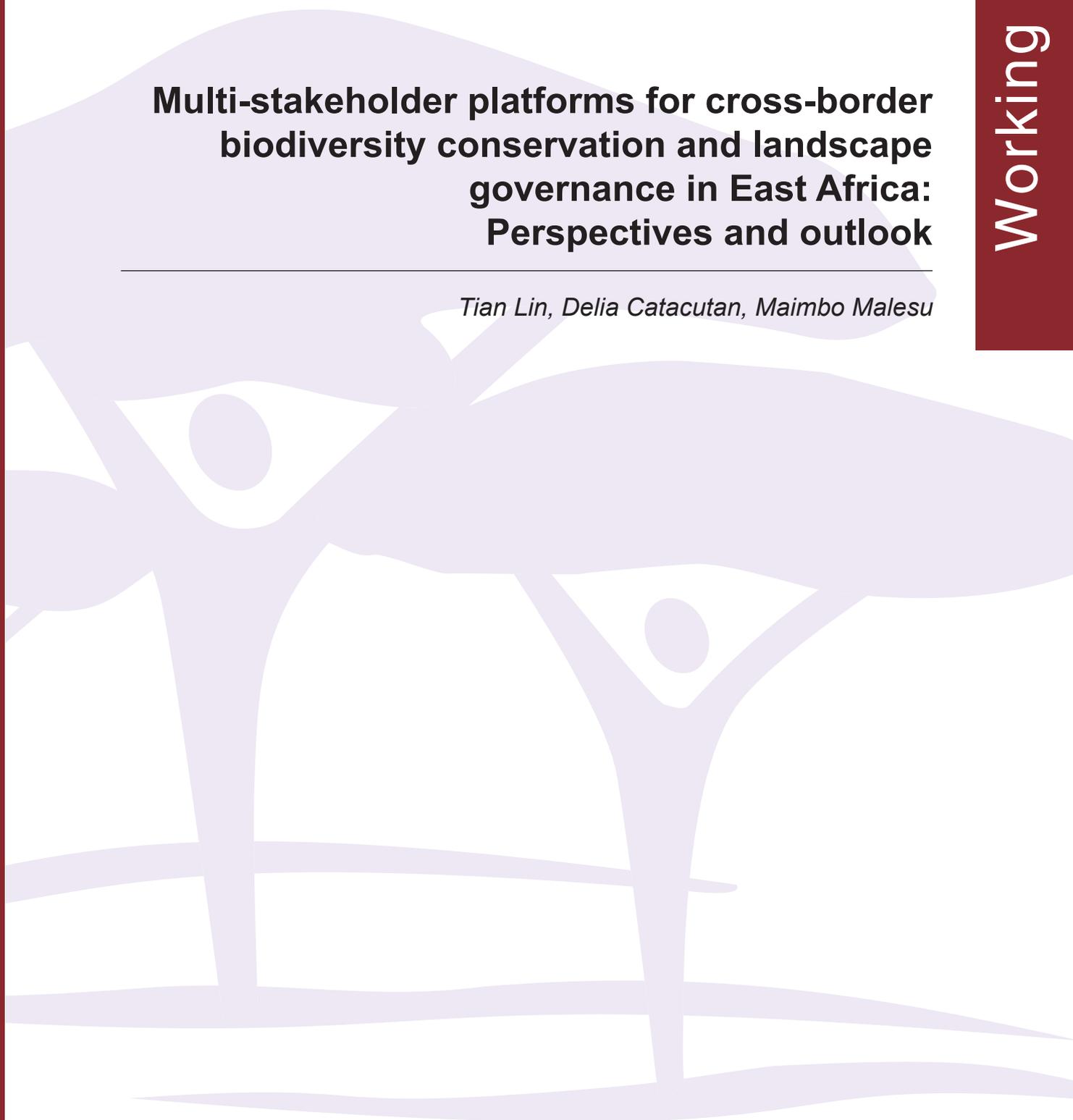


**Multi-stakeholder platforms for cross-border
biodiversity conservation and landscape
governance in East Africa:
Perspectives and outlook**

Tian Lin, Delia Catacutan, Maimbo Malesu



**Multi-stakeholder platforms for cross-border biodiversity
conservation and landscape governance in East Africa:
Perspectives and outlook**

Tian Lin, Delia Catacutan, Maimbo Malesu



Correct citation

Tian Lin, Delia Catacutan, Malesu Maimbo. 2021. *Multi-stakeholder platforms for cross-border biodiversity conservation and landscape governance in East Africa: Perspectives and outlook*. Working Paper No. 322 Nairobi, Kenya: World Agroforestry (ICRAF). DOI: <https://dx.doi.org/10.5716/WP21039.PDF>

Titles in the Working Paper Series aim to disseminate interim results on agroforestry research and practices and stimulate feedback from the scientific community. Other publication series from World Agroforestry include Agroforestry Perspectives, Technical Manuals and Occasional Papers.

Published by World Agroforestry (ICRAF)
United Nations Avenue, Gigiri
P.O. Box 30677 - 00100, Nairobi, Kenya
Phone: + (254) 20 7224000
Via USA phone (1-650) 833-6645

Email: worldagroforestry@cgiar.org
Website: www.worldagroforestry.org

© World Agroforestry (ICRAF) 2021

Disclaimer and copyright

The views expressed in this publication are those of the author(s) and not necessarily those of World Agroforestry (ICRAF). Articles appearing in this publication may be quoted or reproduced without charge, provided the source is acknowledged. All images remain the sole property of their source and may not be used for any purpose without written permission of the source.

The geographic designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of World Agroforestry (ICRAF) concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

About the authors

Tian Lin (MA) is an Environmental Social Scientist who has experience in policy research, project coordination, and monitoring and evaluation. Working in international development, she has supported various donor-funded projects related to biodiversity conservation, landscape restoration, and enterprise development. Tian has led and co-authored peer-reviewed articles, technical papers, and policy briefs on a range of topics including climate change adaptation and agroforestry advice ties in Myanmar, carbon pricing and private timber harvesting in Canada, and a green recovery from COVID-19 in Southeast Asia. At World Agroforestry, Tian engages with the ASEAN Secretariat, working groups, and relevant partners on scaling up agroforestry and provides technical backstopping to the Landscape Partnership Asia initiative.

Delia Catacutan (PhD) is a Principal Scientist at World Agroforestry. Delia has over 20 years of research experience on the technical, social and policy dimensions of agroforestry and integrated natural resources management in Asia and Africa. She has published over 100 peer-reviewed articles, policy briefs, and working papers, and is the lead author of the ASEAN Guidelines for Agroforestry Development. Delia is also a Senior Fellow of the Global Evergreening Alliance and on the Founding Board of the International Union of Agroforestry. She obtained her doctoral degree in Natural & Rural Systems Management from the University of Queensland, Australia, and a post-doctoral fellowship on Sustainability Science at Harvard University's Center for International Development.

Maimbo Malesu (MSc) is an Agricultural Engineer with 32 years of experience managing complex and multi-disciplinary, government and donor-funded programmes and projects implemented at various levels, including sub-national, national, regional, and cross-regional. Alongside his practical experience, he has published over 80 peer-reviewed articles. His research interests are in land and water management, conservation agriculture, soil and water conservation, small and large-scale irrigation and rainwater harvesting. Malesu is the Country Representative of the Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF) for Zambia and also leads the Transformative Partnership Platform (TPP) for optimizing rainwater use in rainfed agriculture in Africa, Asia, and Latin America.

Abstract

This working paper considers the role of multi-stakeholder platforms (MSP) for cross-border biodiversity conservation and landscape governance in East Africa. This paper draws on the MSP literature to assess the challenges and opportunities of using MSPs for managing terrestrial biodiversity resources in transboundary landscapes. Specifically, institutional linkages are investigated alongside success factors for MSP implementation and outcomes through five case examples. We find MSPs to be critical engagement tools in enhancing the fit between institutions and ecosystems that span multiple jurisdictions and sectors. However, we also note several challenges that limit their performance. The analysis suggests the following conditions to support the effectiveness of MSPs: 1) institutional linkages at all levels; 2) skilled facilitation and willingness of stakeholders to share power; 3) strong science-policy linkages; and 4) equitable and sustainable financing mechanisms. While MSPs may help promote species protection in areas devoid of collaborative decision-making processes, there remain research gaps related to the optimal governance structures for, and monitoring and evaluation of MSPs. Addressing these gaps will be fruitful to curb the extinction crisis in the sub-region and beyond.

Keywords

Multi-stakeholder platforms, transboundary conservation, biodiversity conservation, landscape governance, integrated landscape approach, stakeholder participation, East Africa

Acknowledgements and disclaimer

This work was undertaken as part of the CGIAR Research Program on Policies, Institutions and Markets (PIM) led by the International Food Policy Research Institute (IFPRI). This working paper was developed through a literature review of 'multi-stakeholder platforms' in cross-border landscapes in East Africa. Funding for this work was provided by PIM.

The opinions expressed herein belong to the authors and do not necessarily reflect those of PIM, IFPRI or CGIAR.



Contents

About the authors.....	3
Abstract	4
Acknowledgements and disclaimer	5
1. Introduction	7
2. Methods and structure of the paper.....	8
3. Multi-stakeholder platforms for transboundary conservation across East Africa	8
4. Governance interactions, stakeholder participation and success factors	13
The interplay between horizontal and vertical institutional arrangements.....	13
Stakeholder participation, power dynamics and conflict resolution	14
Success factors of multi-stakeholder platforms in multi-level environmental governance	15
5. Outlook of multi-stakeholder platforms	16
References.....	18

1. Introduction

Increasingly, territorially based actors are confronted with the task of engaging in transboundary governance arrangements at various levels and across sectors to influence policies. Among stakeholder engagement processes, multi-stakeholder platforms (MSPs) have increased in popularity to address a range of transboundary issues. Steins and Edwards (1999) define an MSP as a “decision-making body (voluntary or statutory), comprising different stakeholders who perceive the same resource management problem, realize their interdependence in solving it, and come together to agree on action strategies for solving the problem.” MSPs can take various forms, including social networks, focus groups, service or mediation organizations, crisis management platforms, social movements, and co-management organizations (Warner 2006).

In Africa, MSPs have emerged to encourage decentralized decision-making and collaboration among representatives from civil society, government, and the private sector. Specifically, these platforms are seen as viable forums for debate and dialogue in natural resource management, as more evidence supports multi-stakeholder initiatives than stand-alone efforts (Søreide and Truex 2013; Kusters et al. 2018; Reed et al. 2019). For biodiversity conservation, key stakeholders are promoting MSPs to enhance the institutional fit and sustainability of socio-ecological systems. This is in part due to the limited effectiveness of protected areas and the contribution of institutions to conservation outcomes (Oldekop et al. 2010; Schoon 2013).

Institutions constitute a set of agreed formal or informal rules and regulations that support resource management (Ostrom 1990). Since rules and regulations are operationalized within a defined administrative jurisdiction, a mismatch between management units and scales often exists in transboundary landscapes (Bodin 2017). As popularized by Ostrom (1990; 2010) in the conservation field, polycentric governance, which acknowledges multiple centres of decision-making, is a necessary consideration in the provision of a good institutional fit for biodiversity management. In areas with overlapping decision-making bodies, such as transboundary landscapes, MSPs may enable polycentric governance by reconciling the vested interests of different stakeholder groups towards common conservation and environmental goals.

Compared to other regions, Africa faces greater implementation challenges to transboundary conservation due to low institutional capacities and poor governance (Mason et al. 2020). These are complicated by civil conflicts and cross-border disputes, which have resulted in population declines for several species (Beyers et al. 2011; Braga-Pereira et al. 2020). Nonetheless, nature-based tourism, which relies almost entirely on wildlife and protected areas, contributes up to 10% of the regional gross domestic product in East Africa (USAID 2021). Through shared visions among disparate stakeholders, a number of MSPs have been established across this subregion to support transboundary conservation and landscape governance, with varying success.

In this paper, we draw from the MSP literature to assess the role of MSPs in improving transboundary biodiversity conservation and landscape governance in East Africa. We ask:

1. What are the vertical and horizontal institutional interactions within MSPs?
2. How do stakeholder participation, power dynamics, and competing interests affect decision-making and collective action?
3. What are the factors driving successful MSP implementation and outcomes?

2. Methods and structure of the paper

This working paper examines the challenges and opportunities of MSPs for biodiversity conservation, focusing on terrestrial transboundary landscapes in East Africa. Literature searches of peer-reviewed articles, technical papers and briefs from governmental and non-governmental organizations, and credible news media reports were conducted to triangulate data on selected cases. We selected five different cases across East Africa that met the broad definition of MSPs and pertained to transboundary biodiversity conservation and governance in terrestrial ecosystems. From this, we gathered insights on vertical and horizontal institutional linkages affecting the performance and quality of MSPs. Success factors and related monitoring and evaluation dimensions were also identified through this review.

This paper is structured as follows. Section 3 presents an overview of the selected cases, with descriptions of their stakeholder composition, potential contributions and challenges. Using these cases as the backdrop, Section 4 discusses the governance interactions, stakeholder engagement process and success factors of MSPs. It is noteworthy to mention that a single landscape may have multiple MSPs, and as such, the success or failure of one does not necessarily reflect another. Throughout Section 4, we identify lessons learned and the limitations of MSPs. In Section 5, we provide an outlook for MSPs for cross-border biodiversity management and landscape governance in East Africa and beyond.

3. Multi-stakeholder platforms for transboundary conservation across East Africa

About one-third of terrestrial biodiversity hotspots straddle international borders (Vasilijevic et al. 2015). Further, over half of all terrestrial birds, mammals, and amphibians span between national borders and are threatened due to border barriers and uncoordinated management (Mason et al. 2020). Numerous conservation studies suggest that collaborative approaches to managing transboundary landscapes can alleviate the extinction risk of endangered species and help secure local socio-cultural traditions and livelihoods (Kark et al. 2015; Mason et al. 2020). However, much of the analysis on terrestrial biodiversity conservation has focused on the spatial dynamics between wildlife and their environment rather than on the subtle and relational aspects of governance structures and institutions on the ground (Geldmann et al. 2013).

Despite the growth in the number and range of conservation models, such as protected areas and peace parks, data remains mixed on their effectiveness in curbing species

decline (Oldekop et al. 2010; Le Saout et al. 2013). Evaluations of conservation models highlight the importance of institutions in balancing development and conservation goals and mitigating social conflicts for better management outcomes (Oldekop et al. 2010; Schultz et al. 2011). As a means to improve biodiversity management while cutting across traditional boundaries, MSPs and related engagement approaches have been established to provide more appropriate institutional arrangements (World Bank Group 2021). Through these arrangements, several opportunities exist to advance transboundary conservation within and across governance levels and sectors.

Interventions to halt biodiversity loss and foster long-term stakeholder engagement are critical in East Africa, which has one of the world’s highest concentrations of biodiversity (Wei et al. 2018). In their global analysis, Shackelford et al. (2015) found East Africa to be among the top-ranked hotspots for future conservation conflicts, underscoring the urgency of resolving competing interests over biodiversity resources across the subregion. To examine the role of MSPs in transboundary biodiversity conservation, we selected five case examples in East Africa that captured the varying characteristics of multi-stakeholder approaches (Table 1). The locations of these examples include the Serengeti-Mara Ecosystem, Mt. Elgon, the Boma-Gambella Landscape, the Greater Virunga Landscape, and the Eastern Afromontane Biodiversity Hotspot.

Table 1. Case examples of MSPs in transboundary landscapes of East Africa

Location of MSP	Type of actors	Contributions	Challenges	Sources
Serengeti-Mara Ecosystem (Tanzania and Kenya)	Park authorities (Kenya Wildlife Service, Tanzania National Park Authority), non-governmental organisations (NGOs) (Vi Agroforestry, Bunda Farmers Development Support Organization, Fintea Growers Co-operative Union Ltd), local communities, donors (European Union [EU], <i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>)	Inhabitants of the Maasai Mara National Reserve (Kenya) are forming a transboundary protected area (TBPA) with the Serengeti National Park (Tanzania). The Dialogue on the Serengeti - Maasai Mara Ecosystem and Serengeti-Mara Ecosystem Project sought to improve transboundary conservation through	- Weak law enforcement and border control and security issues - High poverty levels, human-wildlife conflicts, human population growth and cross-boundary migration toward protected areas - Resource pressures, resulting in declining water tables, uncontrolled expansion of	Baldus 2005; EU 2019; Veldhuis et al. 2019

	[GIZ]), research and training (College of African Wildlife Management)	empowering local communities	unsustainable tourism development, and illegal poaching and trade	
Mt Elgon (Uganda and Kenya)	Park authorities (PAs) (Kenya Wildlife Service, Kenya Forestry Department, Uganda Wildlife Authority), Mt Elgon County Council, NGOs (International Union for Conservation of Nature [IUCN]), donors (the Norwegian Agency for Development Cooperation [Norad]), intergovernmental organization (East African Community)	Through the Mt. Elgon Regional Ecosystem Conservation Program (MERECP), a TBPA was initiated in 2004 to bring multiple PAs under joint management, with the explicit ambition of being a role model for other transboundary PA networks in East Africa	<ul style="list-style-type: none"> - Local communities have limited influence on the PA governance and TBPA regime and may have less power from implementation - Rights and economic returns of local communities along both sides of the border vary greatly - Personnel of Forest Reserves and National Parks differ in training and resource capacity 	Larsen et al. 2008; Petursson et al. 2011; Petursson et al. 2013
Boma-Gambella Landscape (Ethiopia and South Sudan)	Park authorities (Ethiopian Wildlife Conservation Authority [EWCA]), NGOs (African Parks Network, Horn of Africa Regional Environment Centre and Network [HoA-REC&N], World Conservation Society [WCS],	TFCA initiative, comprised of EWCA and HoA-REC&N, was established to manage, protect, and utilize the Gambella Region. In 2021, IGAD and the EU agreed to support transboundary	<ul style="list-style-type: none"> - Promotion of large-scale agricultural investments in Ethiopia and South Sudan hampers biodiversity protection - Few NGOs aiding conservation in South Sudan, 	Benjamin et al. 2013; Johnson and Vaz 2015; IGAD 2021

	IUCN), research and training (Addis Ababa University), ethnic groups, donor (EU), intergovernmental organization (Intergovernmental Authority on Development [IGAD])	conservation of the Boma-Gambella Landscape, with WCS as the implementing partner	area affected by the refugee crisis and human migration - Political volatility, regional conflicts and periods of insecurity at borders - Human-wildlife conflict, desertification and water insecurity	
Greater Virunga Landscape (Democratic Republic of Congo [DRC], Uganda and Rwanda)	Park authorities (International Gorilla Conservation Programme Institut Congolais pour la Conservation de la Nature, Office Rwandais pour Tourisme et Parcs Nationaux and Uganda Wildlife Authority), NGOs (World Food Programme, WCS), donor (Dutch Directorate-General of International Cooperation)	International Gorilla Conservation Programme (IGCP) – a consortium of conservation NGOs and park authorities – was established in 1991 to foster regional collaboration for the conservation of mountain gorillas. Building on this success, WCS aims to support species tracking through coordinating management within and across institutions of the three countries	- Few incentives to improve species management, mountain gorillas are the only species managed in a regional manner - Region under threat of illegal resources exploitation - Regional conflicts and periods of insecurity obstructs communication - Difficult for local conservation groups to gain political support without external influence	Plumptre et al. 2007; Refisch and Jenson 2016

Eastern Afromontane Biodiversity Hotspot (15 countries)	NGO (Birdlife International, Fauna & Flora International, Rainforest Alliance), donor (l'Agence Française de Développement, Conservation International, EU, the Global Environment Facility, the Government of Japan and the World Bank), research and training (Addis Ababa University), local communities, private sector	Through the Critical Ecosystem Partnership Fund (CEPF), civil societies within countries of the Eastern Afromontane Biodiversity Hotspot were eligible to apply for funding to mainstream biodiversity conservation into government plans and policies as well as private sector initiatives. Many of the grants went toward fostering multi-stakeholder partnerships to enhance biodiversity	<ul style="list-style-type: none"> - Environmental management and conservation not prioritized by local, subnational and national governments, lack of coordination within ministerial departments - Government policies and incentives incompatible with sustainable resource use - Unclear land tenure systems and resource access rights - Civil unrests and political conflicts afflict many parts of the hotspots 	CEPF 2012; CEPF 2015
---	---	---	--	----------------------

The formation of MSPs may be top-down, originating from the initiative of states, bottom-up as a result of grassroots mobilization, or a mix of the two approaches depending on the conservation issue. For example, the Mt. Elgon Regional Ecosystem Conservation Program (MERECP) leans toward a more top-down approach compared to the International Gorilla Conservation Programme (IGCP). While MERECP has political legitimacy through its formal ownership by the East African Community, it often excludes the participation of local Ugandan and Kenyan communities in the conservation of Mt. Elgon (Larsen et al. 2008). Also, although joint management agreements, such as Transboundary Protected Areas (TBPA) or Transfrontier Conservation Areas (TFCA), can provide the foundation for multi-stakeholder engagement, Petursson et al. (2011) found that local communities on both sides of Mt. Elgon had no information about the TBPA initiative.

In the Greater Virunga Landscape, the IGCP was formed as a technical body to protect the habitats of mountain gorillas across the Democratic Republic of Congo (DRC), Rwanda, and Uganda (Refisch and Jenson 2016). Regular meetings were held between

the park wardens and members of the three protected area authorities and only later were high-level government representatives and policymakers involved (Plumptre et al. 2007; Refisch and Jenson 2016). Through a bottom-up approach, cooperation between park wardens was still possible even during political instability (Refisch and Jenson 2016). However, harmonizing laws and policies between the three countries is needed to improve law enforcement (Plumptre et al. 2007).

All MSPs in Table 1 were financially supported by donors and most were initiated by NGOs. Through the Critical Ecosystem Partnership Fund, civil societies were targeted for grants aiming to strengthen their participation in conservation and management of the Eastern Afromontane Biodiversity Hotspot. Various MSPs were created through these grants, often in collaboration with large NGOs (CEPF 2015), which offered potential lobbying influence as seen in the Greater Virunga Landscape. Embedding MSPs within the local institutional contexts and obtaining the buy-in of multiple actors may help prevent donor dependence and contribute to local capacity building (Lim 2016; Ros-Tonen et al. 2018). However, this process faces major challenges due to the prevalence of short-term conservation projects (Ros-Tonen et al. 2018; Reed et al. 2019).

4. Governance interactions, stakeholder participation and success factors

Building on Steins and Edwards' definition (1999), we consider MSP as an umbrella term to describe an institutionalized bargaining space that brings together different stakeholders to improve landscape governance. The rationales for implementing MSPs include alternative dispute resolution, adaptive management, and democratization and empowerment (Warner 2006). Participatory and multi-stakeholder approaches through MSPs have been shown to encourage information access and collaboration for species protection (Lees et al. 2021). However, ensuring inclusive participation and balanced representation becomes more difficult with the involvement of stakeholders across multiple jurisdictions and management units.

The interplay between horizontal and vertical institutional arrangements

Unlike traditional conservation, transboundary conservation requires more commitment among resource users and decision-makers to ensure a functional fit between institutions and an ecosystem. The horizontal interplay, or interactions of institutions at the same level within a system, and vertical interplay, or interactions of institutions across different levels of social and political organizations, take a new and complex dimension as the principle of sovereignty is recognized (Petursson et al. 2013). While not necessary, the involvement of actors at every level of governance is desirable in transboundary multi-stakeholder initiatives to foster ownership and commitment over the long term (Lim 2016). Legal instruments, such as national laws and policies, can articulate the rules within which stakeholders interact and mandate collaboration.

If political commitment and financial support are secured, new institutions may be created to coordinate interventions – yet they are not key determinants to conservation success. Rather, ensuring existing or new institutions are linked horizontally and vertically within and across states is pivotal to enduring success, as argued by Lim (2016). The capacities

of states involved can also shape horizontal and vertical interactions, and thus conservation outcomes. For example, despite similar environmental motives between Ethiopian and South Sudanese stakeholders to conserve the Boma-Gambella Landscape, both countries suffer from weak environmental enforcement (Johnson and Vaz 2015). Unclear and weakly enforced boundaries, armed conflict, and South Sudan's status as the world's youngest nation add to the array of challenges to forging synergies among different levels of institutions, which takes time (Johnson and Vaz 2015).

Moreover, despite their central role in conservation, informal institutions, such as local communities with unwritten but agreed-upon rules, are frequently marginalized in governance processes (Petursson et al. 2011; Ros-Tonen et al. 2013; Sayer et al. 2017). The bias towards formal institutions, such as recognized bodies with codified rules, can widen the gap between realities and expectations. In the Boma-Gambella Landscape, various ethnic groups, as well as many Sudanese refugees, inhabit the transboundary areas, each possessing their own traditional knowledge systems (Johnson and Vaz 2015). More often than not, socio-cultural differences between groups create land and resource disputes, requiring conflict resolution mechanisms. The recent attempt by the Horn of Africa Regional Environment Centre and Network (HoA-REC&N) and the Intergovernmental Authority on Development (IGAD) to develop an MSP in the Boma-Gambella Landscape is promising to promote cross-border biodiversity governance.

Stakeholder participation, power dynamics and conflict resolution

Multi-stakeholder governance arrangements provide flexible decision-making processes for adaptive co-management, which has garnered support from governments, donors, NGOs and other resource users (Schultz et al. 2011; World Bank Group 2021). These processes enable innovation and collaboration among different stakeholder groups to resolve multi-scale resource management dilemmas while countering centralized bureaucracies (Armitage et al. 2009; Sartas et al. 2018). However, power centralization still occurs through MSPs, which may not necessarily inhibit innovation and scaling but can exacerbate power imbalances (Sartas et al. 2018). The dominance of a narrow set of perspectives can create situations where stakeholders begin to outcompete each other for resources, risking the integrity of the platform.

The misuse of power remains rampant in the natural resource sector across Africa, with MSPs having limited anti-corruption effects (Søreide and Truex 2013). Nonetheless, by institutionalizing participation, MSPs may help empower local people to express their concerns and negotiate with others in environmental decision-making (Warner et al. 2006; Reed 2008). This does not mean that power will be equally distributed within the MSP, but rather that the institutional structures of MSPs can foster long-term multi-stakeholder engagement processes if appropriately designed and implemented (Reed 2008). For example, by deploying a boundary-spanning model across pastoral ecosystems of East Africa, including the Serengeti-Mara, Reid et al. (2016) found that awareness of power asymmetries and trust helped sustain relationships to support livelihoods and wildlife conservation, even when funding was exhausted.

Since MSPs do not exist in power vacuums, many practitioners reject consensus-building as it disadvantages minorities by allowing more powerful stakeholders to obtain consensus (Edmunds and Wollenburg 2001; Tengö et al. 2014). Some opt for the shared adversity principle, which recognizes inherent trade-offs in decision-making (Reed 2008), while others argue for strategic representation, focusing on stakeholder identity rather than consensus (Manzungu 2002). Amid the debate on encouraging collective action through stakeholder participation, a widely held sentiment is that MSPs and actors that constitute them are not neutral and should not be treated as such (Edmunds and Wollenburg 2001; Faysse 2006). The romanticization of multi-sectoral processes can lead to the homogenization of stakeholder groups and further marginalize minorities, hindering the ability of MSPs to level the playing field.

In contrast, the acknowledgement of stakeholder power imbalances can help align multi-stakeholder dialogues with local realities and improve management outcomes through a commitment to collective goals (Gavin et al. 2015; Reed et al. 2019). Scientists working in pastoral lands were able to reduce power asymmetries at the local scale by sharing the power of information with communities in joint processes where they also viewed community members as experts (Reid et al. 2016). In this case, decentralized information exchanges led to greater inclusion of the Maasai community in government policy discussions, highlighting avenues to enhance vertical institutional linkages. Furthermore, power-sharing helps engender trust within MSPs, as stakeholders with less perceived negotiating leverage have more confidence that they can influence decision-making. Through increased trust, conflict resolutions related to conservation issues also become more likely (Redpath et al. 2013; Young et al. 2016).

Success factors of multi-stakeholder platforms in multi-level environmental governance

Owing to the unique characteristics of each conservation problem, the performance and success of MSPs will invariably change across space and time. Success may hinge on the sustainability of the platform but more often than not reflects the results produced by the MSP than its maintenance over the long term (Reid et al. 2016; van Ewijk and Ros-Tonen 2012). Common elements that lead to the success of MSPs for multi-level governance are well noted in the conservation literature (Markopoulos 2012; Garard et al. 2018; Kuster et al. 2018). Although not an exhaustive list, these factors include favourable socioeconomic and political conditions and commitment of individual members; the selection of participants who are conducive to discussions; the effectiveness of facilitators in creating trust; the establishment of vertical and horizontal linkages across all levels; strong leadership; and the existence of a dispute resolution mechanism.

Many of these factors fall within the principles of good governance, which articulates the importance of representation, participation and equity, and accountability and transparency (Kuster et al. 2018; Sartas 2018). Through first clarifying priorities for multi-stakeholder collaboration, stakeholders of an MSP can jointly establish conditions for effective operation (Reed 2008; Kuster et al. 2018). This does not mean that an MSP will be defined by a few singular issues, but rather by collaborating on strategic issues, or

finding common ground, as expressed by Lecuyer et al. (2018), stakeholders can use initial achievements to argue for further collaboration. The IGCP initiative in the Greater Virunga Landscape highlights this process, with participants of the different countries coming together to protect mountain gorillas and now using the platform to support peacebuilding (Refisch and Jenson 2016). These and related successes of MSPs showcase key opportunities for diplomacy and social learning.

Along with the social- and process-dependent success factors, the impact and effectiveness of MSPs may also be measured by their influence on policy changes (Faysse 2006). While science-policy linkages can be critical to the deployment and sustainability of management strategies, attempts to create these linkages have only been partially successful due to the strong ideological and philosophical differences between scientific disciplines (Lim 2016; Reed et al. 2019). The rise in interdisciplinary science and citizen science provides avenues for translating science into action (Pocock et al. 2019). This development includes integrating appropriate conservation measures based on scientific and local traditional knowledge into management strategies to deliver long-term impact (Pocock et al. 2019; Tengö et al. 2021).

With the high transaction costs of multi-stakeholder processes (Kuster et al. 2018), the funding of MSPs is notably linked to their performance. In an analysis of MSPs in Burundi, the DRC, and Rwanda, Sartas et al. (2018) found that organizations that received direct funding were more likely to stay within the network – and the reverse was true for financially strapped agencies. While donor funding can kickstart collaboration, it can also negatively affect participation when the benefits and costs of engagement are not equitably distributed. The increasing role of the private sector in landscape governance may help offset these funding challenges, although other risks related to conflicts of interest and power imbalances are created (Ros-Tonen et al. 2018). Complementing MSPs with other stakeholder engagement processes may be needed to reduce tradeoffs and increase synergies in conservation interventions (Warner 2006; Sartas 2018).

5. Outlook of multi-stakeholder platforms

As more of the world's biodiversity resources are under threat, it is increasingly clear that multi-stakeholder coordination and integrated landscape approaches are critical to resolving the extinction crisis. In light of this, this literature review discussed the role of MSPs in fostering multi-stakeholder and multi-level action for biodiversity management. Focusing on East Africa, this review highlighted the effects of institutional interplay and stakeholder engagement on transboundary conservation while identifying ways to leverage inclusive participation. Literature on this topic has rapidly expanded as more practitioners have published lessons learned. This trend signals the importance of adaptive strategies in transboundary landscapes.

In recent decades, research, donor, and practitioner communities have shifted away from one-size-fits-all solutions and embraced multi-stakeholder processes that are context- and issue-specific. More funding for such initiatives is available, but they often lack the long-term commitment needed to enable transformational landscape changes (Reed et al. 2019). Local governance structures thus remain important to the sustainability and

scale-up of MSPs in the absence of donor support. A mix of top-down and bottom approaches to decision-making may help secure the participation of all concerned stakeholders, including marginalized groups. In this process, stakeholder incentives may need to be carefully mapped out to ensure adherence to good governance principles such as anti-corruption, transparency and accountability.

Despite the achievements of MSPs in fostering cross-border collaboration, many gaps in the literature exist and could benefit from greater research investment. For example, robust scientific evidence on the effectiveness of MSPs for biodiversity conservation is limited (Kuster et al. 2018; Garard et al. 2018), let alone for cross-border issues. More attention on establishing standards for evaluating the success of MSPs is needed. The governance structure and type of MSP endorsed by stakeholders may illuminate patterns of conservation interventions across different landscapes. Investigations into whether MSPs can result in better conservation outcomes and sustain cross-border stakeholder engagement through longitudinal studies and social network analysis may also help reveal the full costs and benefits of MSPs.

While MSPs are not panaceas to environmental problems, the decentralized and participatory decision-making structures of MSPs can be effective for managing transboundary resources. The interdependency of actors and the weakness of many existing governance mechanisms in transboundary areas strengthen the rationale for using MSPs to encourage stakeholder participation and collaboration. Collaboration through MSPs can help distribute knowledge to improve outcomes and provide legitimacy in decision-making on issues involving multi-level actors from local communities, park rangers, to national policymakers (Markopoulos 2012). The participation of state and non-state actors can also have transformative effects on changing people's attitudes to build trust and their capacity to mediate conflicts beyond conservation.

To conclude, MSPs can be pivotal in advancing international and national goals on biodiversity conservation. In transboundary landscapes, MSPs are critical engagement tools to support cross-border dialogue and enable diverse stakeholders across jurisdictions to work towards averting the extinction crisis. We see the multi-stakeholder approach as a way of nurturing conditions for social learning and good governance in highly dynamic socio-ecological systems. Investments in monitoring and evaluation and the methodology of MSPs can help contribute to their performance and provide insights into their overall effectiveness.

References

- Armitage DR, Plummer R, Berkes F, Arthur RI, Charles AT, Davidson-Hunt IJ, Diduck AP, Doubleday NC, Johnson DS, Marschke M and McConney P. 2009. Adaptive co-management for social–ecological complexity. *Frontiers in Ecology and the Environment* 7(2): 95-102.
- Baldus RD. 2005. GTZ-Wildlife Programme Tanzania. Dar Es Salaam, Tanzania: Wildlife Division GIZ. <http://www.wildlife-baldus.com/download/gtz-wpt.pdf>
- Benjamin G, Cummings C and Evangelides E. 2013. *Exploring the effects of land use and land cover change on white-eared kob migration in the Gambella Region, Ethiopia*. Waterville, Maine, USA: Colby College.
- Beyers RL, Hart JA, Sinclair AR, Grossmann F, Klinkenberg B and Dino S. 2011. Resource wars and conflict ivory: the impact of civil conflict on elephants in the Democratic Republic of Congo-the case of the Okapi Reserve. *PloS ONE* 6(11): e27129.
- Bodin Ö. 2017. Collaborative environmental governance: achieving collective action in social-ecological systems. *Science* 357(6352).
- Braga-Pereira F, Bogoni JA and Alves RR. 2020. From spears to automatic rifles: the shift in hunting techniques as a mammal depletion driver during the Angolan civil war. *Biological Conservation* 249: 108744.
- Critical Ecosystem Partnership Fund (CEPF). 2012. Ecosystem profile: Eastern Afromontane Biodiversity Hotspot. Arlington, Virginia, USA: Conservation International.
- Critical Ecosystem Partnership Fund (CEPF). 2015. Midterm Assessment Eastern Afromontane Biodiversity Hotspot September 2012 – February 2015. Arlington, Virginia, USA: Conservation International. <https://www.cepf.net/sites/default/files/eam-midtermassessment-lores.pdf>
- Edmunds D and Wollenberg E. 2001. A strategic approach to multistakeholder negotiations. *Development and Change* 32(2): 231-253.
- European Union (EU). 2020. Serengeti-Mara Ecosystem Project (SEMA). Brussels, Belgium: EU. [https://eeas.europa.eu/delegations/tanzania_en/79749/Serengeti-Mara%20Ecosystem%20Project%20\(SEMA\)](https://eeas.europa.eu/delegations/tanzania_en/79749/Serengeti-Mara%20Ecosystem%20Project%20(SEMA))
- Faysse N. 2006. Troubles on the way: an analysis of the challenges faced by multi-stakeholder platforms. *Natural Resources Forum* 30(3): 219-229.
- Garard J, Koch L, Kowarsch M. 2018. Elements of success in multi-stakeholder deliberation platforms. *Palgrave Communications* 4(1): 1-16.
- Gavin MC, McCarter J, Mead A, Berkes F, Stepp JR, Peterson D and Tang R. 2015. Defining biocultural approaches to conservation. *Trends in Ecology & Evolution* 30(3): 140-145.
- Geldmann J, Barnes M, Coad L, Craigie ID, Hockings M and Burgess ND. 2013. Effectiveness of terrestrial protected areas in reducing habitat loss and population declines. *Biological Conservation* 161: 230-238.
- Intergovernmental Authority on Development (IGAD). 2021. IGAD and EU Join Hands for the Conservation of Biodiversity in the Boma-Gambella Landscape. Djibouti: IGAD. <https://igad.int/divisions/agriculture-and-environment/2608-igad-and-eu-join-hands-for-the-conservation-of-biodiversity-in-the-boma-gambella-landscape>

- Johnson E and Vaz J. 2015. *Human wildlife conflict along the transboundary migration of white-eared kob in and around Gambella and Boma National Parks*. Waterville, Maine, USA: Colby College.
<https://web.colby.edu/eastafricaupdate2015/key-issues-in-ethiopia-2015/chapter-2/>
- Kark S, Tulloch A, Gordon A, Mazor T, Bunnefeld N and Levin N. 2015. Cross-boundary collaboration: key to the conservation puzzle. *Current Opinion in Environmental Sustainability* 12: 12-24.
- Kusters K, Buck L, de Graaf M, Minang P, van Oosten C and Zagt R. 2018. Participatory planning, monitoring and evaluation of multi-stakeholder platforms in integrated landscape initiatives. *Environmental Management* 62(1): 170-181.
- Larsen T, Kamugasha B and Karani I. 2008. Midterm review of Mount Elgon Regional Ecosystem Conservation Programme (MERECP). Norway: UMB.
- Le Saout S, Hoffmann M, Shi Y, Hughes A, Bernard C, Brooks TM, Bertzky B, Butchart SH, Stuart SN, Badman T and Rodrigues AS. 2013. Protected areas and effective biodiversity conservation. *Science* 342(6160): 803-805.
- Lecuyer L, White RM, Schmook B and Calmé S. 2018. Building on common ground to address biodiversity conflicts and foster collaboration in environmental management. *Journal of Environmental Management* 220: 217-226.
- Lees CM, Rutschmann A, Santure AW and Beggs JR. 2021. Science-based, stakeholder-inclusive and participatory conservation planning helps reverse the decline of threatened species. *Biological Conservation* 260: 109194.
- Lim M. 2016. Governance criteria for effective transboundary biodiversity conservation. *International Environmental Agreements: Politics, Law and Economics* 16(6): 797-813.
- Manzungu E. 2002. More than a headcount: towards strategic stakeholder representation in catchment management in South Africa and Zimbabwe. *Physics and Chemistry of the Earth, Parts A/B/C* 27(11-22): 927-933.
- Markopoulos M. 2012. Collaboration and multi-stakeholder dialogue: a review of the literature. Gland, Switzerland: International Union for Conservation of Nature and Natural Resources.
- Mason N, Ward M, Watson JE, Venter O and Runting RK. 2020. Global opportunities and challenges for transboundary conservation. *Nature Ecology & Evolution* 4(5): 694-701.
- Oldekop JA, Bebbington AJ, Brockington D and Preziosi RF. 2010. Understanding the lessons and limitations of conservation and development. *Conservation Biology* 24(2): 461-469.
- Ostrom E. 1990. *Governing the commons: The evolution of institutions for collective action*. Cambridge, UK: Cambridge University Press.
- Ostrom E. 2010. Beyond markets and states: polycentric governance of complex economic systems. *American Economic Review* 100(3): 641-672.
- Petursson JG, Vedeld P and Kaboggoza J. 2011. Transboundary biodiversity management: institutions, local stakeholders, and protected areas: a case study from Mt. Elgon, Uganda and Kenya. *Society & Natural Resources* 24(12): 1304-1321.
- Petursson JG, Vedeld P and Vatn A. 2013. Going transboundary? An institutional analysis of transboundary protected area management challenges at Mt Elgon, East Africa. *Ecology and Society* 18(4).

- Plumptre AJ, Kujirakwinja D, Treves A, Owiunji I and Rainer H. 2007. Transboundary conservation in the greater Virunga landscape: its importance for landscape species. *Biological Conservation* 134(2): 279-287.
- Pocock MJ, Roy HE, August T, Kuria A, Barasa F, Bett J, Githiru M, Kairo J, Kimani J, Kinuthia W and Kissui B. 2019. Developing the global potential of citizen science: assessing opportunities that benefit people, society and the environment in East Africa. *Journal of Applied Ecology* 56(2): 274-281.
- Redpath SM, Young J, Evely A, Adams WM, Sutherland WJ, Whitehouse A, Amar A, Lambert RA, Linnell JD, Watt A and Gutierrez RJ. 2013. Understanding and managing conservation conflicts. *Trends in Ecology & Evolution* 28(2): 100-109.
- Reed J, Barlow J, Carmenta R, van Vianen J and Sunderland T. 2019. Engaging multiple stakeholders to reconcile climate, conservation and development objectives in tropical landscapes. *Biological Conservation* 238: 108229.
- Reed MS. 2008. Stakeholder participation for environmental management: a literature review. *Biological Conservation* 141(10): 2417-2431.
- Refisch J and Jenson J. 2016. Transboundary collaboration in the Greater Virunga Landscape: from gorilla conservation to conflict-sensitive transboundary landscape management. In Bruch C, Muffett, C and Nichols SS. eds. *Governance, natural resources, and post-conflict peacebuilding*. Milton Park, Abingdon-on-Thames, Oxfordshire: Routledge. pp 825-842.
- Reid RS, Nkedianye D, Said MY, Kaelo D, Neselle M, Makui O, Onetu L, Kiruswa S, Kamuro NO, Kristjanson P and Ogutu J. 2016. Evolution of models to support community and policy action with science: balancing pastoral livelihoods and wildlife conservation in savannas of East Africa. *Proceedings of the National Academy of Sciences* 113(17): 4579-4584.
- Ros-Tonen MA, Reed J and Sunderland T. 2018. From synergy to complexity: the trend toward integrated value chain and landscape governance. *Environmental Management* 62(1): 1-14.
- Sartas M, Schut M, Hermans F, Asten PV and Leeuwis C. 2018. Effects of multi-stakeholder platforms on multi-stakeholder innovation networks: implications for research for development interventions targeting innovations at scale. *PloS ONE* 13(6): e0197993.
- Sartas M. 2018. Do multi-stakeholder platforms work? PhD Dissertation. Wageningen, Netherlands: Wageningen School of Social Sciences.
- Sayer JA, Margules C, Boedhihartono AK, Sunderland T, Langston JD, Reed J, Riggs R, Buck LE, Campbell BM, Kusters K and Elliott C. 2017. Measuring the effectiveness of landscape approaches to conservation and development. *Sustainability Science* 12(3): 465-476.
- Schoon M. 2013. Governance in transboundary conservation: how institutional structure and path dependence matter. *Conservation and Society* 11(4):420-428.
- Schultz L, Duit A and Folke C. 2011. Participation, adaptive co-management, and management performance in the world network of biosphere reserves. *World Development* 39(4): 662-671.
- Shackelford GE, Steward PR, German RN, Sait SM and Benton TG. 2015. Conservation planning in agricultural landscapes: hotspots of conflict between agriculture and nature. *Diversity and Distributions* 21(3): 357-367.

Søreide T and Truex R. 2013. Multi-stakeholder groups for better sector performance: a key to fighting corruption in natural-resource governance? *Development Policy Review* 31(2): 203-217.

Steins NA and Edwards VM. 1999. Platforms for collective action in multiple-use common-pool resources. *Agriculture and Human Values* 16(3): 241-255.

Tengö M, Austin BJ, Danielsen F and Fernández-Llamazares Á. 2021. Creating synergies between citizen science and Indigenous and local knowledge. *BioScience* 71(5): 503-518.

Tengö M, Brondizio ES, Elmqvist T, Malmer P and Spierenburg M. 2014. Connecting diverse knowledge systems for enhance ecosystem governance: the multiple evidence base approach. *Ambio* 43: 579-591.

United States Agency of International Development (USAID). 2021. Conserving natural capital and enhancing collaborative management of transboundary resources in East Africa. CONNECT Fact Sheet. Washington, D.C., USA: USAID.

<https://www.usaid.gov/east-africa-regional/fact-sheets/connect-fact-sheet>

van Ewijk E and Ros-Tonen MA. 2021. The fruits of knowledge co-creation in agriculture and food-related multi-stakeholder platforms in sub-Saharan Africa – A systematic literature review. *Agricultural Systems* 186: 102949.

Vasilijević M, Zunckel K, McKinney M, Erg B, Schoon M and Rosen Michel T. 2015. Transboundary Conservation: a systematic and integrated approach. Best Practice Protected Area Guidelines Series No. 23, Gland, Switzerland: International Union for Conservation of Nature and Natural Resources.

Veldhuis MP, Ritchie ME, Ogutu JO, Morrison TA, Beale CM, Estes AB, Mwakilema W, Ojwang GO, Parr CL, Probert J and Wargute PW. 2019. Cross-boundary human impacts compromise the Serengeti-Mara ecosystem. *Science* 363(6434): 1424-1428.

Warner JF. 2006. More sustainable participation? Multi-stakeholder platforms for integrated catchment management. *Water Resources Development* 22(1): 15-35.

Wei F, Wang S, Fu B, Zhang L, Fu C and Kanga EM. 2018. Balancing community livelihoods and biodiversity conservation of protected areas in East Africa. *Current Opinion in Environmental Sustainability* 33: 26-33.

World Bank Group. 2021. Collaborative Management Partnerships: case studies. Washington, DC: World Bank. <https://www.worldbank.org/en/programs/global-wildlife-program/publication/collaborative-management-partnership-toolkit>

Young JC, Searle K, Butler A, Simmons P, Watt AD and Jordan A. 2016. The role of trust in the resolution of conservation conflicts. *Biological Conservation* 195: 196-202.

Working paper series

2017

252. Preferensi Petani terhadap Topik Penyuluhan dan Penyebaran Informasi Agroforestri di Indonesia <http://dx.doi.org/10.5716/WP16181.PDF>
253. Seri Agroforestri dan Kehutanan di Sulawesi: Keanekaragaman hayati jenis pohon pada hutan rakyat agroforestri di DAS Balangtieng, Sulawesi Selatan <http://dx.doi.org/10.5716/WP16182.PDF>
254. Potensi dan Tantangan dalam Pengembangan Skema Ko-Investasi Jasa Lingkungan di Kabupaten Buol, Indonesia. <http://dx.doi.org/10.5716/WP17008.PDF>
255. Keragaman Jenis Pohon dan Pemanfaatannya oleh Masyarakat di Kabupaten Buol, Indonesia. <http://dx.doi.org/10.5716/WP17009.PDF>
256. Kerentanan dan preferensi sistem pertanian petani di Kabupaten Buol, Indonesia <http://dx.doi.org/10.5716/WP17010.PDF>
257. Dinamika Perubahan Penggunaan/Tutupan Lahan Serta Cadangan Karbon di Kabupaten Buol, Indonesia. <http://dx.doi.org/10.5716/WP17011.PDF>
258. The effectiveness of the volunteer farmer trainer approach vis-à-vis other information sources in dissemination of livestock feed technologies in Uganda. <http://dx.doi.org/10.5716/WP17104.PDF>
259. Agroforestry and forestry in Sulawesi series: Impact of agricultural-extension booklets on community livelihoods in South and Southeast Sulawesi. <http://dx.doi.org/10.5716/WP17125.PDF>
260. Petani Menjadi Penyuluh, Mungkinkah? Sebuah Pendekatan Penyuluhan dari Petani ke Petani di Kabupaten Sumb Timur. <http://dx.doi.org/10.5716/WP17145.PDF>
261. Dampak Perubahan Tutupan Lahan terhadap Kondisi Hidrologi di Das Buol, Kabupaten Buol, Sulawesi Tengah: Simulasi dengan Model Genriver <http://dx.doi.org/10.5716/WP17146.PDF>
262. Analisis Tapak Mata Air Umbulan, Pasuruan, Jawa Timur. Kajian elemen biofisik dan persepsi masyarakat. <http://dx.doi.org/10.5716/WP17147.PDF> 29
263. Planned comparisons demystified. <http://dx.doi.org/10.5716/WP17354.PDF>
264. Soil health decision support for NERC digital soil platforms: A survey report. <http://dx.doi.org/10.5716/WP17355.PDF>
265. Seri Pembangunan Ekonomi Pedesaan Indonesia: Menanam di bukit gundul: Pengetahuan masyarakat lokal dalam upaya restorasi lahan di Sumba Timur. <http://dx.doi.org/10.5716/WP17356.PDF>
266. Tree diversity and carbon stock in three districts of Kutai Timur, Pasir and Berau, East Kalimantan <http://dx.doi.org/10.5716/WP17357.PDF>
267. Tree Diversity and Carbon Stock in Various Land Use Systems of Banyuasin and Musi Banyuasin Districts, South Sumatera <http://dx.doi.org/10.5716/WP17358.PDF>
268. Tree diversity and carbon stock in various land cover systems of Jayapura, Jayawijaya and Merauke Districts, Papua Province <http://dx.doi.org/10.5716/WP17359.PDF>
269. Modelling tree production based on farmers' knowledge: case for kapok (Ceiba pentandra) and candlenut (Aleurites mollucana) under various agroforestry scenarios. <http://dx.doi.org/10.5716/WP17361.PDF>

270. The Impact of Land Cover and Climate Change on Present and Future Watershed Condition. Study case: Tugasan, Alanib and Kulasihan Sub-watershed of Manupali Watershed, Lantapan, Bukidnon, Philippines. <http://dx.doi.org/10.5716/WP17362.PDF>
271. Tree Diversity and Above-ground Carbon Stock estimation in Various Land use Systems in Banjarnegara, Banyumas and Purbalingga, Central Java. <http://dx.doi.org/10.5716/WP17363.PDF>
272. Agroforestry and Forestry in Sulawesi series: Landscape Management Strategies in Sulawesi: Review of Intervention Options. <http://dx.doi.org/10.5716/WP17364.PDF>
273. Household Food-Security and Nutritional Status of Women and Children in Buol Regency, Central Sulawesi, Indonesia. <http://dx.doi.org/10.5716/WP17365.PDF>
274. Palm oil expansion in tropical forest margins or sustainability of production? Focal issues of regulations and private standards. <http://dx.doi.org/10.5716/WP17366.PDF> 30

2018

275. Decision analysis methods guide: Agricultural policy for nutrition. <http://dx.doi.org/10.5716/WP18001.PDF>
276. Supporting human nutrition in Africa through the integration of new and orphan crops into food systems: Placing the work of the African Orphan Crops Consortium in context. <http://dx.doi.org/10.5716/WP18003.PDF>
277. Seri Pembangunan Ekonomi Pedesaan Indonesia. Pilihan Manajemen Budidaya Kacang Tanah sebagai Upaya untuk Memperbaiki Penghidupan Masyarakat Haharu. <http://dx.doi.org/10.5716/WP18004.PDF>
278. Estudio de línea de base CCAFS a nivel de hogar en Nicaragua y Costa Rica Fase de diagnóstico del estudio: “Contribución de la diversidad arbórea a los medios de vida para la adaptación y la mitigación al cambio climático” <http://dx.doi.org/10.5716/WP18005.PDF>
279. Understanding tree cover transition, drivers and stakeholder perspectives for effective landscape governance. A case study in Na Nhan commune, Dien Bien province, Vietnam. <http://dx.doi.org/10.5716/WP18006.PDF>
280. El Sistema “Quesungual”: Agroforestería y manejo de suelos para la producción de maíz y frijol en laderas. <http://dx.doi.org/10.5716/WP18007.PDF>
- 281: Probabilistic Decision Modelling to Determine Impacts on Natural Resource Management and Livelihood Resilience in Marsabit County, Kenya. <http://dx.doi.org/10.5716/WP18008.PDF>
282. Shifting discourse, shifting power: how is climate change mitigation and justice negotiated in Indonesia? <http://dx.doi.org/10.5716/WP18009.PDF>
283. Result of Land Use Planning and Land Administration (LULA) Implementation in South Sumatra, East Kalimantan, Central Java and Papua <http://dx.doi.org/10.5716/WP18010.PDF>
284. Farmers’ preferences for training topics and dissemination of agroforestry information in Indonesia. <http://dx.doi.org/10.5716/WP18015.PDF>
285. CSA-Diagnostic (CSA-Dx): A primer for investigating the ‘climate-smartness’ of ag-technologies <http://dx.doi.org/10.5716/WP18020.PDF>
286. An analysis of the vulnerability of poor communities in Yunnan Province, China <http://dx.doi.org/10.5716/WP18021.PDF> 31

287. Gendered space and quality of life: gender study of out-migration and smallholding agroforestry communities in West Java Province, Indonesia.

<http://dx.doi.org/10.5716/WP18024.PDF>

288. Evaluation of UTZ certification coffee businesses in Guatemala, Honduras and Nicaragua. <http://dx.doi.org/10.5716/WP18028.PDF>

289. Agroforestry species of Peru: annotated list and contribution to prioritization for genetic conservation. <http://dx.doi.org/10.5716/WP18029.PDF>

290. Indonesia Rural Economic Development Series. Growing plants on a barren hill: local knowledge as part of land restoration in Sumba Timur, Indonesia.

<http://dx.doi.org/10.5716/WP18030.PDF>

291. Assessing the Downstream Socioeconomic Impacts of Agroforestry in

Kenya <http://dx.doi.org/10.5716/WP18033.PDF>

2019

292: Los árboles fuera del bosque en la NAMA forestal de Colombia. Elementos conceptuales para su contabilización. <http://dx.doi.org/10.5716/WP19002.PDF>

293: Gender and Adaptation: An Analysis of Poverty and Vulnerability in Yunnan, China. <http://dx.doi.org/10.5716/WP19004.PDF>

294: Tree Cover on Agricultural Land in the Asia Pacific Region.

<http://dx.doi.org/10.5716/WP19005.PDF>

295: What do we really know about the impacts of improved grain legumes and dryland cereals? A critical review of 18 impact studies. <http://dx.doi.org/10.5716/WP19006.PDF>

296: Breeders' views on the production of new and orphan crops in Africa: a survey of constraints and opportunities. <http://dx.doi.org/10.5716/WP19007.PDF>

297: Biomass Resources in Rhino Camp and Imvepi Refugee Settlements and the Buffer Zone around these Settlements in West Nile, Uganda.

<http://dx.doi.org/10.5716/WP19031.PDF>

298: Option for restocking woody biomass in refugee-hosting areas: Perspectives from communities in Rhino Camp and Imvepi Settlements, Uganda.

<http://dx.doi.org/10.5716/WP19032.PDF>

299: Restoring ecosystems in refugee settlements using tree-based systems: The case of Rhino Camp and Imvepi Settlements in Uganda.

<http://dx.doi.org/10.5716/WP19033.PDF>

300: A theory-based evaluation of the Agroforestry Food Security Programme, Phase II in Malawi (AFSP II): Lessons for Scaling Up Complex Agronomic and Natural Resource Management Practices Developed and Tested in Research Settings.

<http://dx.doi.org/10.5716/WP19036.PDF>

301: Fuentes semilleras y especies agroforestales de los bosques secos tropicales del norte del Perú: estado actual y prioridades futuras. (Spanish)

<http://dx.doi.org/10.5716/WP19057.PDF>

302: Seed sources and agroforestry species of tropical dry forests of northern Peru: current status and future priorities. (English) <http://dx.doi.org/10.5716/WP19058.PDF>

303: Turmeric Production under Shade Management and Fertilization in Degraded Landscapes of Sumba Timur. <https://dx.doi.org/10.5716/WP19066.PDF>

2020

- 304: From Tree Planting to Tree Growing: Rethinking Ecosystem Restoration Through Trees. <http://dx.doi.org/10.5716/WP20001.PDF>
- 305: Agroforestry species of Peru: Reference list and contribution to prioritization for the conservation of agroforestry genetic resources. <http://dx.doi.org/10.5716/WP20013.PDF>
- 306: An exploratory analysis of cost-benefit analysis of landscape restoration. <http://dx.doi.org/10.5716/WP20014.PDF>
- 307: Wood fuel value chains in Kenya: a 20-year synthesis. <http://dx.doi.org/10.5716/WP20026.PDF>
- 308: Especies agroforestales del Perú: Lista referencial y contribución a la priorización para la conservación de recursos genéticos agroforestales. Documento de Trabajo número 308. Centro Internacional de Investigación Agroforestal <http://dx.doi.org/10.5716/WP20041.PDF>
- 309: Simulasi Dampak Perubahan Tutupan Lahan dan Curah Hujan di DAS Citarum Hulu dengan Model GenRiver: Kalibrasi model dan analisa sensitivitas. <http://dx.doi.org/10.5716/WP20048.PDF>
- 310: Simulating the effect of change in land cover and rainfall in Upper Citarum Watershed: calibration and sensitivity analysis of Genriver model <http://dx.doi.org/10.5716/WP20049.PDF>
- 311: Status of Perennial Tree Germplasm Resources in India and their Utilization in the Context of Global Genome Sequencing Efforts. <http://dx.doi.org/10.5716/WP2020050.PDF> 2021
- 312: The one hundred tree species prioritized for planting in the tropics and subtropics as indicated by database mining. World Agroforestry, Nairobi, Kenya. <http://dx.doi.org/10.5716/WP21001.PDF> 33
- 313: Amaruzaman S, Isnurdiansyah B L. 2021. Land-use Land-cover Change and Farming systems in the upland of Pagar Alam City, Indonesia. <http://dx.doi.org/10.5716/WP21007.PDF>
- 314: Effect of COVID-19 on rural community enterprises: the case of community forest enterprises in Cameroon. <http://dx.doi.org/10.5716/WP21007.PDF>
- 315: Assessment of women's benefits and constraints in participating in agroforestry exemplar landscapes. <https://dx.doi.org/10.5716/WP21021.PDF>
- 316: Adoption of improved grain legumes and dryland cereals crop varieties: A synthesis of evidence. <https://dx.doi.org/10.5716/WP21022.PDF>
- 317: Understanding tree-cover transitions, drivers and stakeholders' perspectives for effective landscape governance: a case study of Chieng Yen Commune, Son La Province, Viet Nam. <https://dx.doi.org/10.5716/WP21023.PDF>
- 318: Commune-level institutional arrangements and monitoring framework for integrated tree-based landscape management. Ha Noi, Viet Nam: <https://dx.doi.org/10.5716/WP21024.PDF>
- 319: Beyond carbon sequestration – local knowledge about tree functions. Case study from male and female Arabica coffee farmers in Vietnam . <https://dx.doi.org/10.5716/WP21025.PDF>
- 320: Priority landscapes for tree-based restoration in Ethiopia. DOI: <https://dx.doi.org/10.5716/WP21037.PDF>

321: The Farmland Biodiversity Score for consistent monitoring of biodiversity based on the measurement of trees on farms. DOI: <https://dx.doi.org/10.5716/WP21038.PDF>

World Agroforestry (ICRAF) is a centre of scientific and development excellence that harnesses the benefits of trees for people and the environment. Leveraging the world's largest repository of agroforestry science and information, we develop knowledge practices, from farmers' fields to the global sphere, to ensure food security and environmental sustainability.

ICRAF is the only institution that does globally significant agroforestry research in and for all of the developing tropics. Knowledge produced by ICRAF enables governments, development agencies and farmers to utilize the power of trees to make farming and livelihoods more environmentally, socially and economically sustainable at multiple scales.



United Nations Avenue, Gigiri • PO Box 30677 • Nairobi, 00100 • Kenya

Telephone: +254 20 7224000 or via USA +1 650 833 6645

Fax: +254 20 7224001 or via USA +1 650 833 6646

Email: worldagroforestry@cgiar.org • www.worldagroforestry.org