially those of women, are respected, their rights are upheld, and their traditional knowledge is recognized as vital to addressing modern challenges such as biodiversity loss and climate change. She highlights the importance of amplifying Indigenous peoples' perspectives in policymaking, emphasizing that their on-the-ground experiences and innovative approaches can bridge the gap between technical policies and lived realities. Through storytelling, Asami underscores how Indigenous communities navigate these challenges, offering insights that inspire genuine understanding and action. She also stresses the need for policymakers to engage meaningfully with the diverse worldviews of Indigenous peoples, moving beyond token consultation to ensure that their voices are integrated into decision-making processes.

Conclusion: carrying forward the legacy of forest stewardship

Ikalahan women have long been central to forest stewardship, shaping the preservation of their community through farming, knowledge-sharing and cultural traditions. Their leadership, particularly in guiding the younger generation, has been essential in maintaining both the forest and cultural practices. As Asami reflects, however, despite their significant contributions, barriers — such as limited local opportunities, unstable or short-term funding for community-led initiatives like IKAYO, and inadequate institutional support — often hinder women's full

A foggy Imugan mountain village.

potential in forest management and leadership. These challenges are compounded by societal norms that, despite progress, still undervalue women's contributions in certain spaces.

Asami's reflections highlight the need for systemic change. She envisions a future where Indigenous women are not only recognized but actively supported as leaders in forest management and cultural preservation. This future requires long-term investments in education, leadership development, and community initiatives, fostering a place where women can thrive and contribute their invaluable knowledge. She also emphasizes the importance of recognizing Indigenous rights and knowledge, through processes such as FPIC, to ensure that women and youth can participate fairly in decision-making processes.

Her hope lies in the next generation, guided by the wisdom of their women Elders and the emerging leaders of IKAYO. The youth, inspired by the resilience and leadership of women, are reconnecting with their heritage and stepping forward to protect their ancestral lands. When Indigenous women, supported by their communities, are given the resources and opportunities they need, their leadership can drive social, cultural and environmental renewal.

> *"It's also important for us to share our stories... We need to listen to people on the ground. Indigenous peoples, who are deeply connected to the land, are part of this ground. For us, the earth is not separate from our lives — it is our life."*
>
> Asami Segundo, Ikalahan woman

Descending from the mountains of Nueva Vizcaya.

Asami's journey reflects the power of empowered Indigenous women as cornerstones of forest stewardship and community resilience. By addressing the systemic barriers they face and elevating their voices, the wisdom and vision of these women will continue to guide the future of their forests and communities for generations to come.

Asami's graduation portrait is displayed in her home, alongside farming tools.

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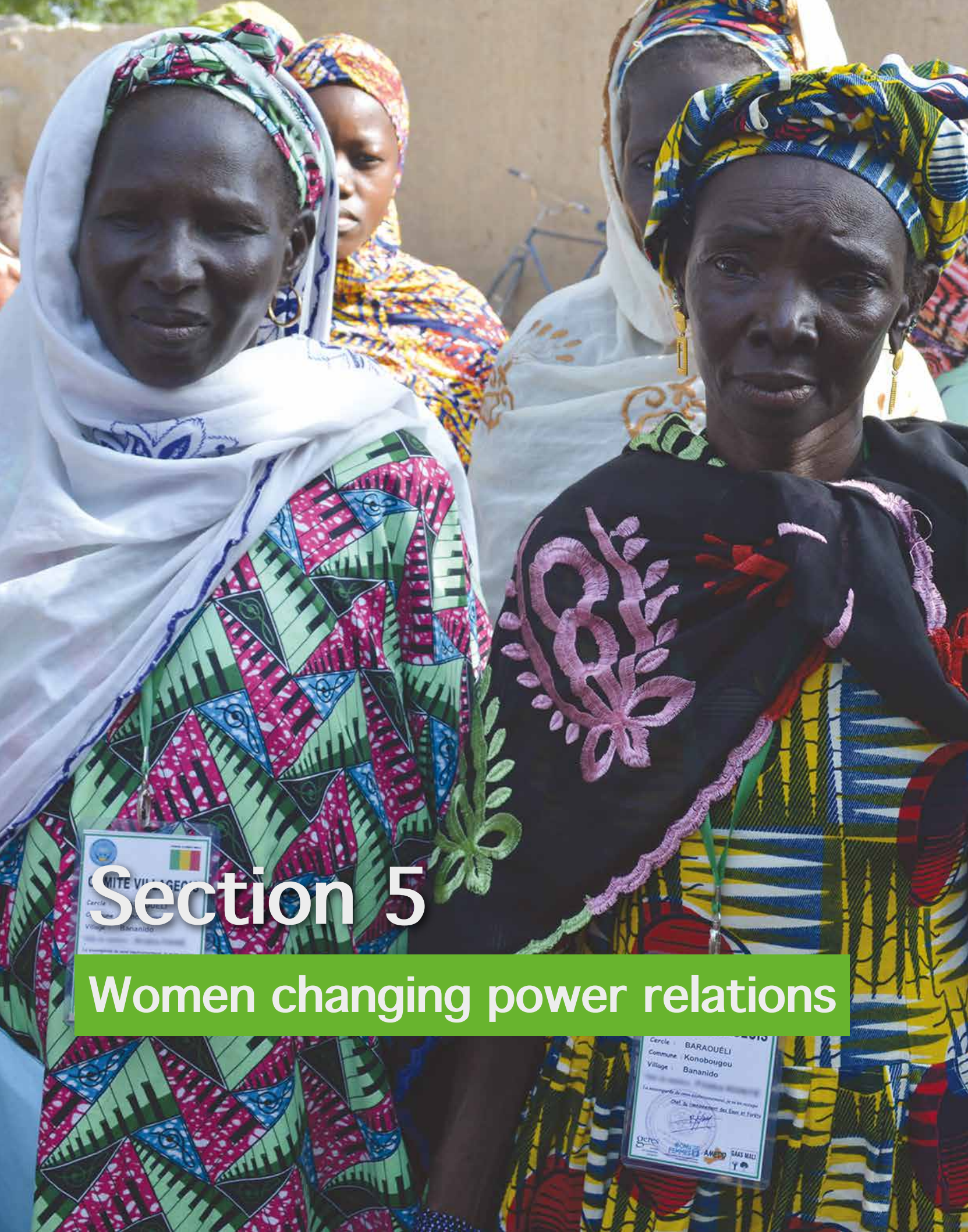

Section 5

Women changing power relations

Previous page: Women leaders members of a village committee on forest management. Photo: Métanga Justin Dembélé

Meeting of the women's organization of West Pokot County, Kenya. Photo: Edna Kaptoyo

5.1

Indigenous women's wisdom and agency

Protecting forests and biodiversity

Juana Vera-Delgado and Laura Bernard

"Our grandmothers crawled so our mothers could walk. Our mothers walked so we could run. And we're running so our daughters can fly."

An iteration of a widely cited quote

The quotation, left, contains a profound message about the struggles and victories that women have historically experienced in confronting patriarchal norms and colonial rules. Nowadays, the need for gender-transformative justice can no longer be ignored. Women increasingly have access to decision-making opportunities that used to be limited to men. In forest governance and conservation, women environmental and human rights defenders have been at the forefront of these efforts for centuries.

Shifting power dynamics: an historical overview

Today, politicians, scientists and even venture capitalists can no longer dismiss the fact that women have always played a leading role in the protection of forest ecosystems (Barriga, 2024). In spite of this understanding, however, women largely remain excluded from decision- and policymaking. In fact, where the extractivist colonial system has

taken over Indigenous lands, it has focused not only on preventing women from accessing key resources and decision-making forums, but has also relegated them to the lowest position of the colonial gender and racial hierarchies.

In Latin America, before the arrival of European colonizers in the 15th century, women held leadership positions in the political, religious and economic domains (Vera-Delgado and Zwarteveen, 2017). The prominence of women in religious and political affairs mirrored how these powers were shared between genders at the community level, in a type of system called gender-dual. This term indicates a societal order where women and men are ascribed different qualities and abilities, yet characteristics ascribed to men are not necessarily valued more highly than those ascribed to women: both are required for *buen vivir*, or "good living," which also extends to the natural world. Under this dual system, both men and women had access to land, with daughters inheriting through the maternal line. In addition, young women were able to choose their husbands.

For Spanish colonizers, this system — and the direct associations between human genders and genders of nature — was a threat to their goal of resource dispossession, and offensive to the Spanish customs and beliefs of that time. Convinced of the superiority and moral rightness of Christianity, the Spaniards considered the Indigenous cosmovision as sinful and barbarian. The fact that Indigenous daughters could inherit land through the maternal line and have a say in marriage fuelled a perception among Europeans that Indigenous men were lesser men: they saw "Indian" men as weak, with effeminate characteristics, unable to dominate both their wives and nature. Spaniards felt an urgent need to "civilize" Indigenous men to become "real" men, ready to dominate the "feminine" world. In the colonial period Indigenous women were confined to domestic care work and forbidden from entering the public — thus political — domain. These colonial/patriarchal measures weakened the position of women in society (Vera-Delgado and Zwarteveen, 2017).

Weapons of the weak: everyday politics and resistance

Subordinated and rendered nearly powerless, women learned to resist the imposition of patriarchy by using what Scott (1985) calls "weapons of the weak." Among other things, this resistance often took the form of quiet, persistent defiance, avoiding direct confrontation with authority while challenging dominant narratives in more nuanced ways. Becoming adept at contesting the Spaniards' goal of reversing the existing dual system and gender roles, women thus have shaped how the past and present of their local history and culture should be understood and labelled. For Indigenous women, confined to the private sphere, this resistance manifested in their unwavering care for Mother Nature, preserving traditional knowledge and ecological balance. Such acts of defiance, embedded in everyday life and largely unseen by those in power, continue to undermine oppressive systems from within and create the potential for lasting change.

When women have access to education, information and place-based programmes to strengthen livelihoods, their agency is reinforced. They increasingly question imposed gender boundaries, entering forums once forbidden to them. They start to denounce the violation of their rights and of the rights of Mother Nature publicly, sustaining legal battles with the support of men who are their partners and allies. Presently, women in all their diversity are organized in a range of movements, and they are joining high-level policy forums to demand protection of the planet and acknowledgment of their role in sustainable livelihoods.

Cases of everyday politics

Chile

In Chile, Mapuche women have conserved forests and biodiversity in their ancestral territories for centuries by promoting *k*üme *mongen* ("good living") — an ancestral wisdom that shapes the Mapuche way of life and upholds a harmonious and balanced relationship with nature. This involves taking care of seeds, trees and water, as well as traditional medicine and the transmission of traditions to children (Vera-Delgado, 2020). Since the colonial invasion, Mapuche women have continued to fight, alongside their husbands, to assert territorial claims, as explained by Sara Huincatripay: *"There are more women than men active in the struggle — growing food, working the land. We do this for our children because tomorrow we may not be here, but they will..."* (GJEP, 2025). The silent struggle of Mapuche women has become public since the enactment of the *Forestry Decree Law 701*, which promotes subsidized large-scale monoculture tree plantations in Mapuche territories. But as more women engage in open fights for the restitution of ancestral lands, they also face increasing militarization, repression and imprisonment.

Kenya

In the Kamatira Forest, in West Pokot County, Kenya, communities' identity and culture are strongly linked to the

forest. Women have traditionally taken care of medicinal plants and transformed forest products: weaving baskets, producing insect repellent, revitalizing traditional food systems, and practising agroforestry. Kamatira forest dwellers have faced displacement and large-scale logging of their native trees since the British colonial period, from 1920 to 1963. The native trees were gradually replaced by monoculture plantations for the timber industry and by cash crops and intensive livestock raising, resulting in biodiversity degradation and loss, as well as water pollution. In 2021, the Pastoral Communities Empowerment Programme (PACEP) mobilized community leaders, local authorities and 25 women's groups to build partnerships among them. The women's groups have since restored 20.2 hectares of degraded areas, planting native trees and establishing community nurseries. These initiatives have strengthened community resilience and biodiversity by increasing the availability of local food crops and improving the soil's ability to retain water. However, Kamatira's women are still prevented from accessing formal decision-making bodies; in addition, they assume most of the household burden and face gender-based violence.

Women's forest movements' legal battles

Bolivia

In 1990 Guaraní women, men and children marched for 600 kilometres from Beni to the capital La Paz to demand that the Bolivian government return their ancestral lands from the *terratenientes* (landlords). The dispossession of Guaraní territories started in the late 16th century, and people were enslaved by the Spanish. The illegal appropriation of these lands continued after the liberation of Bolivia, forcing Guaraní people to migrate to the urban slums of cities, enduring inhumane living conditions. Their misery and hunger pushed the Guaraní to undertake this excruciating 34-day journey, which led to the signing of four decrees, including the recognition of their Indigenous territories under the Constitution. However, the legislation did not translate into practice, and the Guaraní people have had to continue fighting in courtrooms to effectively recover their land, as in the case of the Guaraní women from Laguna Chica (Vera-Delgado, 2023). After years of struggle, these women, under the leadership of the *mrubicha* (traditional woman leader), won a legal battle in July 2019, regaining access to a small part of their ancestral forest (0.21% of the claimed land).

From the moment the land was recovered, the women immediately started to "cure" the deforested areas, which had been converted into industrial farmland and cattle ranches. They did this by planting local trees, recovering traditional agroecological practices, and "seeding" dried water sources (i.e., planting appropriate plants that filter and release rainwater, which creates new water sources and feeds existing sources). Within five years, the trees began to capture and filter rainwater, bear fruit, and provide shade for people and domestic animals. Importantly, these women earned respect at the local, national and international levels. Nowadays, Guaraní women from neighbouring communities seek advice from Laguna Chica's women to recover their ancestral lands.

Exchange on conserving the knowledge of Indigenous Congolese women during MBOSA days, DRC. Photo: David Udongo

India

Pondi village in Central India is another telling example of women protecting their environment. There, Indigenous Baiga women exercised their agency to protect the forest from logging, as documented by Tyagi and Das (2020). Pondi village's forest was subject to deforestation, which fuelled significant tensions between loggers and villagers. Defying imposed gender roles, seven women stood up against the logging by the forest department, managing to convince other women and ultimately, the whole village, to join the fight. At the start, the men in the village tried to discourage the women, preventing them from joining meetings and actions. Nevertheless, the movement grew and led to the establishment of Community Forest Resource (CFR) rights, under India's *Forest Rights Act* of 2006. It is worth noting that, after the formal recognition of CFR for Pondi and the cessation of logging, the perception of women's place and role in community politics changed:

Peru

In the Peruvian Amazon, Indigenous Kukama leaders won a legal case against an oil company after years of struggle. The women, organized in the Huaynakana Kamatahuara Kana women's federation, filed an injunction against Petroperú, a Peruvian state-owned petroleum company. Until 2021, the year in which the Kukama women began their fight, Petroperu had caused at least 108 oil spills into the Marañon River over more than 40 years, severely affecting the river's fauna and flora (Yaranga, 2019). By initiating the legal battle, Kukama's women expressed in court that they were not only defending their rights to a just and healthy livelihood, but more importantly defending the inherent right to life of both the river and the forest, which are seen as sacred living entities by the Kukama (Vera-Delgado, 2024). The victory in 2023 of Kukama women is of enormous significance for Peru, providing inspiration for the struggles of the Amazonian communities against the many extractive activities that are destroying their sacred territories. For instance, one year after this victory, the Autonomous Amazonian Movement of the Wampis Nation mobilized for the first time to protest illegal mining and logging on their territory.

"What started essentially as [a] livelihood struggle [in India] transformed into an environmental movement, breaking stereotypes and reimagining women's leadership role in environmental sustainability [...] it served as an entry point for women's political inclusion in the forest governance institutions leading to better governance outcomes."

Tyagi and Das, 2020, p.8

These are some of the many case studies around the world in which women's movements contributed to safeguarding the environment and to the livelihoods

Protest by the All India Forum of Forest Movements (AIFFM). Photo: GFC

UNFCCC COP 29, Baku: (l–r) Isabel Prestes Fonseca, Francesca Trotman, Anisa Abibulloeva and Yudmilla Chunguane. Photo: Sarah Kuck

of entire communities. Some of these movements became formalized through the creation of civil society organizations, achieving recognition and credibility beyond their communities.

Support for feminist civil society organizations

So how do the struggles of grassroots women find their way to high-level policy forums, where the crucial stakeholders for forest governance negotiate? Meetings such as that of the Foro Social Pan-Amazonico (FOSPA), or the United Nations Conference of the Parties (COPs) of the Conventions on Biological Diversity (CBD), Climate Change (UNFCCC), and to Combat Desertification (UNCCD) are key fora to recognize women's role as stewards of forests and biodiversity. Indeed, it is there that international binding agreements are signed, compelling various actors to act in line with approved policies. And since the early days of international advocacy, feminists have understood that the meaningful participation of women is facilitated by umbrella organizations such as Women4Biodiversity or the Women and Gender Constituency.

Several gender milestones have been reached, thanks to the ongoing advocacy efforts of hundreds of women from CSOs that are constituencies of umbrella organizations; these milestones include the adoption of the first Gender Plan of Action in 2017 under the UNFCCC. This plan recognized the direct linkages between gender and conservation. COP15 in 2022 was a special event, with the inclusion of stand-alone gender equality targets (T22 and T23) in the Kunming-Montreal Global Biodiversity Framework (GBF). Long awaited, this resolution was accompanied by the adoption of the respective Gender Plan of Action (GPA).

Despite these achievements, major challenges remain, including the effective and immediate implementation of Target 23 of the GBF, and the CBD's Gender Plan of Action. The Women's Caucus of the CBD has been advocating to demand that adequate resources be mobilized to implement the GPA. For example, resources are needed to strengthen the capacity of gender focal points to include gender in the reports of National Biodiversity Strategies and Action Plans (CBD-WC, 2024).

What can be learned from women as forest stewards?

As outlined above, women in all their diversity have developed multifaceted strategies to defend nature, acting across various fronts, from silent resistance at the grassroots level to organizing in women's movements to initiate lawsuits, or participating in CSOs to join advocacy efforts at high-level political forums. At the grassroots level, within their forest territories, women have exercised everyday forest conservation politics by taking care of plants, seeding native trees and replanting them in

Young Baiga women (Adivasi tribe), India. Photo: Simon Williams/Ekta Parishad

deforested areas, practising agroecology, and transferring valuable traditional knowledge and skills to the next generation.

When women have had opportunities to be informed and consulted, they resolutely entered the spaces once forbidden or limited to them, sustaining legal battles to denounce the violation of their rights and the rights of Mother Nature. The agency and care capacity of women are inspiring and can mobilize a range of actors who initially were reluctant to support women's claims, as shown in the case of Baiga forest in India.

So why have women developed these various strategies to safeguard biodiversity? In a recent dialogue held with women leaders from the Global South, a powerful message was articulated: caring for forests and biodiversity is synonymous with caring for life itself (Vera-Delgado and Vijayakumar, 2024). The participants emphasized the vital connections between the ecosystems that sustain them — forests, rivers, wetlands, mountains — and the diverse flora and fauna that inhabit these ecosystems.

Women's strategies presents a just and holistic approach to forest conservation, in contrast to frequently advocated top-down "solutions" such as REDD+, carbon offsets, and large-scale development projects (World Rainforest Movement, 2024). These "solutions" can in some cases exacerbate historical social and gender inequalities and undermine women's role as forest stewards (Women and Gender Constituency, 2021).

Recommendations

Several changes are needed to policy and practice:

- funding and benefits derived from forest and biodiversity conservation must go directly to Indigenous communities;
- the knowledge and leadership of Indigenous women must be acknowledged in policymaking;
- respect for free, prior and informed consent (FPIC) is essential, and violations of this principle should be prosecuted in court;
- local governments should work alongside Indigenous leaders to develop sustainable

resource management proposals, drawing on their ancestral knowledge and practices;

- decision-makers should explicitly recognize and formalize the rights of Indigenous peoples, women and girls as key leaders in three critical areas: communication, education and public awareness.

In order to prevent forest ecosystems from reaching the point of no return, these recommendations must be implemented. Understanding the correlation between women's struggles and their vision of the living forest is key to advancing towards real solutions for forest conservation and a transformative gender justice agenda.

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5.2

A focus group discussion with Dumagat people in Real, Quezon Province. Photo: Rafaella Potestades and Amanda Lee Centeno, Bayi Inc.

Women and natural resource management in the Philippines

Rosemarie Joy Quetula, Amanda Lee Centeno and Rafaella Potestades
With contributions from Himaya Tamayo-Gutierrez, Nelissa Maria Rocas, Joan Laura Abes and Bryan Joel Mariano

"A critical step toward achieving sustainable, inclusive and resilient landscape governance is women's empowerment in natural resource management through inclusive governance models."

Rosemarie Joy Quetula

Introduction

Filipinos depend significantly on natural resources for their livelihoods and sustenance. However, complex gender relations and dynamics affect the intersecting social identities that restrict women's access to, control over, leadership in, and decision-making regarding natural resource management (NRM) (Joshi et al., 2021). The inclusion or exclusion of rights to access, control, leadership and decision-making in NRM is political and related to institutionalized gendered social beliefs and expectations (Ravera et al., 2016). Despite ongoing efforts to promote gender equality, patriarchal norms and traditional roles continue to shape the power structures in the NRM sector in the Philippines (Rodriguez, 1990).

In the past few years, Filipino women have made significant strides in various disciplines, actively participating in multiple professions such as academia, health, business, politics and legislation (Orias, 2008). However, they remain constrained from taking on leadership roles due to family and reproductive tasks such as caregiving and household responsibilities (Anonuevo, 2000). In contrast, men dominate paid work and leadership roles (Tabassum and Nayak, 2021).

Bayi Inc., a feminist organization advocating for gender justice and women's full and meaningful participation in women's empowerment, led the study discussed in this article, with support from Forest Foundation Philippines. Bayi Inc. and the Forest Foundation Philippines acknowledges the various factors that limit women's access to and control over natural resources in the country and in the study explored women's roles in NRM, focusing on the lived experiences of Indigenous communities. Through the study they aimed to introduce gender-focused approaches that promote resilient and inclusive nature-based solutions that are deeply rooted in sustainable and equitable landscape governance.

Consultation with the Tayabas City Environment and Natural Resources Office (CENRO). Photo: Rafaella Potestades and Amanda Lee Centeno, Bayi Inc.

Methodology

The study, conducted in May to June of 2023, employed a feminist qualitative approach with mixed methods, integrating quantitative data and open-ended survey questions to capture participants' insights on women's participation in the focal landscapes of Forest Foundation Philippines: Sierra Madre, Palawan, Samar/Leyte, and the Bukidnon/Misamis Oriental and Eastern Mindanao seaboard, including one of Bayi's focal sites, the Mount Banahaw area of the Mounts Banahaw-San Cristobal Protected Landscape. The focal landscapes span multiple legislative boundaries and play a crucial role in providing ecosystem services that support local and regional economies; this made them ideal study sites.

The online survey instruments revolved around the key themes and issues identified in the secondary data collected. Purposive sampling was used to select participants. The survey was disseminated online to 18 partner organizations. Of these, 12 organizations responded: eight (66.7%) were non-government organizations (NGOs), while four (33.3%) were people's organizations (citizen-led groups in the Philippines that promote the public interest).

Insights from the online survey shaped three focus group discussions (FGDs):

- one with representatives from the Tayabas Municipal Environment and Natural Resources Office (MENRO);
- another with 20 women safeguarding the Mount Banahaw area of the Protected Landscape in Tayabas; and
- a third with 11 Dumagat Indigenous women from the Sierra Madre Mountain range in Real (see Box 1).

These discussions examined how social and institutional forces influence women's participation in landscape governance. Bayi Inc. conducted a thematic analysis to identify patterns and insights by coding and categorizing interview notes and survey results. This provided a deeper understanding of women's systematic processes and diverse experiences in natural resource management.

Box 1. Mounts Banahaw-San Cristobal Protected Landscape and Sierra Madre Mountain range

The Protected Landscape is a major watershed for the provinces of Laguna and Quezon. It holds significant educational, aesthetic and biodiversity value, as well as cultural and religious importance to the country.

Referred to as the "backbone of Luzon," the Sierra Madre Mountain Range provides habitat for a wide range of flora and fauna, and is Luzon's defence against typhoons that come in from the Pacific Ocean. The range is also the site of many critical watersheds. Many years of mining, deforestation, resource exploitation and unsustainable land use have had negative impacts, threatening the inhabitants of the Sierra Madre as well as millions of other Filipinos (Forest Foundation Philippines, 2025).

While the feminist qualitative approach provides valuable insights into women's participation in NRM, its scope and conclusions must be understood to have certain limitations given that the study's geographical area may not fully represent the experiences faced by men and women in all their diversities.

Gendered roles and responsibilities in natural resources management

This section explores how gender and power dynamics in the Philippines shape the management and governance of natural resources (James et al., 2021; Peluso, 1991). It highlights the systemic barriers that women face and the opportunities that may provide them with more sustainable, inclusive and equitable governance of natural resource management.

Access, control over, use and ownership of resources

Men and women access natural resources differently, depending on cultural and physical considerations (Bjørning and Kiørboe, 2005). Such considerations are influenced by income, ethnicity, education, leadership and sociocultural norms. Societal narratives frame women's contributions to natural resource management as merely supportive, rather than central. The limited involvement of women in decision-making processes (Agarwal, 1992) can be seen in the disparity of land ownership in the country, where men own the majority of land and land title is often registered only in the husband's name. Women typically share ownership of property with their husbands, although access to ownership and the management or leadership of land may not always be equally distributed between men and women. A 2014 study by WOCAN shows that women only hold around 32% of Certificate Land Ownership Agreements (WOCAN, 2014). That study emphasizes that the reinforcement of gender imbalances in terms of ownership affects women's ownership, access and agency in participating in NRM.

In addition to these ownership imbalances, women are restricted to supportive, reproductive and nurturing roles that often centre around food production and soil protection nearer to home, such as lowland forests, nurseries and nearby mangroves. Conversely, men engage in resource-intensive and extractive activities such as fishing, hunting and small-scale mining, often in remote areas of the region, specifically upland forests. Wildlife threats and challenging terrain contribute to the perception that forest-related work is inherently "masculine" (Figure 1). As a result, women face restricted access to and use of upland forests, since these areas are framed as a "male-exclusive" domain (MacGregor, 2017).

Figure 1. Spatial access and perceptions of men and women in NRM
Source: Bayi, Inc., Rapid Gender Analysis, 2023

The Bayi study revealed that women's participation and involvement in community activities and organizations are mediated through their husbands, which reinforces traditional gender roles. Men serve as primary leaders and decision-makers, while women, especially Indigenous women, are seen as caretakers of Indigenous knowledge, who protect their ancestral lands and preserve their culture. Unfortunately, Indigenous knowledge protectors and carers are often confined to secondary or supportive roles in the broader NRM framework, with the contribution of women overlooked by most people (Talidong and Toquero, 2020).

The study found that women often carry out the supportive and nurturing tasks of NRM, and that they access and use resources through subsistence farming, handicrafts and cultural practices. Despite this access and use, however, women still face economic barriers due to their limited opportunity to participate in formal markets and their multiple domestic burdens and responsibilities. This reflects broader societal challenges due to policies that transferred welfare responsibility from the state to individuals, further reinforcing economic barriers and the marginalization of women (Resurreccion and Elmhirst, 2008). In addition, the demands of unpaid domestic labour restrict women from taking part in skill development and limit their ability to acquire and use market-relevant knowledge in formal and informal economic activities.

These gendered divisions extend to leadership and decision-making (IUCN, 2020). Despite their active participation in NRM and conservation, women are still excluded from formal leadership positions due to deeply rooted sociocultural norms, economic constraints, and their disproportionate burden of unpaid domestic labour. These barriers reinforce the practice of men being primary decision-makers while relegating women to supportive roles, restricting their ability to shape policies and governance structures. Fleshed out in this study are women's leadership challenges, highlighting the structural obstacles that they face and proposing pathways toward more inclusive and equitable participation in environmental governance.

Barriers to leadership and decision-making

While there is a positive trend of women assuming leadership positions in NRM, their representation remains limited, and their perspectives are not equally valued in decision-making processes. Half of the survey participants felt that women are still not granted equal decision-making power in accessing, controlling and managing natural resources despite their active participation in NRM activities. This highlights the existing structural barriers that women face, brought about by sociocultural norms and the burden of unpaid domestic responsibilities. While the women who participated in the survey serve as community leaders and are actively engaged in NRM, leadership positions are still predominantly held by men. In addition, traditional leadership perceptions, which emphasize masculine traits such as authority and strength, also continue to hinder women's participation.

This imbalance exacerbates economic challenges for women as their unpaid contributions to conservation activities and projects increase without corresponding financial recognition and incentives or corresponding leadership opportunities. Women are generally beneficiaries of NRM, rather than being empowered as

A focus group discussion with the local women from Tayabas, Quezon. Photo: Rafaella Potestades and Amanda Lee Centeno, Bayi Inc.

decision-makers and agents of change; this reinforces the systemic barriers that continue to limit women's agency.

Systemic undervaluation of unpaid domestic labour further restricts women's participation in NRM. The FGDs revealed that societal expectations, coupled with husbands' tendency to undervalue and underestimate domestic responsibilities, add to women's physical and mental burdens. In addition to managing household chores, caregiving and informal jobs like selling and sewing, women also juggle NRM responsibilities. Many survey participants shared that their husbands tend to dismiss their work at home with statements like, "You are practically doing nothing every day," just because they stay home and do not engage in formal employment. This undervaluation fails to consider the time that women spend in balancing household duties, paid/unpaid work, and community involvement, including public service and volunteer activities, and limits their initiative and ability to engage in or take on leadership roles.

Filipino women face an added layer of vulnerability, as they are disproportionately at risk of intimidation, gender-based violence (GBV) and sexual assault, further hindering their access to, control and use of, and participation, leadership and decision-making in NRM (Orias, 2008). According to Global Witness (2023), the Philippines remains one of the most dangerous countries for women environmental defenders; women remain highly vulnerable to militarization, harassment and threats as they work to protect their ancestral lands.

These barriers and inherent risks, including women's precarious working conditions, remain a pressing concern and hinder women from actively participating in NRM. Deep-seated power imbalances heighten women's vulnerability in environmental defence, and the weak enforcement of women's rights further exacerbates these challenges, exposing them to more harm and limiting their opportunities for full and meaningful participation in NRM. Domestic labour and economic constraints also hinder their engagement in leadership, as most NRM initiatives are voluntary and unpaid. Addressing these challenges requires targeted efforts to reduce women's unpaid labour burdens and create sustainable economic opportunities that support their active engagement in NRM.

Pakilepaan: an alternative governance model

To address these systemic barriers to women's full and meaningful participation in NRM, the Indigenous women of Quezon follow an alternative leadership model that is centred on community values and inclusive decision-making: *pakilepaan*. *Pakilepaan* is a Dumagat process of sharing, discussing and reflecting that fosters unity through the creation of safe spaces where elders, leaders and community members can discuss and deliberate on matters affecting their lives. *Pakilepaan* not only provides

A focus group discussion with the local women in Tayabas, Quezon. Photo: Rafaella Potestades and Amanda Lee Centeno, Bayi Inc.

a process to discuss various matters related to NRM and conservation, but also allows women and youth to talk about the other topics that affect their lives. Hence, this model is instrumental in ensuring inclusion. Power structures and systemic issues can be talked over through diplomatic and engaging storytelling and discussion, providing women with opportunities to raise awareness and suggest means of alleviating barriers to leadership and decision-making. The process recognizes women's voices in NRM leadership and decision-making.

Integrating *pakilepaan* in the existing governance structures of NRM could help communities move away from the hierarchical leadership models that continue to marginalize women in NRM, and could allow communities to embrace collective and inclusive leadership and decision-making that values diverse perspectives. Furthermore, prioritizing *pakilepaan* within NRM could help to redistribute leadership responsibilities, allowing women to take on decision-making roles.

Creating spaces where women can freely express concerns, contribute to solutions, and participate in communal discussions empowers them as key actors in environmental conservation (WWF, 2022). Strengthening Indigenous practices within leadership frameworks can also challenge prevailing gender norms and facilitate greater recognition of women's unpaid labour contributions.

The limited representation of women in decision-making — compounded by socio-cultural norms and the multiple roles they are expected to fulfil — reinforces unequal power dynamics and heightens gender-based risks. Overcoming these systemic barriers is essential to ensuring women's safety, leadership and full participation in NRM. By adopting *pakilepaan* as a guiding framework for inclusive decision-making, communities can dismantle gender inequalities and build leadership models that are rooted in shared responsibility, mutual respect and collective well-being.

Conclusion and recommendations

This article highlights the persistent gender biases that shape leadership roles in natural resource management in the Philippines, often marginalizing women and limiting their participation in decision-making. Indigenous women in Real, Quezon, demonstrate that alternative governance models — rooted in inclusivity, collaboration and sustainability — can successfully challenge these stereotypes and create more equitable and effective NRM practices. The concept of *pakilepaan*, which emphasizes dialogue and participatory decision-making, illustrates how safe spaces and inclusive dialogues can serve as a transformative model for achieving environmental justice and sustainable resource management.

Addressing the structural barriers that women face and enhancing their leadership opportunities in natural resource management require a multi-stakeholder approach. Key strategies for fostering inclusive governance and empowering women in NRM include comprehensive research to document gender-specific ecosystem analyses. Such analyses identify and address the distinct challenges that women encounter in various ecological contexts, and help to shape capacity development programmes that strengthen their technical, leadership and advocacy skills.

By prioritizing women's empowerment and capacity building, legal frameworks that consider gender can be reinforced to promote equitable land ownership and ensure women's meaningful participation in governance bodies. This, in turn, can drive the development and enforcement of gender-responsive policies and legal structures.

Furthermore, transformative leadership can be fostered by adopting inclusive governance models, such as *pakilepaan*, to recognize and elevate women's roles in NRM. Participatory leadership approaches that dismantle traditional power structures create a more inclusive and equitable decision-making context for NRM.

By implementing these measures, stakeholders — including government agencies, civil society, the private sector, and Indigenous communities — can collaborate to break down systemic barriers and build a more just, sustainable and resilient natural resource management system that benefits both people and the environment.

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5.3

Transporting cocoa seedlings to the field for transplanting.
Photo: Abraham Mbikozunga

Agroforestry and changing power relationships, Bafwasende, DRC

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Introduction

"These women are surpassing us, men, in good initiatives; they didn't ask us for anything and aren't expecting anything from us to do what they're doing..."

A traditional leader

Agriculture is the main economic activity in African rural areas. It is characterized by a gendered division of labour. Men clear the fields and grow cash crops; women take care of weeding, harvesting and growing food, and market garden crops (Apusigah, 2009; Ferraton and Touzard, 2009). This labour division based on gender stems from multiple factors, including cultural and social beliefs. Certain cultures and traditions, mainly patriarchal ones which consider the man the leader of the woman, tend to limit women's access to land and assign agricultural tasks deemed to require more physical effort (clearing, etc.) to men (Ogunlela and Mukhtar, 2009).

This division of labour between men and women in agriculture reflects the fundamental power relationships in the community and affirms men's hegemony, which was reinforced and even exacerbated by the Belgian colonial system, Christianity, legislation and the rent economy. This resulted in a division of activities between the Europeans, the settlers and the colonized native peoples. The colonized native peoples were responsible for food crops, while the colonizers exclusively grew industrial crops such as cotton (*Gossypium* sp.), rubber (*Hevea brasiliensis*), oil palm (*Elaeis guineensis*), cocoa (*Theobroma cacao*) and coffee (*Coffea* sp.); see Omasombo Tshonda (2020). Perpetuating this colonial legacy, men are reinforced in their patriarchal attitudes and believe that they are the only ones capable of perennial crops and agroforestry.

These social prejudices define the types of power relationships between men and women and are conveyed and internalized through socialization. Some women resign themselves to these prejudices. Women sometimes feel they have have no choice except to participate in perpetuating thought patterns and power relationships that disadvantage them, particularly in economic matters with a gendered division of labour. Treated as auxiliaries, women receive a pittance, even though they contribute greatly to the survival of families, especially in agriculture (Maindo et al., 2024). They sink into poverty and precarity, especially since in most cases their work is unpaid (Raney et al., 2011; Poggi and Waltmann, 2019). They take care of children and elderly parents, sometimes alone, because some husbands leave the villages in search of a better life in the city or in the mining areas.

The national strategy on community forestry promotes inclusive governance of forests in the DRC. This can boost local entrepreneurship, with the goal of improving the livelihoods of forest-dependent peoples. The development of inclusive entrepreneurship could either improve or worsen the relationships between men and women, or reconfigure them. This is the case of the Working Landscapes Programme, Eastern REDD+ and Protection and Conservation of Water and Forest Resources programme, all focused on community forestry in Bafwasende. These programmes promote cocoa-based agroforestry in support of small-scale forest and agricultural producers: men and women. Such efforts may have an impact on the relationships between men and women. This article analyzes the impact of women's involvement in cocoa-based agroforestry on power relationships in the Bafwasende landscape.

Methodology

The study that this article discusses was carried out in the Bafwasende landscape with communities engaged in

Capacity-building in women's entrepreneurship, Bafwazana village. Photo: Théophile Yuma

community forestry. It aimed to improve their livelihoods through providing secure land tenure on forests held by virtue of custom. In addition to documentary research (activity, monitoring and mission reports and Tropenbos DRC archives), data was collected through semi-structured interviews with 52 women involved in agroforestry and four focus groups of 10 to 14 men each. The interviews focused on field acquisition, clearing and maintenance, cultural constraints, profit sharing, etc. The data were processed using statistical analysis to generate graphs and content analysis that explain the observations.

Women's involvement in agroforestry

In the Bafwasende landscape, many people consider the woman as inferior to the man, to whom she should submit. Women face many constraints in Bafwasende's landscape, according to the field investigations.

The weight of traditions and prejudices

Traditions, beliefs and prejudices are among the constraints that hinder women's efforts in agroforestry and affect representation, attitudes and behaviours. These beliefs form a system of values that govern the experiences and thinking of men and women (Maindo et al., 2020).

Restrictive rules

According to the account of certain traditional leaders, a Bafwasende woman's status condemns her to a perpetual ranking that deprives her of land ownership, because land is seen as belonging to the man. A single woman would benefit from the land of her father and/or her brothers only if she is not married or remarried. She would lose her rights to the land of her family by getting married; this is considered as preventing her in-laws from taking advantage of these rights to the detriment of her own family.

Financial and material constraints

Banking coverage in the DRC is very scarce; there are few banks or microcredit institutions. Even if there were any, few women can obtain credit because the bank's conditions are very demanding in terms of repayment guarantees, particularly for real estate (Maindo and Ibanda, 2020).

A disabling educational deficit

The national literacy rate of 77.3% hides disparities between genders and between geographical areas or regions (PNUD, 2017). The territory of Bafwasende is the least literate in the country due to the small number of schools and their distance from villages, and it suffers terribly from this lack of education. Women are the most affected by this problem.

All these constraints are cumulative. The status and role of a woman in this context are proportional to the number of constraints which weigh on her or from which she has freed herself.

Agroforestry women: varied profiles, common destiny

Despite these obstacles, some women have taken up agroforestry, an activity usually carried out by men. These women have very diverse profiles in terms of age, marital status, level of education, professional experience, household size, etc. But their common goal remains to defy social and economic constraints by practising agroforestry. Of 52 women involved in agroforestry interviewed in the Bafwasende territory, 35 are married, seven are divorced, five are single and five are widowed.

Before the programmes began there were no women practising agroforestry or growing perennial crops in the Bafwasende landscape, but there has been an unprecedented engagement of married women in agroforestry (67% of the women surveyed were married). Faced with an increase in household costs, the low profitability of some men's activities (mining, hunting), and the high mobility of men, who leave in search of remunerative employment in cities, women are using agroforestry as an opportunity to contribute to the survival of their households. According to the project's interviews with women, thanks to this participation in agroforestry, they have become increasingly independent.

Of the sample of 52 cocoa plantations, 25 belong exclusively to women and 27 to couples (Figure 1). This increases the social status of women and reflects a shift in power within households and society in their favour. Few single women are engaged in agroforestry as a strategy, so as not to reduce their chances of getting married in a society where an unmarried woman is not looked on favourably.

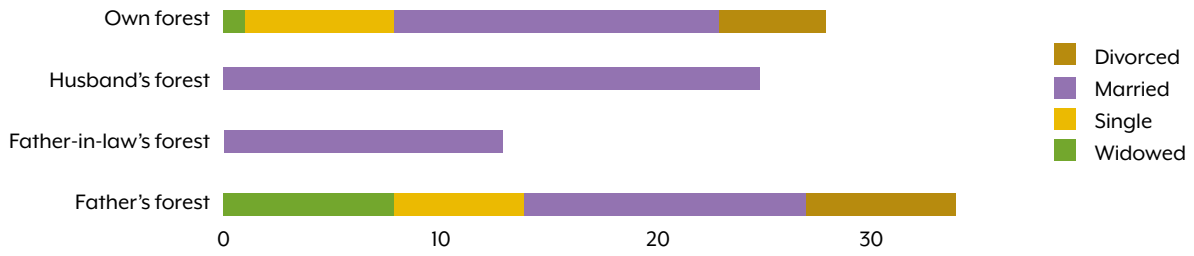

Figure 1. Ownership of forest areas according to the marital status of women

Of the 35 spouses, 24 carry out farming as their main activity, six farm as a secondary activity (because they have another main job), and six do not farm.

The average cocoa plantation area is estimated at 2.5 ha.

Women are increasingly freeing themselves from dependence on land ownership: 27% have acquired their own concessions, but 38% and 35% respectively work on the lands of their husbands or in-laws or their own families. While it was traditionally unthinkable for a woman to have her own land concession, this group of women land-owners, although still small, reflects the shift in power over land.

Intervention strategies and power relationships

Involving, collaborating, diversifying

Women, like other groups such as youth and Indigenous peoples (Pygmies) had always been subject to various restrictions against participating in decision-making, ownership of and access to forest land, etc. (Maindo et al., 2020). The community forestry initiative offered them significant opportunities to break out of the traditional rut to carry out activities formerly monopolized by men.

Overcoming assumptions about jobs reserved for men

Clearing work (field preparation) and field maintenance (perennial crops) require great physical effort. Traditionally, there was a belief that these tasks must be carried out by men. This myth, along with the realities of colonial relations (cash crops for the colonists and food crops for the colonized), reinforced the gendered division of labour in agriculture. The women involved in cocoa agroforestry have been able to circumvent these stereotypes, however (Figure 2).

Because the work of clearing and maintaining agroforestry fields requires a great deal of physical exertion, women traditionally depended entirely on their husbands to carry out these tasks. To overcome this dependence, 57% of the women surveyed recruit local labour or join forces with other women in tontines (cooperatives) to clear the land and 21.5% clear land with their husbands; only 21.5% leave this responsibility to their husbands. For maintenance tasks, 46% of women organize themselves alone or in tontines, 33% involve their husbands in this work, and 10% recruit local labour; only 11% leave this responsibility to their husbands.

Diversifying income-generating activities to support agroforestry

Aware of their lack of means to finance their activities, women have mobilized their will and the knowledge received from various training courses from Tropenbos DRC to materialize their desire to fight poverty.

All the women surveyed combine food and perennial crops and fruit trees in agroforestry plantations, thanks to support from the programmes carried out by Tropenbos DRC.

In addition to agriculture and agroforestry, some women carry out other income-generating activities (IGAs) such as rattan handicrafts, the manufacture of traditional alcohol, and the collection of non-timber forest products (NTFPs). They are also developing collective initiatives such as women's associations with a focus on IGAs. To shorten the time required for clearing or maintenance by one person, tontines and other associations are mobilized for mutual assistance to women in agroforestry. Women from Bafwapada have also created fish ponds and set up an association aimed at supporting women's initiatives in agriculture, fishing, collecting NTFPs and small businesses. Far from being a simple mutual aid initiative, this social engineering implemented by women

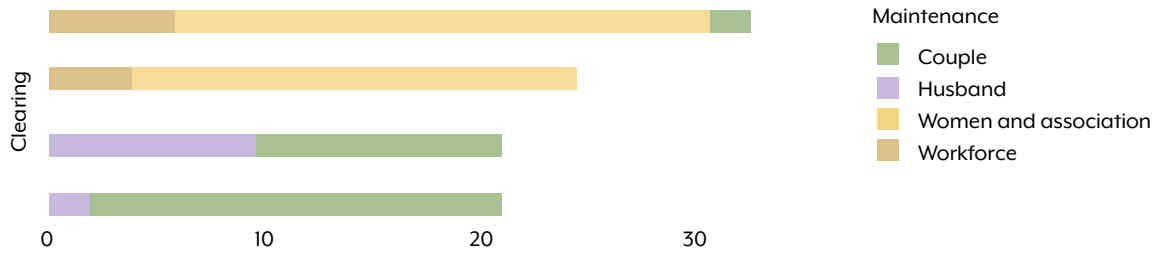

Figure 2. Women's strategies to carry out field clearing and maintenance

to practise agroforestry frees them from local dependence on individual work. It also allows them to participate in productive activities from which they were previously excluded. In addition, it provides employment for men, who are used as local labour; this helps to overcome attitudes that underestimate women and allows women to negotiate on equal terms with men.

In this landscape, the inventiveness of women sometimes surprises men. marvel at the women's prowess and encourage them to thrive. A traditional leader said: *"These women are surpassing us, men, in good initiatives; they didn't ask us for anything and aren't expecting anything from us to do what they're doing. They're astonishing us..."* Some people even think that the frequency of divorce decreases once women start to engage in agroforestry.

Integration of women into management bodies

During the establishment of the governance bodies of the Forestry Concessions for Local Communities (CFCLs), women did not remain powerless. They managed to gain representation within the management groups that pilot the 12 CFCLs already in place. Each CFCL has the following bodies: community assembly, local management committee, monitoring and control committee, and council of elders. Of the 306 elected members, there are 70 women; they represent 23% of the total. Women have their greatest representation within the local management committees, with 31% of the total. This committee plans and executes all daily activities; it comes into contact with all partners. In one of the forest concessions, a woman presides over the community assembly and in another a woman leads the local management committee.

Harvesting cocoa, Bafwapada village. Photo: Meschac Koy

Power relationships and profit sharing

Women assuming responsibilities in CFCLs management bodies and diversifying their sources of income disrupts the traditional balance of power and generates tensions. The women leave the interior courtyard of their household and gradually settle next to a man in the exterior courtyard (*barza*). This change does not occur without discomfort on the part of these actors. Some men still remain reluctant about the community forestry programme because it requires the presence of women at all levels. However, the support of relatives (brothers, children, parents and even spouses) has so far made it possible to avoid a clash in gender relations. A large number of women, however, still hold back. Some of them still fear leaving their traditional role. For them, certain activities and responsibilities are "masculine." They do not speak in public.

Transporting cocoa seedlings for transplanting, Bafwasende Landscape, DRC. Photo: Abraham Mbikozunga

Involvement in the programmes has allowed many women to unleash their potential and their strength. Some men accept that women will participate in these activities. Women's significant participation (31%) within the CFCLs local management committees helps to restructure power relationships between men and women within the landscape.

Increasingly, women involved in agroforestry are also improving their participation in income sharing. During the interviews, some reported controlling between 40% and 80% of the earnings from their cocoa plantations, which improves their level of influence over income management in the household. But, it is currently difficult to determine the share that actually goes to the woman compared to other family members due to the difficulty of deciding whether the share that women receive is a gift by their husbands or a right of remuneration for the service provided.

Conclusion

Agroforestry has become a powerful lever for transforming power relationships in the landscape of Bafwasende. Many women have found in it a way to improve the livelihoods of their households; it also gives them more power and economic autonomy. This shift in power sometimes generates tensions between men and women in this fundamentally patriarchal society. The weakening of the role of men through impoverishment, and the absence of employment opportunities, also favours this progressive change in power relationships between men and women. In this struggle for survival, women in agroforestry have thus managed to acquire a significant share of power in society. The Bafwasende landscape is faced with poor living conditions, precarity and poverty due to several factors. If conditions continue to deteriorate, it can be expected that more women will become involved in agroforestry and will continue to challenge or even reverse the balance of power.

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5.4

Workers fertilizing an oil palm plantation in Papua, Indonesia. Photo: Agus Andrianto/CIFOR

Women and equity in the EUDR

Beyond due diligence and risk mitigation

Hanna Linden, Emily Gallagher, Tamara Lasheras de la Riva, Nining Liswanti and Denyse Mello

To benefit women as forest users, forest farmers and smallholder producers, the EUDR must catalyze the business case and economic incentives for creating shared value.

Introduction

The European Union Deforestation Regulation (EUDR) is a trade and environmental policy enacted in June 2023 to reduce deforestation, forest degradation, biodiversity loss, and CO_2 emissions from the production of seven commodities with a high risk of contributing to deforestation: beef, soy, cocoa, coffee, natural rubber, palm oil and wood products. The regulation applies to products placed on the European Union (EU) market or exported from there. It requires companies across the target commodity chains to perform due diligence, trace products to their origin, and ensure that their products in the EU markets are deforestation-free.

The EUDR is a welcome departure from business as usual, holding companies and countries accountable for deforestation in their supply chains (Baffoe, 2023), although there is concern that the EUDR does not

do enough to safeguard against social risks, especially for women, in smallholder-dominated value chains and forest-dependent communities. The Team Europe Initiative on Deforestation-free Value Chains (GIZ, 2023; Team Europe Initiative, 2023) represents a growing consensus among actors working together with stakeholders in producing countries to join efforts and mitigate risks while leveraging the EUDR to realize social sustainability goals. The initiative provides financial and technical support to partner countries to help smallholders prepare for the operationalization of EUDR. The Sustainable Agriculture for Forest Ecosystems (SAFE) project under the Team Europe Initiative identifies opportunities and extends training to local actors to enhance women's inclusion and equity.

This article examines the risks to and opportunities for women, in all their diversity, as forest users, stewards and value chain actors as a result of the EUDR. While concerns often focus on displacing women's forest livelihoods or excluding them from markets, the EUDR could also legitimize and incentivize women's production practices at agriculture-forest frontiers, especially through shade-grown agroforestry. This article examines the EUDR's potential threats to women's tenure security and livelihoods, as well as its possibilities for their legal, technical and market inclusion.

European Union Deforestation Regulation (EUDR)

The EUDR regulates products entering the EU market. To demonstrate compliance with the EUDR, commodities or products placed on or exported from the EU market must fulfil three conditions from EU (EU, 2023), Article 3: a) they are deforestation-free; b) they have been produced in accordance with the relevant legislation of the country of production; and c) they are covered by a due diligence statement, including geolocations of sourcing areas. Operators and traders submitting products to the European market must demonstrate compliance with Articles 3a and 3b through a due diligence statement.

Deforestation in the context of the EUDR refers to the conversion of forested land to agricultural land that occurred from December 31, 2020 to the present. The regulation applies equally to deforestation caused by natural disturbances and by human activities, meaning that forests cleared by natural disasters (such as fire or extreme weather) cannot be converted to agriculture but must be allowed to regenerate naturally. Deforestation-free commodities are those that are not sourced from land that could be classified as forest at any time during the period covered by the regulation. The tracking and

A Kichwa girl carries fruit home, Napo Province, Ecuador. Photo: Tomas Munita/CIFOR

A Kichwa villager cuts down small trees using a machete, clearing an area to sow corn to feed livestock. Photo: Tomas Munita/CIFOR

traceability systems aim to uphold information transfer along supply chains.

The EUDR requires commodities to be produced in accordance with the relevant legislation of the country of production. This includes laws applicable to issues such as land use rights, human rights, Indigenous peoples' rights, environmental protection, labour rights, the principle of free, prior and informed consent (FPIC), and tax, anti-corruption, trade and customs instruments. National governments have a critical role to play in leveraging the EUDR to secure markets for forest-friendly commodities while concurrently supporting their commitments to climate-resilience and avoided deforestation.

The EUDR due diligence process requires operators and traders to complete risk management and mitigation assessments (Article 10, Sections 2c–e). Operators and traders are further responsible for demonstrating how their risk mitigation procedures and measures reduced risk to a negligible level.

Risk assessments are to be completed annually, with data stored for five years and available on request. The EU's The Deforestation Due Diligence Registry is an online tool to support monitoring and streamline the process. SMEs are not required to submit due diligence statements if their products are included in the due diligence statements of downstream actors. Penalties for non-compliance include confiscation of goods, fines on operators' revenues, or exclusion of up to 12 months, or more for repeat offenders, from EU markets.

EUDR-mediated risks to women

The EUDR does not address gender or gender-specific social safeguards. While Article 30 calls for the European Commission and member states to engage with producer countries to address the root causes of deforestation and forest degradation, including poverty, the EUDR itself primarily focuses on regulating trade and due diligence rather than directly addressing social and economic root causes. However, by promoting sustainable practices and enhanced supply chain transparency, the regulation

indirectly encourages improvements in production practices.

Due diligence and risk management can be used as entry points for identifying and mediating risks to women in their roles as forest users and smallholder producers, while acknowledging that mitigation is limited by reacting to harm rather than proactively addressing inequality at its roots. Without explicit gender- or equity-responsive approaches and indicators, the EUDR risks reinforcing gender norms that alienate women from their land and resource rights, or worse, exploit their informal and oftentimes invisible labour in deforestation-risk commodity chains. Where national legislation is weak or silent on gender, operators and traders may not be held accountable for mitigating gender-specific risks.

National policies on gender discrimination do not guarantee that the rights of marginalized women will be respected or enforced. Legacies of land grabbing under varied circumstances demonstrate the gap between national policy and harmful acts against Indigenous women and forest-dependent communities.

Women as forest users and forest stewards

Women in forest-dependent communities play an essential role in the conservation and stewardship of forest resources through their gendered livelihood activities, such as gathering firewood and fodder, collecting water, and cultivating and foraging for forest foods and non-timber forest products (NTFPs) (Sunderland et al., 2014). Though this work contributes significantly to forestry and forest value chains, much of it is informal, invisible and vulnerable to land-use change and other shocks (Elias et al., 2024). While women are often seen as protectors of traditional knowledge and forest resources, their ability to balance conservation and production is often limited due to their lack of tenure security and of access to information, technology and finance (Doss et al., 2018).

There are concerns that the EUDR may drive land commodification in favour of zero-deforestation crops, potentially displacing women's food production and forest-based activities, even where FPIC protections apply. Without gender-specific approaches, efforts to formalize and digitalize land use change risk enclosure and leakage, further threatening women's livelihoods.

Women as smallholder producers

Women participate in all stages of deforestation-risk value chains, mostly in informal small enterprises (Ingram et al., 2016). When smallholder women have decision-making power, they often favour agroforestry and other multifunctional systems, intercropping food and cash crops (Gallagher et al., 2020). However, the EUDR may devalue agroforestry by classifying it as agriculture, pushing intensification, monoculture and leakage to non-EU markets.

Land rights remain a complex issue in women's access to and control over the benefits derived from commodity production. The EUDR's prioritization of relevant national laws and local contexts is positive but does not always translate into gender equity. Globally, FAO (2018) estimates that less than 15% of agricultural landholders are women, who are less likely to hold legal tenure, either jointly or individually. Women's landholdings also tend to be smaller, with lower yields due to low inputs.

The EUDR may indirectly exacerbate these inequalities, most significantly through formalization and digitalization requirements. Women smallholders already face challenges accessing export markets; they rely on intermediaries and aggregators and in return receive lower producer prices (Bernal et al., 2022). Traceability poses additional challenges and administrative burden. While the responsibility for due diligence lies with traders and operators, economies of scale favour large enterprises, easing traceability, aggregation and transport costs. Larger companies are better equipped to comply with the EUDR, potentially leading to market elitism (Bager et al., 2021), weakening smallholder bargaining power (Sahan and Fischer-Mackey, 2011), and relegating women producers to informal and non-EU markets or compelling them to transition to commodities that drive deforestation. Traceability support for smallholders exists through various organizations and standards, but has not consistently integrated gender.

Opportunities for inclusion

The SAFE project under the Team Europe Initiative has commissioned several studies to identify legal, technical and market opportunities for smallholders to leverage the EUDR to their benefit.

Legal opportunities

Integrating gender-sensitive indicators in risk assessments, such as human rights risks, is essential for due diligence. Frameworks such as the United Nations Guiding Principles can ensure that gender considerations are fully incorporated. Even without gender-specific criteria, women smallholders and IPLCs can still proactively engage in risk management.

The priority that the EUDR gives to national policies offers civil society more agency in local forums to advance safeguards around land-based investments, FPIC, community rights and gender justice, whereas international frameworks such as the Sustainable Development Goals, the Paris Agreement and the Rio Conventions can drive gender equity and inclusion through top-down policy. The NDC Partnership and FPIC provide foundational support, but their success depends on the strength of country-level implementation. Voluntary frameworks such as REDD+ have shown how gender-sensitive approaches and local consultation can achieve fairer outcomes (UNDP, 2017).

With access to EU markets, other regulations apply, such as the Corporate Sustainability Due Diligence Directive (CSDDD). This requires large companies to identify, prevent, mitigate and account for potential adverse impacts on human rights and the environment in their operations and business relationships. It applies to both EU and non-EU companies that operate in the EU market. The directive is gender-neutral; it cannot address all the gaps in the EUDR, but is a step in the right direction.

Technical opportunities

EUDR proponents are optimistic that smallholders will be able to leverage its data requirements to their benefit (EC, 2023). The Team Europe Initiative/SAFE have dedicated significant resources to sensitize smallholders about data inputs at the farm level, developing guides and training videos to demystify geolocation and farm boundary mapping, and show how these data are uploaded with Due Diligence Statements (DDSs). As noted above, the Due Diligence Registry exempts SMEs from direct reporting if downstream actors already cover their products. In line with the EU's Open Data Directive, anonymized geolocation data and supplier information will be made publicly available. The hope is that smallholders will not only own the data that is collected about them, but will mobilize it to gain a stronger and more independent position in the value chain, and in turn, receive fairer prices for their products. This could potentially lead to higher incomes and new business opportunities, especially if accompanied by targeted support measures (EC, 2023).

Warren-Thomas et al. (2023) argue that traceability helps smallholders, especially women, by making them more

A family sitting after collecting fuelwood, Central Kalimantan, Indonesia. Photo: Achmad Ibrahim/CIFOR

visible and their farms more accessible to sustainable intensification. Making the most of the public digital infrastructure, however, requires capacity building, sharing and strengthening across scales. Smallholders and SMEs must understand what data is needed, how markets use it, and how to leverage their traceable data to attract social enterprises and niche buyers.

Market opportunities

Access to the EU market allows smallholders to connect with social entrepreneurs, impact investors and consumers who demand social and environmental accountability. Voluntary standards for social safeguards in EU countries offer a market-driven pathway for integrating gender equity and inclusion, moving beyond "do no harm" to more proactive and transformative approaches (Lofts et al., 2021). Smallholders and SMEs can leverage their EUDR-enabled access to markets by partnering with certification bodies with social inclusion standards such as Fairtrade (Gallagher et al., 2020).

However, women producers need practical incentives, and economic operators require investment returns to support traceability. Formalizing business relationships — directly or through intermediaries — will be essential for women's access to markets. Social enterprises can bridge gaps in services, working capital, digital literacy and geolocation data to enhance participation and compliance. Incentives such as premiums for climate-resilient agroforestry or payments for ecosystem services could further support women producers and mitigate the risk of leakage.

The EUDR does not unlock these market opportunities; it will take concerted effort on the part of social enterprises, enabling institutions and initiatives, and women producers themselves.

Recommendations for EUDR readiness

The EUDR will be reviewed every five years with stakeholder engagement, providing multiple opportunities to assess progress and obtain input on how social safeguards, intersectional inclusion and benefit-sharing could better align with the EU's social and environmental sustainability goals. To benefit women as forest users, forest farmers and smallholder producers, the EUDR must catalyze the business case and economic incentives for creating shared value. An example activity for engaging these processes is developing a community of practice supporting shared learning to channel into policy and practice to address these issues and opportunities with relevant stakeholders in partner countries; CIFOR is currently developing a training of trainers to initiate this and prepare landscape actors and smallholders for EUDR operationalization under the SAFE project.

This article identifies opportunities for gender equity and intersectional inclusion through legal, technical and market change pathways:

- Legal empowerment: Smallholders, especially women, need training on land rights, EUDR roles, and due diligence for risk management, while recognizing customary land tenure and Indigenous claims for deforestation-free production.
- Data empowerment: Smallholders must understand how data about them is collected and managed, and must know how they can use digital tools.
- Market empowerment: Smallholders require training in market opportunities for deforestation-free, socially responsible commodities, with strategies to reach buyers who are willing to invest in due diligence. Organizing can help them access sustainable markets and strengthen their position.

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5.5

The women-led Damaran Baru Forest Management Group ranger team involves both women and men. Photo: HAkA

Empowering women-led grassroots groups in Aceh Province, Indonesia

Irham Hudaya Yunardi, Kevin Ramadhan Sandy and Farwiza Farhan

Women-led efforts on the ground have resulted in collective action and inclusion in environmental conservation.

Introduction

This article explores the successes and challenges of establishing women-led groups for sustainable forest management, focusing on Aceh. Communities in Aceh, the westernmost province of Indonesia, have historically utilized *adat* (customary) values for forest conservation (Muslihin and Yani, 2022). Women tend to be on the periphery of forest conservation efforts, focusing on meeting household needs from forest products such as food and water (Suganda, 2024). Despite the social barriers that also exclude women from higher-level decision-making, local organizations such as Forest, Nature and Environment Aceh (HAkA) have undertaken initiatives that led to the emergence of women-led grassroots environmental groups to advocate for environmental conservation. HAkA is an Aceh-based organization focusing on the protection of the Leuser Ecosystem in Aceh Province (Figure 1) through community empowerment, policy advocacy,

and forest monitoring. The authors of this article provided technical assistance to the community organizers who implemented the activities in their respective villages.

Empowering women-led forest management groups

This article examines two women-led groups supported by HAkA:

- the Damaran Baru Forest Management Group (LPHD Damaran Baru) in Bener Meriah District; and
- United Women Beutong (PBB) in Nagan Raya District.

Both groups were established to respond to local environmental degradation. LPHD Damaran Baru was the first women-led group that HAkA supported, beginning in 2018 and ending in 2023. Damaran Baru is a village located in the central highlands of Aceh province. The village is located close to the forest that is home to one of the headwaters of the Wih Gile river that flows to the surrounding villages. Understanding the importance of protecting the forest and headwaters, men regularly patrolled key areas to reduce illegal logging activities, and also started to invite women to join them and understand the forest ecosystem. However, in 2015 flash floods swept through the village, destroying homes and temporarily displacing the community members to evacuation camps. People's experiences as a disaster refugee were not equal; large disparities were apparent, especially for the women, such as lack of access to clean water and sanitation. This experience inspired the women to play a more active role in forest protection through restoration and to conduct patrols to persuade illegal loggers and encroachers to leave the forest (Farhan and Sambodho, 2022).

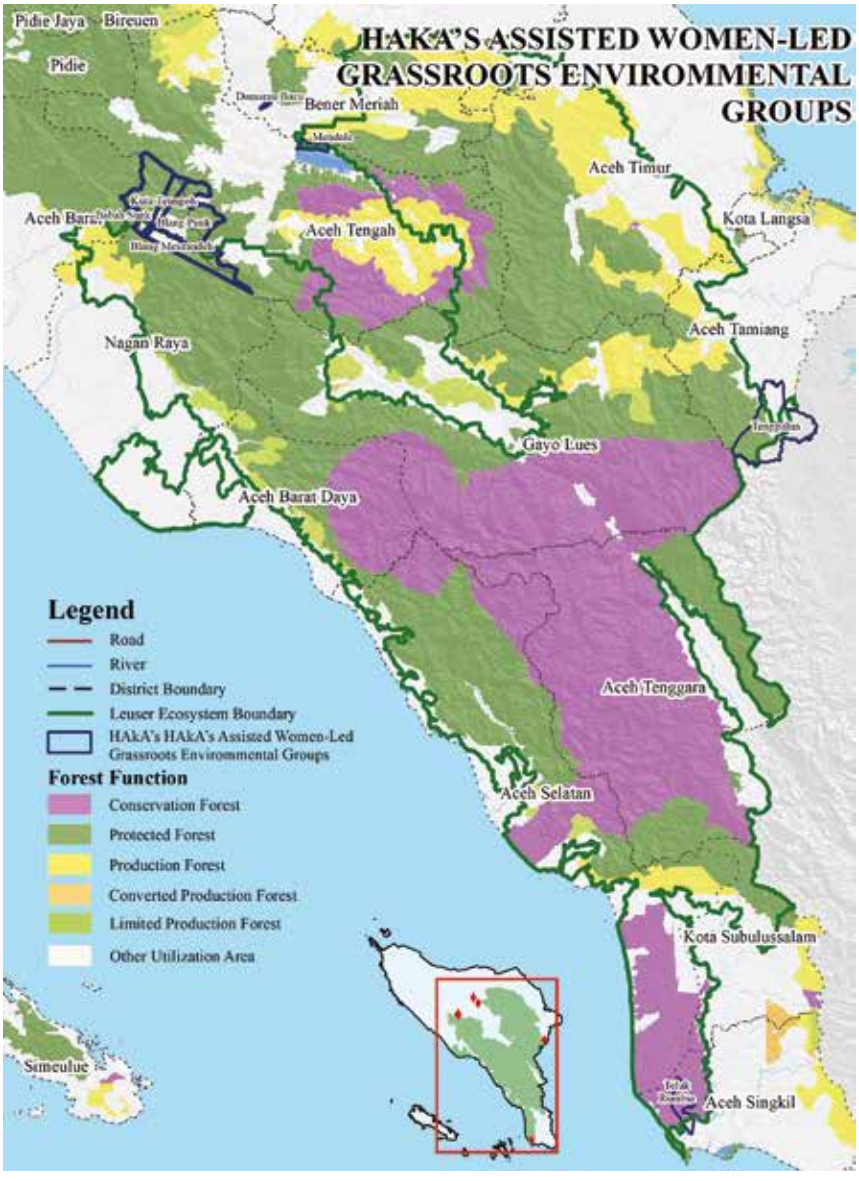

Figure 1. Map of women-led grassroots environmental groups assisted by HAkA
Source: HAkA

HAkA's support for PBB began in 2023 and is ongoing. The women's group comprises communities in Beutong Ateuh Banggalang, a subdistrict in Western Aceh consisting of four villages. The villages are surrounded by pristine forest and are located between two crucial forest areas: the Ulu Masen Ecosystem and the Leuser Ecosystem. The communities made headlines for their protests against PT Emas Mineral Murni, which began gold-mining exploration work in 2018. Although a Supreme Court ruling later annulled the company's permit, the threat of new mining operations loom over the communities. This renewed threat has catalyzed more community-organized protests, and opposition continued with HAkA's initiative to train 50 women in basic paralegal knowledge to assist with their advocacy efforts (HAkA, 2024).

This article highlights how HAkA has applied the learning from its previous experience in Damaran Baru village to Beutong Ateuh Banggalang in order to develop better methods to enhance the resilience of women-led groups. These methods include improved approaches to three different objectives: institutional development of women-led grassroots movements; engaging men as allies; and creating awareness of women's role in conservation.

Approaches

Institutional development of women-led grassroots movements

HAkA first identified the opportunity to strengthen grassroots women-led forest management in 2018 after supporting a group of women in Damaran Baru village by providing a workshop on basic paralegal knowledge. The workshop amplified a common desire among the women to gain management rights over the forest area, and they sought support from HAkA to apply for a social forestry permit; specifically, the Village Forest scheme, from the Ministry of Environment and Forestry. In 2019, after a year of verification and processing, the application was approved and LPHD Damaran Baru became the first women-led community organization to obtain a social forestry permit in Aceh. The group subsequently established the first women-led ranger team in the province, comprising 18 women and 12 men. They patrol the forest area for five days every month. The ranger team members regularly use persuasive methods to engage with potential illegal loggers and instil a

HAkA provided paralegal training for 50 women in Beutong Ateuh Banggalang. Photo: HAkA

sense of responsibility in them to collectively protect the environment (Suhartono, 2023).

The women-led approach was instrumental in building collective action through raising awareness of women-environment relationships within the community. The approach ensured that the development agenda considers the needs of women, while also being willing to compromise by consulting with men to include their concerns. Such compromise rarely occurs in a men-led approach. The women's leadership also played a key role in negotiating for a reallocation of Village Funds to build two rest areas near their restoration sites (Farhan and Sambodho, 2022). Village Funds are allocated by the central government; they comprise approximately IDR 1 billion (USD 80,000) every year to be used for village development, including implementation of social forestry. The Village Funds alone do not support social forestry; it is often funded mostly by HAkA. However, the women's enthusiasm caught the attention of district and provincial governments, resulting in additional financial and capacity-building support.

After three years of strong support from HAkA, the communities expressed their interest in increasing the independence of the group in managing funds and deciding its future direction. This initiative was tested through a sub-grant of IDR 100 million (approximately USD 6,000) from The Asia Foundation, channelled through HAkA. During the process of project management, HAkA provided training and support to empower LPHD Damaran Baru to prepare a satisfactory financial report, as The Asia Foundation had strict financial accountability standards. However, LPHD Damaran Baru perceived these standards as an approach to further control the group's independence, because they deem it unfair that community organizations have to meet those standards. Despite difficulties with this transition, the sub-grant project was implemented successfully, and met the financial accountability standard. LPHD Damaran Baru (who hold the village forest permit for another 30 years) continue to protect their forest area without financial support from HAkA. The group continues to collaborate with HAkA on other efforts, however, such as women forest defender networks and other emerging opportunities.

Similar to the case in Damaran Baru, HAkA's approach to institutionalize the women-led grassroots movement in Beutong Ateuh Banggalang began with basic paralegal knowledge with 50 women from four villages in the subdistrict. Through the paralegal training, the women expressed a wish for further support to establish a women-led group to advocate for forest protection and management, specifically to make the area less attractive to mining companies. They drew inspiration from the previous support of environmental organizations such as the Indonesian Forum for the Environment (WALHI) Aceh, who successfully organized the communities and campaigned for the cancellation of PT Emas Mineral Murni's permit through a lawsuit in the State Administrative Court. The Court ruled against the community, but on appeal their lawsuit was granted by a decision of the Supreme Court. The women, together with HAkA, decided to establish PBB as a foundation instead of pursuing a social forestry permit. This strategy provides the group with more freedom to engage in environmental advocacy to protect their forest, including the ability to file lawsuits.

In respect to traditional wisdom and local knowledge, HAkA supported PBB's initiative to document the communities' environmental knowledge as the basis for advocacy against mining exploration and exploitation. So far, their efforts have focused on documenting stories of the community-nature relationship, as well as recording environmental practices in written format. As with many communities across Aceh, oral tradition is the format in which knowledge is usually transmitted. The group hopes that capturing these stories and practices in written and visual format will strengthen the core mission of the movement while also maintaining the collective memory of environmental advocacy. Furthermore, HAkA continues to strengthen PBB by linking the group to networks of other women-led groups and environmental defenders in the area. Their advocacy work extends beyond protests against mining companies; it also explores the development of community-led ecotourism destinations and other sustainable forest management initiatives.

Engaging men as allies

Women in grassroots groups face myriad challenges to becoming environmental defenders — conservative and patriarchal communities are part of their daily realities (Ernanda, 2023). Each conversation with them was filled with details of their relationship with the environment, along with the pressure of the expectations they face on a daily basis. Furthermore, the women always try to include the men (usually their husband) in their efforts and give them credit for their achievements, in order to maintain broad support for and harmony in their collective mission for forest protection. Educating and empowering women without including the entire community can bring potential disruptions that could be counterproductive to the movement.

That was evident in the case in Damaran Baru. The team members engaged the communities with the assumption that strong, women-led groups could be achieved only with an explicit focus on educating and empowering women. At the beginning, the process was relatively successful. The local communities (men and women) unanimously selected a woman named Sumini, who had previously organized women in the community to plant trees in degraded forest area and engaged with illegal loggers, to lead LPHD Damaran Baru. The group collectively conducted a wide range of activities, such as forest patrols to identify wildlife and plant biodiversity, and explored innovative livelihood opportunities such as honey cultivation. The group's skilful communication and negotiation also increased local understanding of the need for forest protection within the community, while inspiring others.

However, gradually the group faced conflict due to weak organizational management and mismanaged expectations over how to define success. In supporting and celebrating LPHD Damaran Baru, and Sumini as its champion, HAkA failed to understand the perceived contradictions between her role as a leader and as a wife and mother. And although Sumini was democratically elected, and her leadership was vital in engaging and including men to implement activities, HAkA did not address men's expectations about deciding the direction of the organization. The expectations of the men involved in LPHD Damaran Baru, whose wives graced the front cover of newspapers and magazines, eventually played a catalytic role in shifting the group towards organizational independence from HAkA. This shift was also motivated by the wish to secure more power and leverage in the strategic decisions of the organization that related to men.

The experience in Damaran Baru was a hard-learned lesson in the importance of women-led groups engaging with men in the communities. Men should not only be involved with implementing conservation activities, but also in strategic organizational decision-making. This was carefully considered during the formation of PBB in Beutong Ateuh Banggalang. The process of establishing PBB included having Abu Kamil, a man who is a community and religious leader who has organized and held protests for environmental protection, as an advisor to the organization. For the women in the subdistrict, obtaining his approval and having him as an advisor is essential, as Abu Kamil is an influential figure within the communities whom they regularly seek advice from. Abu Kamil's involvement also led the way for other men in the communities to assist women in implementing their ideas, such as documenting environmental knowledge.

Pristine forest in Beutong Ateuh Banggalang. Photo: HAkA

Thus far, PBB is healthy from an organizational management perspective; strategic decision-making considers the input of and feedback from influential leaders as well as other men community members. Although the members of the group are all women, they do not exclude men's voices and they are embedded within the wider communities.

Creating awareness of the movement

HAkA primarily utilized social media platforms such as Instagram, which is popular in Indonesia, as well as connections with journalists, in order to create extensive coverage of LPHD Damaran Baru. The tagline, "The first women-led ranger team in Aceh" garnered major interest from local and international news organizations. The launch of the team took place a few months prior to the COVID-19 lockdown, however, which limited patrols and regular community discussions. Although the lockdown temporarily halted on-the-ground activities, the women's stories were frequently shared through social media, leading to repeated media visits once the lockdown eased and face-to-face contact began again. The extensive media coverage shaped a critical discussion on attitudes about women as change agents in environmental conservation. Although women had been involved in environment and development issues, their importance to environmental concerns became more evident through the work of LPHD Damaran Baru (Qabilla et al., 2024).

The extensive media coverage also led to the group, and Sumini, gaining international recognition. LPHD Damaran Baru received the prestigious Lotus Leadership Award in New York in 2023, and Sumini was named as one of the BBC's 100 Women in the same year (BBC, 2023; The Asia Foundation, 2023). This recognition, which the group deserved, strongly focused on the innovative women-led approach in improving village-based forest conservation, which aimed to be replicated in many countries.
The recognition, however, also led to an unintended consequence: the increased resistance of some of the men in the group. They strongly questioned the coverage and recognition as being a tool for HAkA to gain additional funding, rather than to actually empower the local communities to improve conservation. Although this was suspected by only a few individuals, they were influential in convincing key figures in the group to question HAkA's motives. By that point, it became difficult to reassure people and restore community trust.

Learning from this experience, HAkA opted to not profile PBB and its efforts for women-led forest conservation in social media. Instead, the focus has been to ensure that the group members can develop a strong capacity to manage the organization and carry out collective action. In the process, HAkA has identified key individuals who have the potential to become the spokesperson for PBB, and to be considered for public speaking training in the future. HAkA is more cautious in increasing the recognition of these individuals in order to prevent or mitigate the unintended consequences experienced by LPHD Damaran Baru. PBB has not been significantly covered in the media, apart from occasional quotations used in articles on mining advocacy in Beutong Ateuh Banggalang and on advocacy to improve education in the village. The effort to minimize public coverage was met with a positive response by PBB, who also expressed the importance of developing their presence as an organization before garnering increased recognition.

Conclusion

The process of capacity building over the last five years has provided HAkA with a range of experiences in strengthening women-led groups in Aceh Province, and the opportunity to reflect on what they have learned. HAkA's first experience, with LPHD Damaran Baru, showed the high potential for success for women-led grassroots environmental movements, but also revealed that appreciation for and the involvement of men must also be included. These lessons were applied to HAkA's efforts to strengthen the women-led movement in Beutong Ateuh Banggalang, and have shown positive early results.

Institutionalizing a women-led grassroots movement was sparked by community interest in increasing women's role in environmental conservation and advocacy, namely through paralegal training by HAkA. Women-led efforts on the ground have resulted in collective action and inclusion in environmental conservation. However, it became evident that the communities will desire organizational independence after a few years. Training to manage and develop organizational skills is needed in order not to weaken women-led institutions.

Furthermore, involving men as advisors and supports for women to implement decision-making is crucial. This contributes to harmony within women-led movements and reduces conflicts due to power dynamics. The sole focus on strengthening women individuals in LPHD Damaran Baru was perceived by some men as excluding them from decision-making, despite the women's collaborative engagement with men to implement patrols and explore alternative livelihoods. Early signs from the women-led movement in Beutong demonstrate potential harmony through involving men leaders as advisors, and

obtaining their influence in organizing support from other men.

Social media and news coverage has the potential to change attitudes about women's involvement in conservation. The story of Damaran Baru quickly became well-known nationally and internationally because of the group's tenacity in increasing women's role in conservation, especially in patriarchal societies such as Aceh. However, this resulted in the increased resistance of men, especially since the story was told through the eyes of a third-party organization. Capacity building for communities to be their own storytellers is an important consideration.

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